

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 95-10939
Exam Date: 07/16/2020

1. Current Owner:
TIMOTHY TOPE 132 SUNSET RD ATHOL ID 83801
BEVERLY JOAN TOPE 132 SUNSET RD ATHOL ID 83801
2. Accompanied by: Timothy Tope
Phone No: 208-683-2753
Address: Same as above
Relationship to permit Holder: Permit holder

3. **SOURCE:**
CAREYWOOD CREEK

Tributary
SINKS

Method of Determination: Arcmap and DRG.

B. OVERLAP REVIEW

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

Water Right No.	Source	Purpose of Use	Basis
95-17253	CARYWOOD CREEK	STOCKWATER	DECREED

Comments: 95-17253 is an in-stream stockwater right recently decreed in the CSRBA, with overlapping POU with this right. Due to the in-stream stockwater use, and the fact that this right's storage pond(s) are not used by stock, there is no overlap concerns between 95-17253 & 95-10939.

2. Other water rights with the same point-of-diversion: NO Overlap

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

CAREYWOOD CREEK SW¼ SE¼, Sec. 18, Twp 54N, Rge 02W, B.M. BONNER County

Method of Determination: GPS. POD is a screened 24 inch corrugated pipe located at -116°37.251, 48°01.299.

PLACE OF USE: IRRIGATION STORAGE, WILDLIFE STORAGE, RECREATION STORAGE, and 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	
54N	02W	18															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	
54N	02W	18												13.0			4.9		17.9

Total Acres: 17.9

Method of Determination: Field exam and Arcmap aerial imagery.

3.

Delivery System Diagram Attached (required). Indicate all major components and distances between components.
☒ Indicate weir size/pipe as applicable.

Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be
☒ 1:24,000 or greater.

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

Photo of Diversion and System Attached
☒

4.

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

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
NONE						

2. Measurements: POD incorporates a 24 inch corrugated culvert pipe which diverts Careywood Creek water into a series of ponds with flow through channels. It is an open pipe diversion and no flow measurement was able to be taken. As a result, a Manning Equation was used to derive the flow rate for licensing purposes equaling **0.57 cfs**, which is recommended for licensing this right.

E. FLOW CALCULATIONS

☒ Additional Computation Sheets Attached

Measured Method: see attached Manning Equation calculation worksheet

- Manning Equation = 24 inch diameter pipe with level rise & 10 feet of run (slope = 0.001 ft/ft) = 1.23 cfs. A tape measure was used to determine water level in pipe at time of exam equaling 11 inches, or 46% pipe full.
- Maximum diversion rate = 1.23 cfs (24" pipe full rate) x 0.46 (46% water level in pipe at time of exam) = **0.57 cfs**.

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation: N/A

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 17.9 \text{ acres} \times 3.0 \text{ afa} = 53.7 \text{ af}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = \text{NONE, diversion from storage no irrigation diversion rate applied to license.}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = \mathbf{53.7 \text{ af}}$$

2. Volume Calculations for Other Uses: See three (3) pond analysis worksheets.

G. NARRATIVE/REMARKS/COMMENTS

Administrative note: right 95-18091 was split from right 95-10939 based on having a separate POD & separate POU from three storage ponds associated with 95-10939. Resulting from the split, one POD in the SW¼SE¼, Sec. 18, Twp 54N, Rge 02W, B.M. was removed from this right during licensing review as it was not developed by the applicant; one POD in the SE¼SW¼, Sec. 18, Twp 54N, Rge 02W, B.M. was removed from this right during licensing review as it is covered under 95-18091. Irrigation as a direct flow beneficial use was removed, as all irrigation was occurring from storage.

Field exam performed on 7/16/2020 with the applicant, Timothy Tope, showed an off-stream pond impounding water from Careywood Creek for multiple storage uses and irrigation from storage use. At the POD, the applicant has installed 10 feet of screened 24 inch corrugated pipe to divert water from the creek. It is an open pipe diversion and no flow measurement was able to be taken. As a result, a Manning Equation was used to derive the flow rate for licensing purposes equaling **0.57 cfs**, which is recommended for licensing this right. The diversion rate of 0.57 cfs when combined with the recommended diversion rate for 95-18091 (0.31 cfs) equals 0.88 cfs, which is less than this permit's approved diversion rate of 1.00 cfs; there is no enlargement of diversion rate between 95-10939 & 95-18091 when combined following the splitting of rights.

Photographs of three storage pond(s) POU for irrigation storage, wildlife storage, recreation storage, and fire protection storage were taken during the initial exam and the ponds were full. A follow-up drive by exam was performed on 4/15/2021 to validate water levels in the pipe for diversion rate calculations. During the development of the application, a Department pond analysis sheet was not utilized, resulting in seepage and evaporation volume not being factored into the total annual storage volume. A pond analysis sheet was calculated during licensing review, but is recommended for reference only, as seepage and evaporation rates exceed the combined storage volume between 95-10939 & 95-18091.

Field maps were used to sketch out the three ponds, and during licensing review Arcmap aerial imagery was used to accurately trace out the 3 ponds, which have a total surface area of 0.18 acres, pond capacity of 0.6 af, maximum depth(s) of 4ft/8ft/4ft respectively, and average depth(s) of 1.6ft / 3.2ft / 1.6ft respectively. Seepage and evaporation loss equals 15.4 af combined, but only 3.1 af is being used to derive the total pond volume required limited to **3.7 af** per beneficial use listed above (0.6 af + 3.1 af = 3.7 af). The series of ponds are connected by 24 inch culverts allowing flow through and an overflow channel routes water back to Careywood Creek northeast of pond 3. Mr. Tope asserts that by mid-summer there is almost a back-flow condition from the ponds through the POD to the creek, identifying the creek flow levels become too low to gravity flow into the POD pipe. Based on this information, the diversion rate of 0.57 cfs is likely only achieved during peak runoff months, mitigating concerns for annual creek diversion.

During the exam, the irrigation from storage POU was observed and sketched out on field maps. The applicant uses a 7.5hp pump with poly pipe routed from the pond to a central point located along two large hay fields. There are two irrigation riser pipes, one on each side of a road that separates fields, where additional poly pipe and/or sprinkler hand line is used to route irrigation runs across the field at intervals. In addition to the two large fields, a small area of land is irrigated by frost free hydrant to hose & sprinkler co-located with the ponds. During licensing review, Arcmap aerial imagery was used to accurately trace out the irrigation from storage POU equaling 17.9 acres. The irrigation from storage annual volume equals 17.9 acres x 3.0 afa = **53.7 af**. The maximum diversion volume for licensing purposes equals 3.7 af (multiple storage volume) + 53.7 af (irrigation storage & irrigation from storage multiple fill volume) = **57.4 af**.

Condition 26A was removed from the permit during licensing review. Condition R62 was replaced with R58 to describe no more than 3.0 afa per acre at the field headgate for irrigation from storage use. Condition 220 was updated to reflect the 3ea pond(s) capacity in acre-feet and size in acres. Condition 259 was added describing the 3ea pond(s) volume factors;

53.7 af was added as multiple fill for irrigation storage and from storage use. A text condition was added describing that recreation storage is for boating and swimming. All other conditions on the permit will remain on the license. Overlap concerns: 95-17253 is an in-stream stockwater right recently decreed in the CSRBA, with overlapping POU with this right. Due to the in-stream stockwater use, and the fact that this right's storage pond(s) are not used by stock, there is no overlap concerns between 95-17253 & 95-10939. There are no additional overlap concerns for this water right.

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	01/01 to 12/31		53.7 AF
IRRIGATION FROM STORAGE	04/01 to 10/31		53.7 AF
WILDLIFE STORAGE	01/01 to 12/31		3.7 AF
RECREATION STORAGE	01/01 to 12/31		3.7 AF
FIRE PROTECTION STORAGE	01/01 to 12/31		3.7 AF
DIVERSION TO STORAGE	01/01 to 12/31	0.57 CFS	

Totals: 0.57 CFS 57.4 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

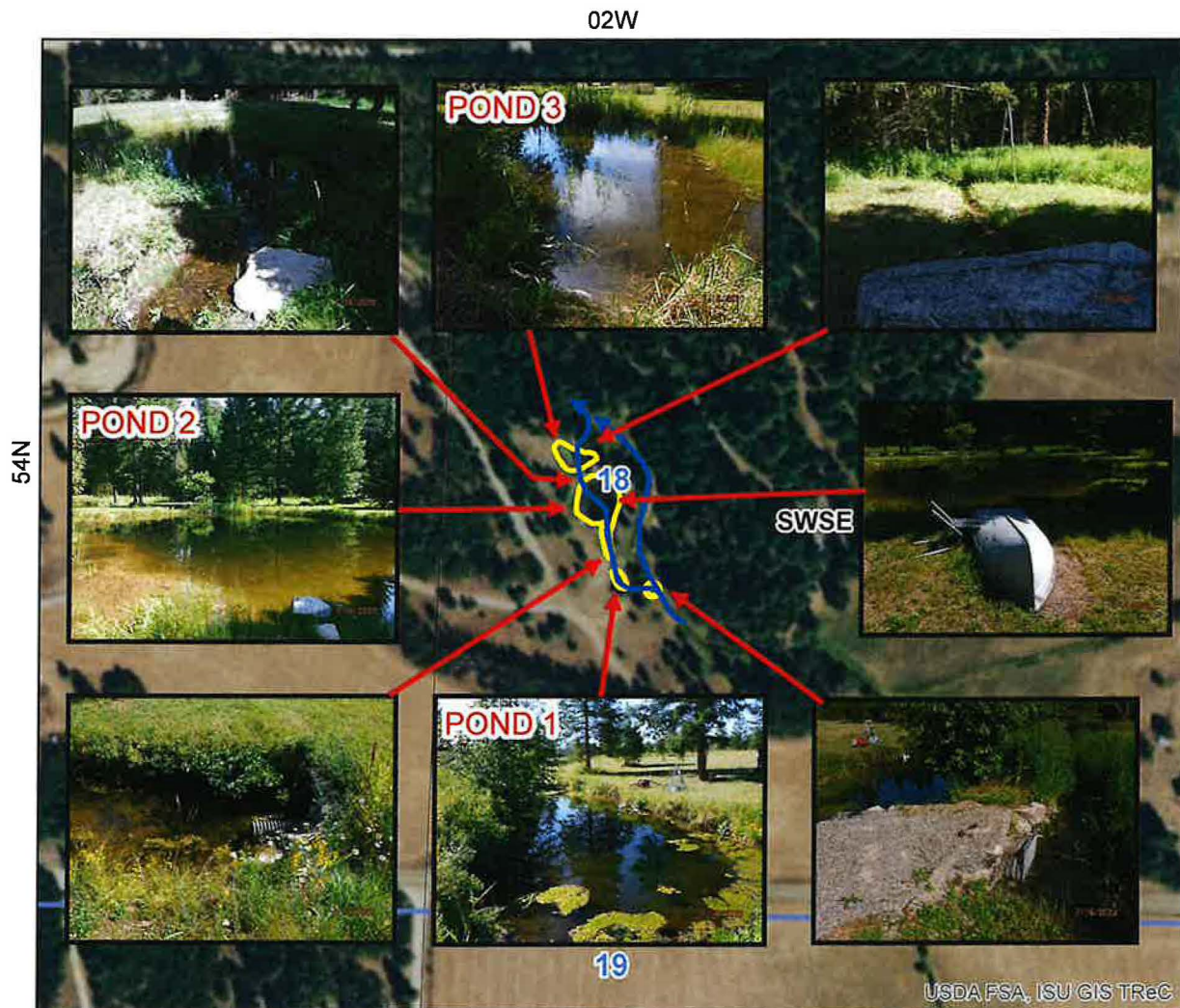
I. AUTHENTICATION Luke Bates - Water Resource Agent

Field Examiner's Name  Date 4/19/2021

Reviewer  Date 8/12/2021

State of Idaho
Department of Water Resources
Attachment to Field Exam
95-10939

IRRIGATION STORAGE, WILDLIFE STORAGE, RECREATION STORAGE,
and FIRE PROTECTION STORAGE system diagram.



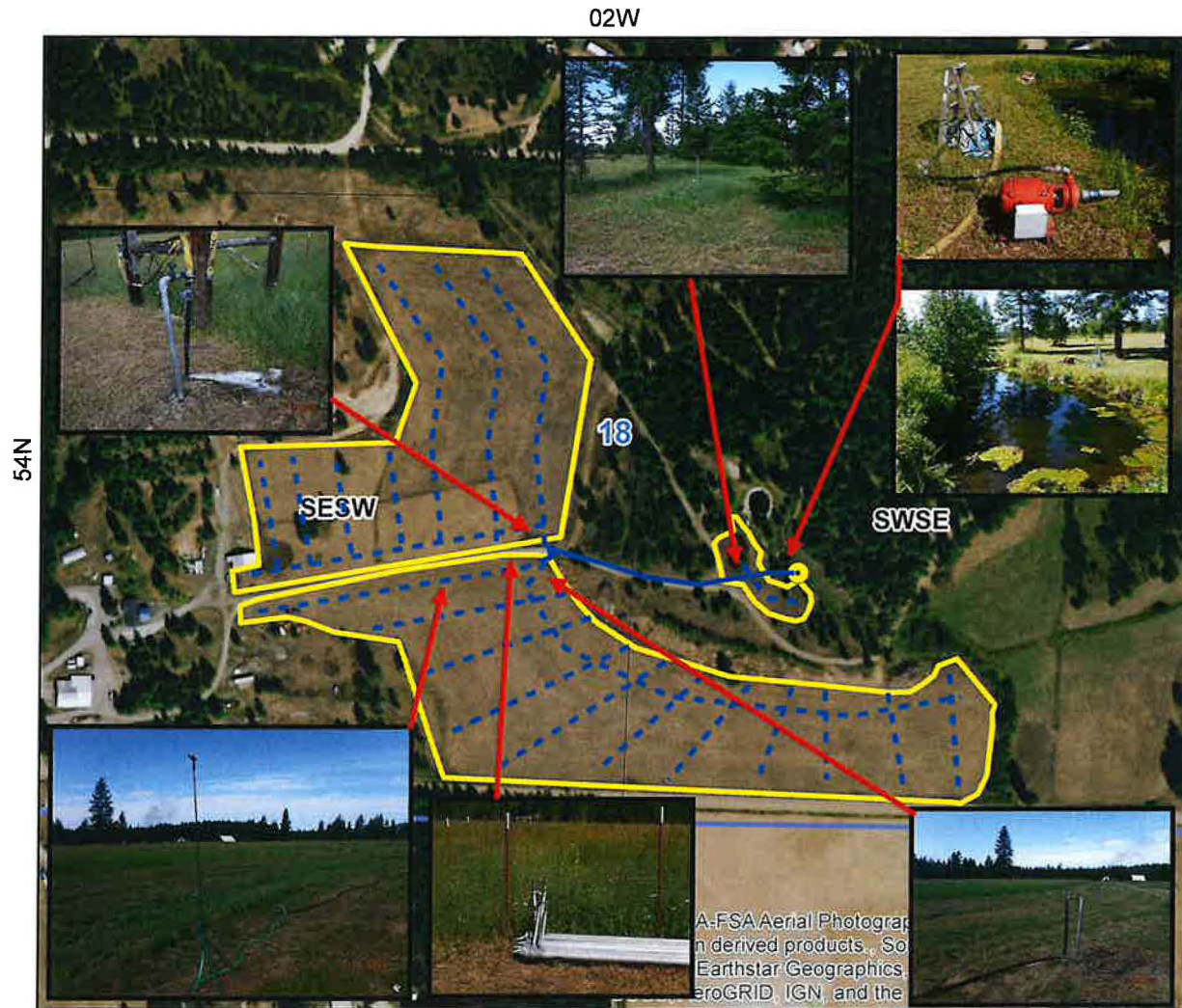
- Point of Diversion
- Place Of Use Boundary
- Townships
- PLS Sections
- Quarter Quarters

0 0.035 0.07 0.14 Miles



State of Idaho
Department of Water Resources
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IRRIGATION FROM STORAGE system diagram.



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

0 0.0475 0.095 0.19 Miles



95-10939 FLOW CALCULATION

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

$S = 0.0001$ ft/ft
 $n = 0.024$ manning's coefficient
 $d = 24.0$ pipe diameter (inches)
 $D = 2.00$ pipe diameter (feet)
 $r = 1.00$ pipe radius (feet)
 $A = 3.14$ area (ft²)
 $WP = 6.28$ wetted perimeter (ft)
 $R = 0.50$ hydraulic radius (ft)

$Q = 1.23$ flow rate (CFS)

Channel Slope

Slope Options

☐ Manual Entry ☒ Slope Calculator

Slope Calculator

Rise = feet
Run = feet
Slope, $S = 0.0001$ ft/ft

Pipe Material, (n):

corrugated metal pipe (CMP)

Pipe Diameter (inches)

24.0 inches

WATER LEVEL IN PIPE AT TIME OF FIELD EXAM EQUALS 11.0 INCHES, WHICH EQUATES TO 46% PIPE FULL. CONSIDERING $Q = 1.23$ CFS UNDER PIPE FULL CONDITIONS, 46% OF 1.23 CFS = **0.57 CFS** CONSIDERING DEPARTMENT ROUNDING STANDARDS.

Total Storage Calculations

FILE NUMBER	95-10939
REVIEWER	LUKE BATES
DATE	4/19/2021

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

POND 1

Surface Area (AC.)	0.01	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	1.6	"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)	0.1	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)	2.9	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	0.0	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	3.1	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.

Total Storage Calculations

FILE NUMBER	95-10939
REVIEWER	LUKE BATES
DATE	4/19/2021

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User Input
Calculated value
Formula Explanations

POND 2

Surface Area (AC.)	0.13	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	3.2	"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)	0.4	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)	9.5	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)	10.0	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.

Total Storage Calculations

FILE NUMBER	95-10939
REVIEWER	LUKE BATES
DATE	4/19/2021

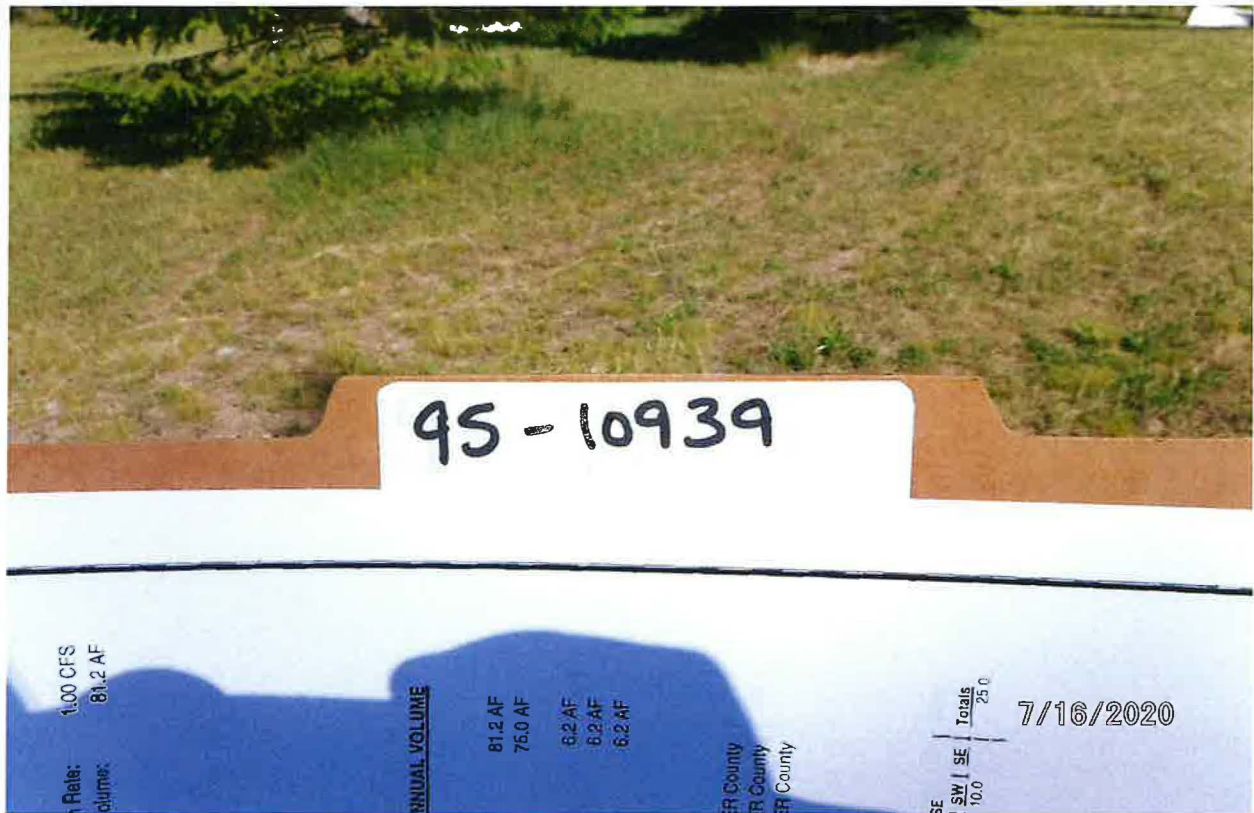
This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total seepage, evaporation and fill capacity required for a pond.

User Input
Calculated value
Formula Explanations

POND 3

Surface Area (AC.)	0.04	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	1.6	"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)	0.1	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)	2.9	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	0.0	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	3.0	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.



FIELD EXAM DATE – 7/16/2020



POD – 24 INCH CORRUGATED PIPE FROM CREEK



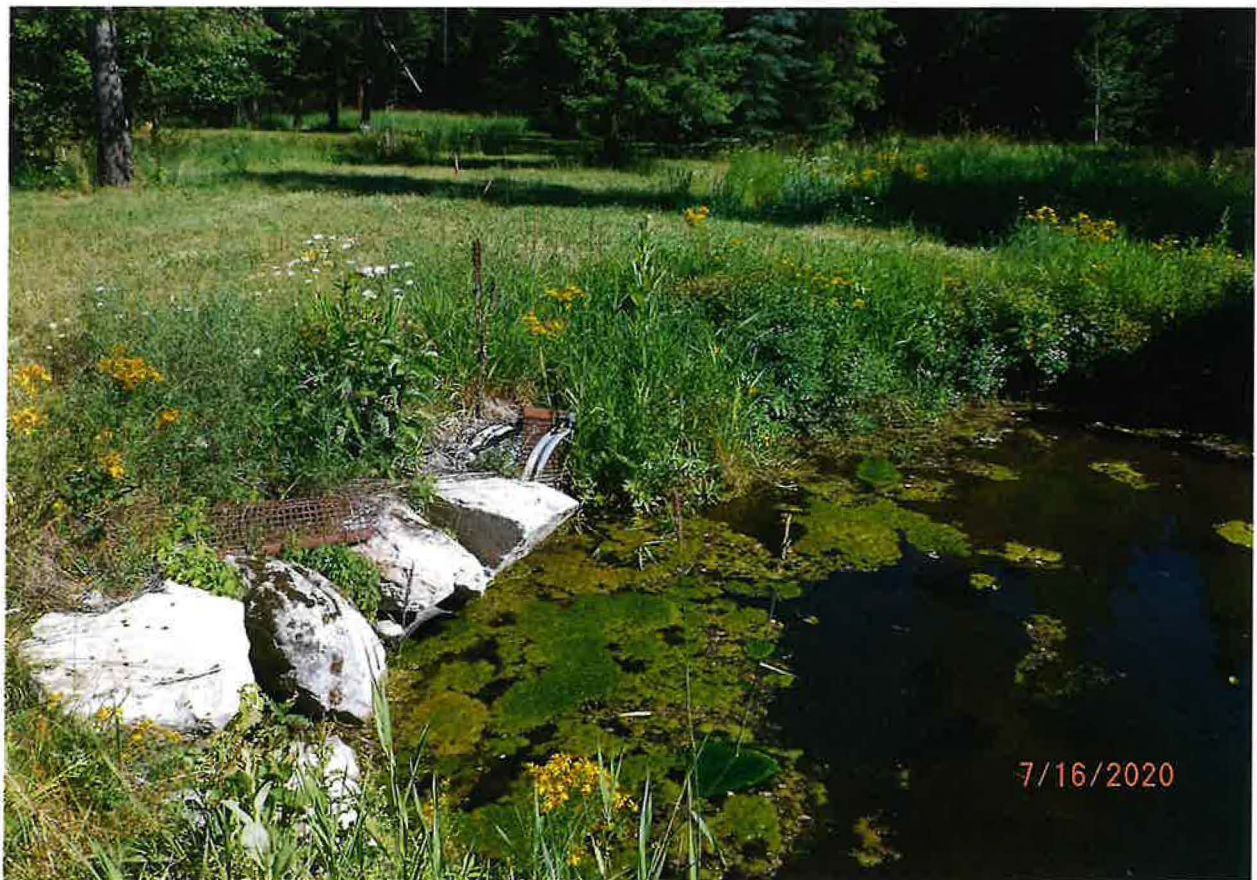
POD – 24 INCH CORRUGATED PIPE FROM CREEK – LOOKING TOWARD POND (4/15/2021)



POD – POND SIDE OF CREEK DIVERSION PIPE (4/15/2021)



POND 1 - IRRIGATION STORAGE, WILDLIFE STORAGE, RECREATION STORAGE, & FIRE PROTECTION STORAGE POU

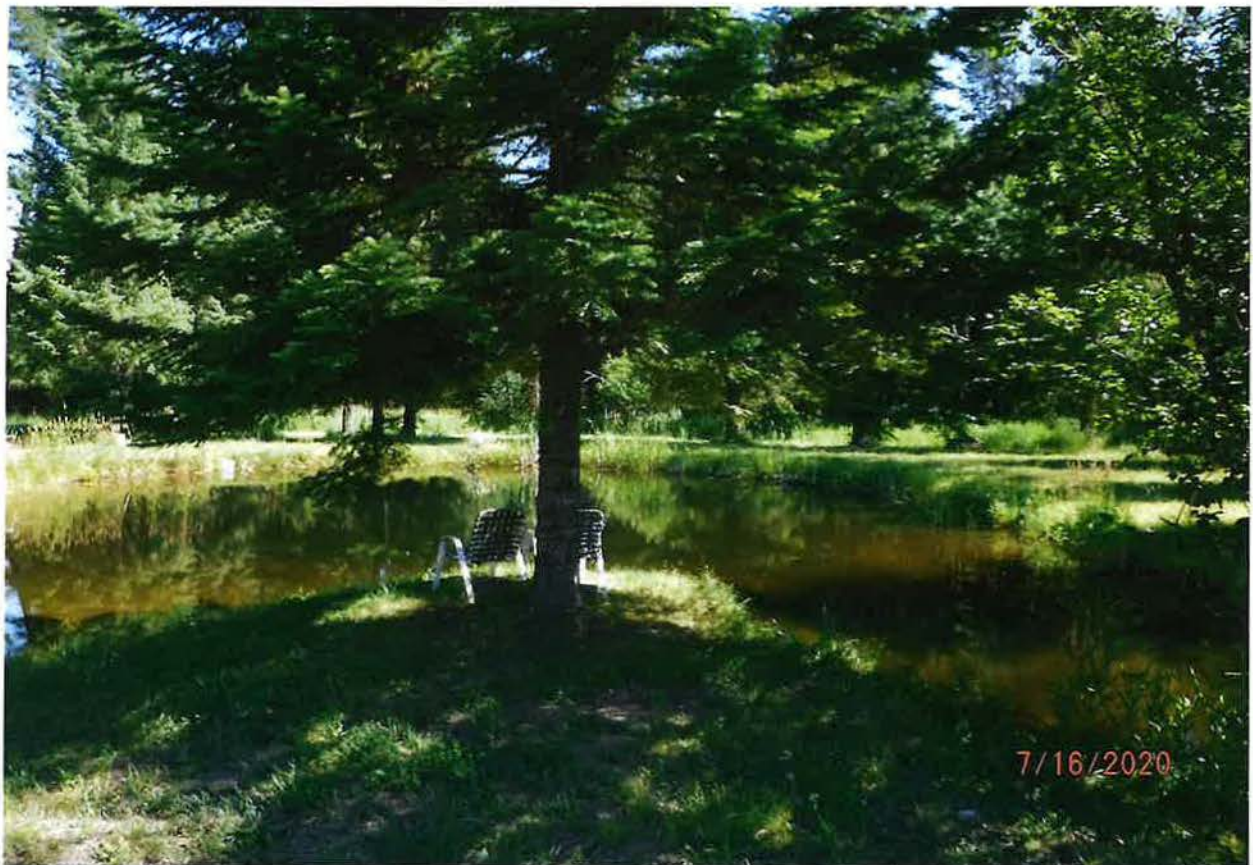


FLOW THROUGH PIPE FROM POND 1 TO POND 2



FLOW THROUGH CHANNEL FROM POND 1 TO POND 2





POND 2 - IRRIGATION STORAGE, WILDLIFE STORAGE, RECREATION STORAGE, & FIRE PROTECTION STORAGE POU





FLOW THROUGH CHANNEL FROM POND 2 TO POND 3



POND 3 - IRRIGATION STORAGE, WILDLIFE STORAGE, RECREATION STORAGE, & FIRE PROTECTION STORAGE POU



OVERFLOW DISCHARGE FROM POND 3 BACK TO CAREYWOOD CREEK





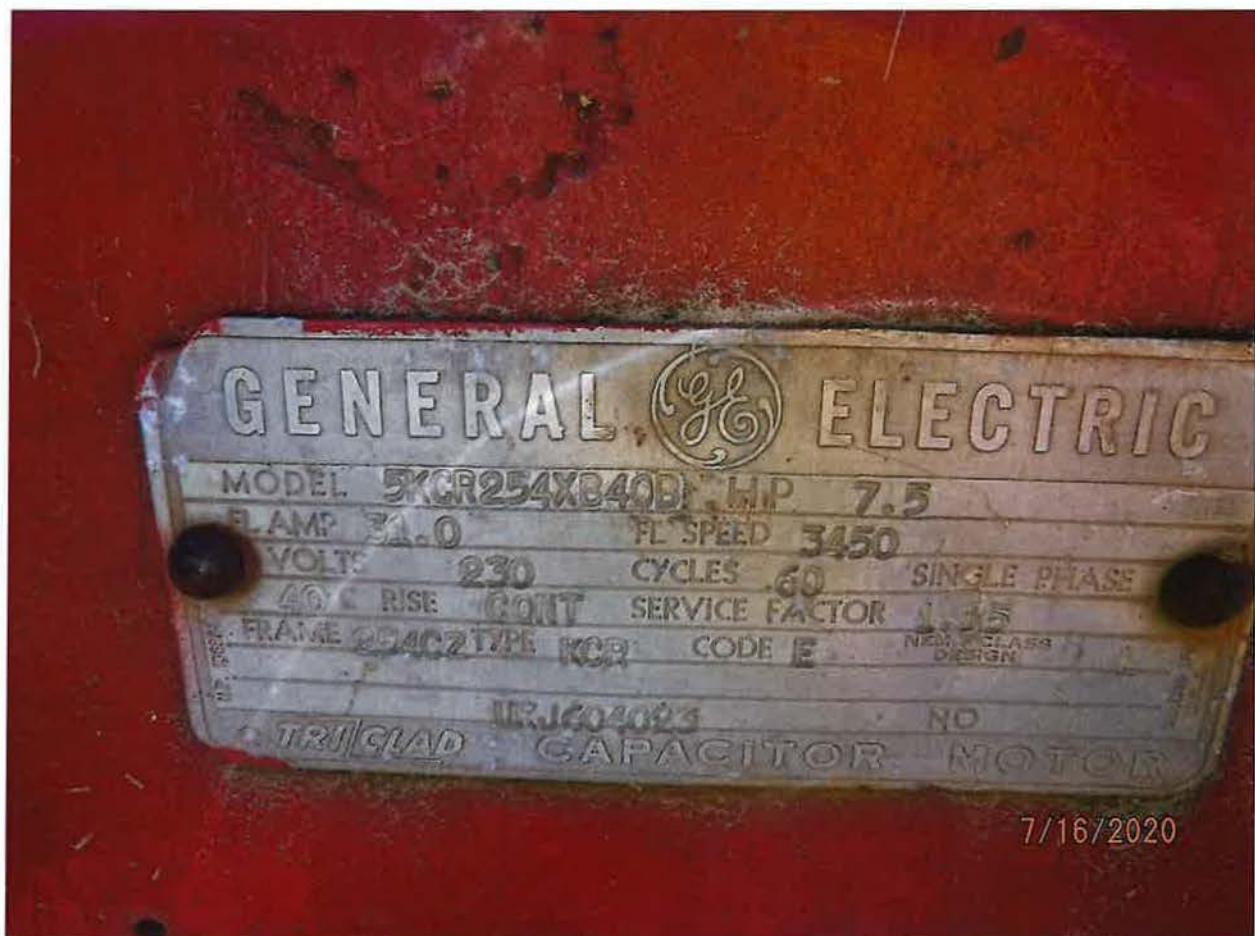
OVERFLOW FROM STORAGE RETURNING TO CAREYWOOD CREEK



IRRIGATION FROM STORAGE CONVEYANCE SYSTEM



7.5 HP PUMP USED ON IRRIGATION FROM STORAGE SYSTEM





IRRIGATION FROM STORAGE POU





IRRIGATION FROM STORAGE POU





IRRIGATION FROM STORAGE POU





IRRIGATION FROM STORAGE (BY PONDS) POU





IRRIGATION FROM STORAGE POU

