

STATE OF IDAHO  
DEPARTMENT OF WATER RESOURCES  
IN-OFFICE REVIEW/BENEFICIAL USE FIELD REPORT

**A. GENERAL INFORMATION**Permit No: **63-32151**Exam Date: **09/05/2019**

1. Does this qualify for an in-office field exam (IDAPA 37.03.02.035.01.r)?     Y   X  N
- Irrigation of 5 acres or less
  - Storage of up to 14.6 AF for stockwater purposes only
  - Any use other than irrigation or storage, if the combined diversion rate is 0.24 cfs or less
  - Other <     >

2. Current Owner: Name: **DAN R HAYES**

Owner of Record Correct?   X  Y     NAddress of Record Correct?   X  Y     N

If No: Address: The physical address for the pond point of diversion is located at 1501 Mace Rd. Eagle, ID 83616. I confirmed this is the physical address with the Water Right owner, Dan Hayes. Therefore, I change the address on the water right to reflect the correct address (1501 Mace Rd). Please also note that water right permit #63-32151 is located within Water District 63.

3. Beneficial Use Fees have been paid:   X  Y     N Receipt No: \_\_\_\_\_

4. **SOURCE****TRIBUTARY**

Groundwater

Boise River

Method of Determination: ArcGIS, Water Right Permit Backfile and Field Examination.Change in Source:     Y   X  N**B. OVERLAP REVIEW**

1. Other water rights with the same place of use:     NO Overlap

| Water Right No. | Source      | Purpose of Use   | Basis   |
|-----------------|-------------|------------------|---------|
| 63-33067        | Boise River | Irrigation       | Decreed |
| 63-33069        | Boise River | Irrigation       | Decreed |
| 63-382B         | Boise River | Irrigation       | Decreed |
| 63-10784        | Groundwater | Wildlife Storage | License |
| 63-11688        | Groundwater | Wildlife Storage | License |

Comments: A review of the property in ArcGIS shows multiple water rights for irrigation from the Mace Catlin Ditch Company (Source: Boise River) which overlap the place of use in the NWSW L5 and in NESE L7. See water right 63-33067 (irrigation) which was split from former water right 63-132 (Transfer 72169). Transfer 72169 authorizes the diversion of water for aesthetic storage in the amount of 3.0 acre-feet to be used for replacement of losses caused by evaporation from one acre total surface area of one aesthetic pond authorized for aesthetic storage under right 63-32151.

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

| Water Right No. | Source | Purpose of Use | Basis |
|-----------------|--------|----------------|-------|
| N/A             |        |                |       |
|                 |        |                |       |

Comments: A review of the property shows no overlapping water rights with the same point of diversion.

**C. DIVERSION AND DELIVERY SYSTEM****1. LOCATION OF POINT(S) OF DIVERSION:**

| Source      | Govt. Lot | 1/4 | 1/4 | 1/4 | Sec. | Twp. | Rge. |      | County |
|-------------|-----------|-----|-----|-----|------|------|------|------|--------|
| Groundwater | 5         |     | NW  | SW  | 17   | 04N  | 01E  | B.M. | ADA    |
|             |           |     |     |     |      |      |      | B.M. |        |
|             |           |     |     |     |      |      |      | B.M. |        |

Method of Determination: ArcGIS, GPS and Field Examination. The point of diversion was left in the NWSW L5 S17 even though the majority of the pond area is located within the bordering section. I positioned the point of diversion in the pond at the north end of the pond, close to where the mitigation pipe from the Mace Catlin Ditch is located and as close to the bordering section line with the NESE L7 S18.

Change in POD?   X   N   Amendment Required?   X   N

**2. PLACE OF USE:** Use: Aesthetic 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 |        |
| 04N           | 01E | 17    |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |        |
| 04N           | 01E | 18    |    |    |    |    |    |    |    |    |    |    |    |    | X  |    |    |    |        |
|               |     | Lot # |    |    |    |    |    |    |    |    |    | L5 |    |    | L7 |    |    |    |        |
| Total Acres = |     |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |        |

Method of Determination: Tax Parcels, ArcGIS, and Field Examination

Change in POU?   X   N   Amendment Required?   X   N

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

  N/A   Indicate weir size/pipe as applicable.

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

  N/A   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 |
|------------------------------------------|------------|----|------------------|-----------|-----------------------------------|
| N/A                                      |            |    |                  |           |                                   |

\*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 |
|-------------------------|------|------|-----------|------------|------|-------------|
| N/A                     |      |      |           |            |      |             |
|                         |      |      |           |            |      |             |

2. Measurements: This field examination was conducted on 9/5/2019. An 8 inch CMP pipe was observed actively delivering water from the Mace Catlin Ditch to the pond, thereby satisfying mitigation requirements per permit conditions. A flow measurement was made using the Timed Volume (bucket fill) method. Results are below in Section E.

**E. FLOW CALCULATIONS**

\_\_\_\_\_ Additional Computation Sheets Attached

Measured Method:

A measurement was conducted using the Timed Volume method. It took 29.0 seconds to fill a 5.0 gallon bucket.5/29 = 0.17 gal x 60 sec = **10.3 gpm.**

**Annual Use Calculation for Mitigation (3.0 AF):** 10.3 gpm x 60 min = 618 gph x 24 hrs = 14,832 gpd x 130 days in the season (actual 260 day season for Mace Catlin Canal but water only flows into pond pipe from canal when canal is full, about half of the irrigation season) = 1,928,160 gpy / 325,851 = Approximately **5.9 AFA**

**F. VOLUME CALCULATIONS**

## 1. Volume Calculations for Irrigation:

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

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

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = \text{N/A}$$
2. Volume Calculations for Other Uses: **Aesthetic Storage**Aesthetic Storage Pond: L x W x D**Estimate:** (L) 250' x (W) 120' = 30,000 ft<sup>2</sup> x (D) 9.6' = 288,000 ft<sup>3</sup> / 43,560 = **6.61 AF**Pond dimensions were confirmed during the field examination and measured with ArcGIS. Pond storage calculations were used for the total storage capacity.According to ArcGIS, the pond surface area is 32,670 square feet (0.75 acres) multiplied by an average depth of 9.6 feet equals 313,632 cubic feet divided by 43,560 equals 7.2 AF of pond capacity.The IDWR Pond spreadsheet calculated evaporation loss of 2.1 AFA. The bottom of the pond was designed to be 24 feet deep (24 ft x 0.4 = 9.6 ft avg depth). The pond capacity was calculated to be 7.2 AF plus the estimated evaporation loss of 2.1 AF equals a total of 9.3 AFA.I am recommending a total volume of **7.2 AFA** for Aesthetic Storage for water right permit 63-32151.**G. PURPOSE OF USE**Irrigation \_\_\_\_ Y \_\_\_\_ **X** \_\_\_\_ N # Stock \_\_\_\_\_ Domestic # of Homes \_\_\_\_\_Other: Aesthetic StorageChange in Purpose of Use? \_\_\_\_ Y \_\_\_\_ **X** \_\_\_\_ NMethod of Determination: Application for Permit, Proof of Beneficial Use Statement, and Field Examination.

If Yes: From Use \_\_\_\_\_ To Use \_\_\_\_\_ Amount \_\_\_\_\_ CFS \_\_\_\_\_ AFA \_\_\_\_\_

**H. NARRATIVE/REMARKS/COMMENTS**

A field examination was conducted on site and a review of the property was conducted in ArcGIS. I relied on pond dimensions measured using ArcGIS which were also used for pond storage calculations. An 8 inch CMP pipe was observed actively diverting from the Mace Catlin Ditch into the pond and is located at the north end of the pond. This provides evidence that mitigation is being provided for evaporation as required by permit conditions. A flow measurement was conducted using the Timed Volume method. The pipe was actively flowing at 10.3 gpm during the field examination. Mitigation is only occurring during times when the Mace Catlin Ditch is running full. I estimated the side slopes of the pond to be 1:1.

The pond location, area, and place of use was verified in the field. There are no overlapping water rights at the point of diversion. There are however, overlapping water rights at the place of use and include irrigation water rights from the Mace Catlin Ditch Company.

The right holder is required by permit conditions to mitigate for the evaporation of water from the pond constructed in connection with this water right by diverting 3.0 acre-feet of water under water right 63-132 into the pond each irrigation season as authorized by Transfer #72169. Water right 63-132 (0.02 cfs) is an existing surface water right as described in the Mace Catlin Ditch Company transfer application #72169. See water right 63-33067 which was split during adjudication from former right 63-132.

This water right permit does not authorize the diversion of water to storage. This water right permit only authorizes the aesthetic storage of ground water, up to 10.0 afa. The right to drill a well is not a part of this permit to appropriate water.

All of the permit conditions shall remain at licensing.

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

**I. RECOMMENDATIONS****1. Recommended Amounts**

| <u>BENEFICIAL USE</u> | <u>PERIOD OF USE</u> | <u>DIVERSION RATE</u> | <u>ANNUAL VOLUME</u> |
|-----------------------|----------------------|-----------------------|----------------------|
| Aesthetic Storage     | 01/01 to 12/31       |                       | 7.2 AF               |
| <b><u>Totals:</u></b> |                      |                       | <b>7.2 AF</b>        |

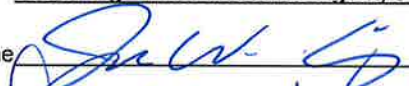
**2. Recommended Amendments**

☐ 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

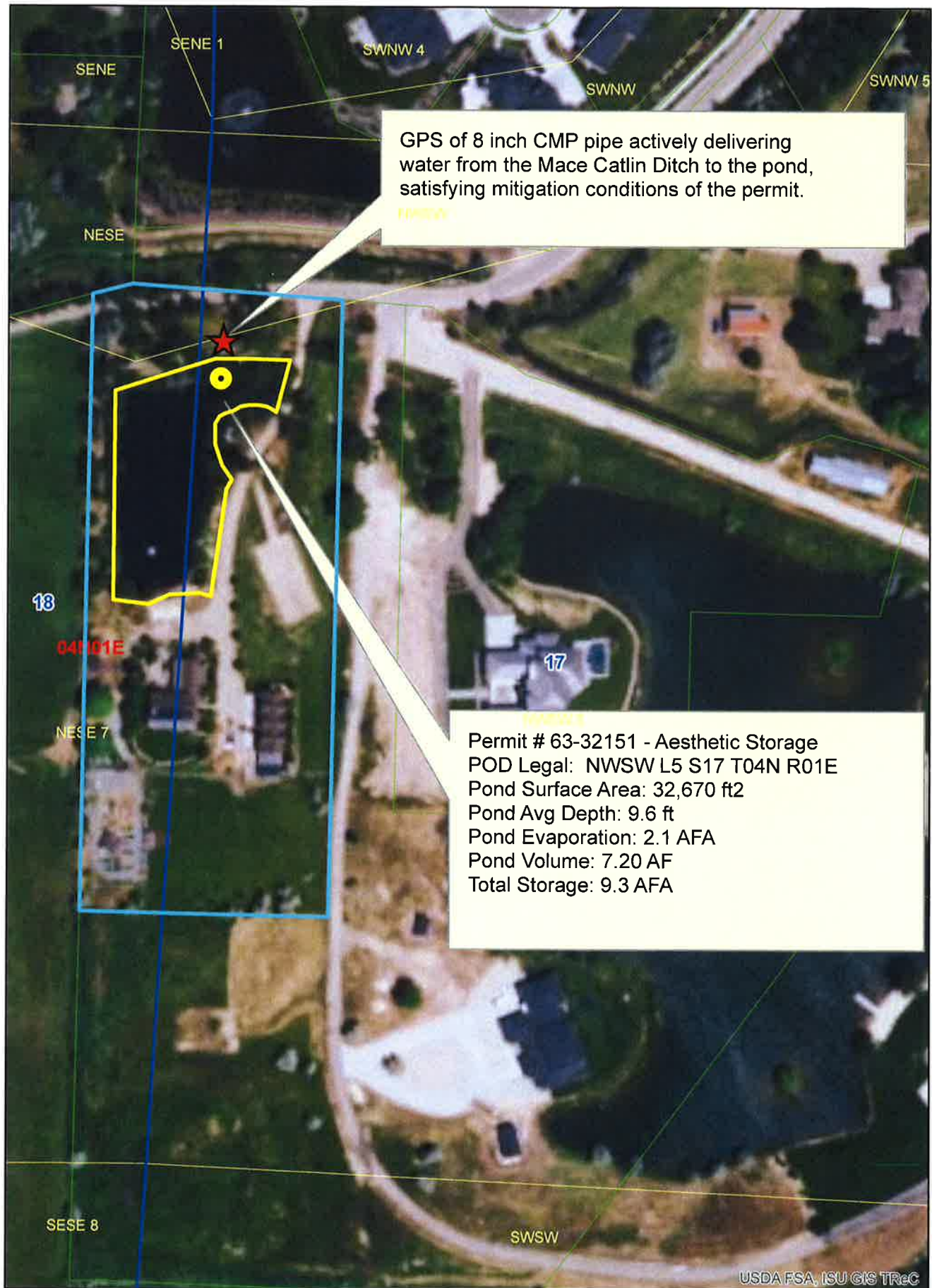
Other: < >

**J. AUTHENTICATION - Jes Erling: Water Resource Agent, Sr.**

Field Examiner's Name  Date 9-9-19

Reviewer  Date 9-10-19

# 63-32151



## 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 | 63-32151   |
| REVIEWER    | Jes Erling |
| DATE        | 9/5/2019   |

|                      |
|----------------------|
| User Input           |
| Calculated value     |
| Formula Explanations |

### INPUTS

|                         |      |     |
|-------------------------|------|-----|
| Pond Surface Area (AC.) | 0.75 | AC. |
|-------------------------|------|-----|

|                             |       |         |
|-----------------------------|-------|---------|
| Pond Surface Area (SQ. FT.) | 32670 | SQ. FT. |
|-----------------------------|-------|---------|

|                                                                           |                      |         |
|---------------------------------------------------------------------------|----------------------|---------|
| I used the following method to obtain my Soil Classification information: | NRCS Web Soil Survey |         |
| My Soil Classification is                                                 | GrndWtr              |         |
| Suggested Seepage Rate (FT./DAY)                                          | 0.0000               | FT./DAY |

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

|                |   |     |
|----------------|---|-----|
| Convert to GPD | 0 | GPD |
|----------------|---|-----|

|                          |     |     |
|--------------------------|-----|-----|
| Total Seepage Loss (AFA) | 0.0 | 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

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

|             |            |
|-------------|------------|
| FILE NUMBER | 63-32151   |
| REVIEWER    | Jes Erling |
| DATE        | 9/5/2019   |

|                      |
|----------------------|
| User Input           |
| Calculated value     |
| Formula Explanations |

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

|                                        |
|----------------------------------------|
| P = Precipitation                      |
| ET= Evapotranspiration                 |
| P <sub>d</sub> = Precipitation deficit |
| P <sub>d</sub> =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 negative precipitation deficit values.

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

### Precipitation Deficit

Station: Boise WSFO Airport (NWS -- USC00101022)

| Month     | mm/day <sup>1</sup> | Days per month | mm/Month |
|-----------|---------------------|----------------|----------|
| Jan       | -0.55               | 31             | 0.00     |
| Feb       | 0.27                | 28             | 7.56     |
| March     | 1.16                | 31             | 35.96    |
| April     | 2.58                | 30             | 77.40    |
| May       | 3.41                | 31             | 105.71   |
| June      | 4.89                | 30             | 146.70   |
| July      | 5.49                | 31             | 170.19   |
| August    | 4.64                | 31             | 143.84   |
| September | 3.17                | 30             | 95.10    |
| October   | 1.76                | 31             | 54.56    |
| November  | -0.06               | 30             | 0.00     |
| December  | -0.71               | 31             | 0.00     |

Total mm/year = 837.02

**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.

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

( 837.02 ÷ 304.8 ) X 0.75 = 2.1 AFA

## Total Storage Calculations

|             |            |
|-------------|------------|
| FILE NUMBER | 63-32151   |
| REVIEWER    | Jes Erling |
| DATE        | 9/5/2019   |

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 |

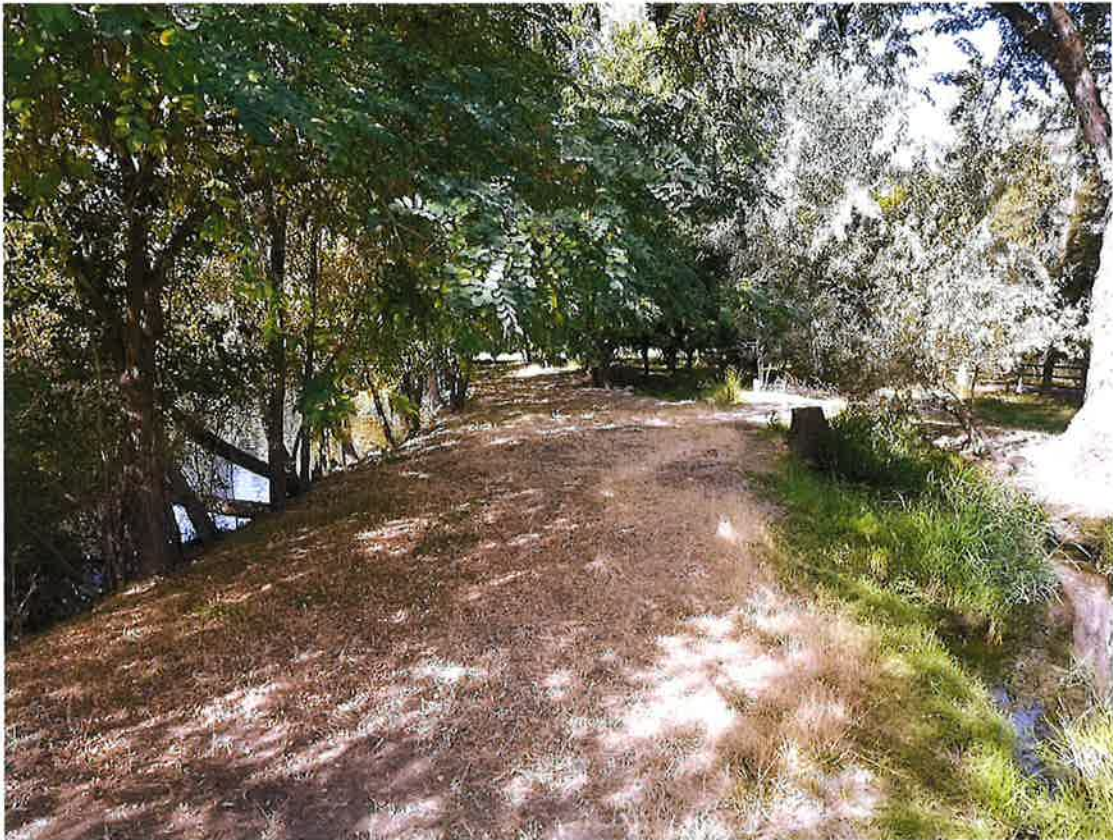
|                                                                                              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Surface Area (AC.)                                                                           | 0.75 | "Surface Area" is automatically carried over from the "Seepage Loss" sheet.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Average Pond Depth (FT.)                                                                     | 9.6  | "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)                                                                           | 7.2  | 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.<br><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) | 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).<br><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)                                                                  | 0.0  | The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Estimated Evaporation Loss (AF)                                                              | 2.1  | The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Total Volume Required (AF)                                                                   | 9.3  | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |



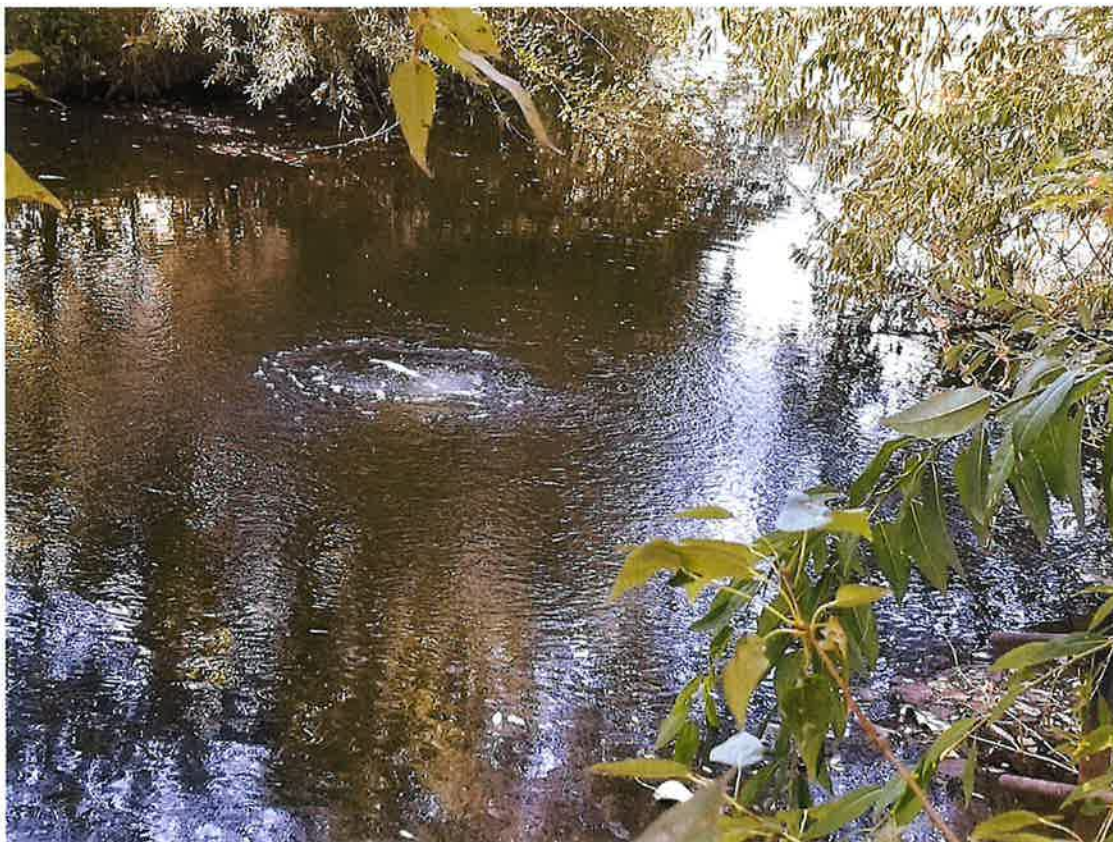
Looking South at Entrance to Pond Site at 1501 Mace Rd. Eagle, ID



Looking West from Front Entrance at Mace-Catlin Ditch



Looking West at Canal Access Road and North End of Pond to the South



Looking South from Canal Access Road at the North End of the Pond (Bubbler)



Looking West along Canal Access Road and at Crossing Culvert. Also Location of Mitigation Pipe.



Looking at Canal Crossing Culvert (Large CMP Pipe) and Mitigation Pipe (Small CMP Pipe)



Looking at Mitigation Pipe Actively Delivering Water to the Pond (North End of Pond)



Looking South from North End of Pond (Overview of Pond)



Looking East from the West Side of Pond (Overview)



Looking at 1:1 Side Slopes of Pond (Same Slope for Entire Pond)