

STATE OF IDAHO  
DEPARTMENT OF WATER RESOURCES  
**BENEFICIAL USE FIELD REPORT**

## A. GENERAL INFORMATION

Permit No: 43-13740

**Exam Date:** 04/25/2019

1. Current Owner:  
STATE OF IDAHO DEPT OF PARKS & RECREATION  
PO BOX 83720 BOISE ID 83720-0065
2. Accompanied by: Trenton Durfee  
Phone No: (208) 824-5911  
Address: 748 E. Castle Rock Rd, Almo, ID 83312  
Relationship to permit Holder: ID State Park Employee (manages irrigation for Castle Rocks State Park)

3. **SOURCE:**  
ALMO CREEK  
GROUND WATER

**Tributary**  
RAFT RIVER

**Method of Determination:** On-site inspection

## B. OVERLAP REVIEW

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

| Water Right No. | Source | Purpose of Use | Basis |
|-----------------|--------|----------------|-------|
|                 |        |                |       |
|                 |        |                |       |

Comments: N/A

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

| Water Right No.                                                               | Source     | Purpose of Use                                                                             | Basis  |
|-------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------|--------|
| 43-2594                                                                       | Almo Creek | Irrigation                                                                                 | Decree |
| Almo Water Company<br>Water Rights - 43-386; 43-<br>2232A; 43-10797; 43-10823 | Almo Creek | Irrigation - Almo Water Co.<br>shares delivered on a 9 day<br>rotation w/other share users | Decree |

Comments: N/A

### C. DIVERSION AND DELIVERY SYSTEM

1. LOCATION OF POINT(S) OF DIVERSION:

GROUND WATER NE¼ NE¼, Sec. 16, Twp 15S, Rge 24E, B.M. CASSIA County

ALMO CREEK SE¼ SE¼ SW¼, Sec. 9, Twp 15S, Rge 24E, B.M. CASSIA County

**Method of Determination:** On-site inspection

**PLACE OF USE:** WILDLIFE

[illegible]

**PLACE OF USE:** WILDLIFE STORAGE

[illegible]

**PLACE OF USE: RECREATION**

| Twp | Rng | Sec | NE |    |    |    | NW |    |    |    | SW |    |    |    | SE |    |    |    | Totals |
|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------|
|     |     |     | NE | NW | SW | SE | NE | NW | SW | SE | NE | NW | SW | SE | NE | NW | SW | SE |        |
| 15S | 24E | 16  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |        |

**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 |        |
| 15S | 24E | 16  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |        |

**PLACE OF USE: AESTHETIC**

| Twp | Rng | Sec | NE |    |    |    | NW |    |    |    | SW |    |    |    | SE |    |    |    | Totals |
|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------|
|     |     |     | NE | NW | SW | SE | NE | NW | SW | SE | NE | NW | SW | SE | NE | NW | SW | SE |        |
| 15S | 24E | 16  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |        |

**PLACE OF USE: AESTHETIC 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 |        |
| 15S | 24E | 16  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |        |

Method of Determination: On-site Inspection

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

  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 |
|---------------------------|------------|----|------------------|-----------|-----------------------------------|
| PODID 515766              |            |    |                  |           |                                   |

**D. FLOW MEASUREMENTS**

1.

| Measurement Equipment | Type | Make | Model No. | Serial No. | Size | Calib. Date |
|-----------------------|------|------|-----------|------------|------|-------------|
| 2' Cipoletti weir     |      |      |           |            |      |             |

2. Measurements: Water shares from the Almo Creek Water Co. are utilized to provide the water for this pond. First, we measured the natural flow in the stream channel at the diversion structure at 0.5' which is equivalent to 2.38 cfs through a 24" Cipoletti weir. Then the natural flow and the delivered water shares were measured at 0.92' or 6.02 cfs through the weir.

6.04 cfs – 2.38 cfs = **3.66 cfs**

**E. FLOW CALCULATIONS N/A**

Additional Computation Sheets Attached

Measured Method:

**F. VOLUME CALCULATIONS**

## 1. Volume Calculations for irrigation: N/A

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

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

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

## 2. Volume Calculations for Other Uses: Aesthetic Storage; Recreation Storage &amp; Wildlife Storage:

The permitted volume of 17.4 acre feet was based on design drawings submitted with the application. When built, the pond was modified to include a 0.3 acre island on the southwestern end of the pond. During the field exam, it was indicated that the addition of the island was the only modification made to the pond design. The lower berm cross section diagram provided as part of the design drawings provided slope & depth information. There is 4:1 slope ratio that extends 20' from the water's edge into the pond and then the slope increases to a 2:1 ratio that extends another 22' to the bottom of the pond that is 16' below the water's surface. That information was used to calculate the area of the pond that could be 16' deep and to calculate the average depth of water impacted by the berm. Since the 4:1 portion of the slope terminates at a 5' depth, the depth at mid-slope would be 2.5'. Since the 2:1 slope adds another 11' of water depth, the average depth at mid-point would be 10.5' (5.5' + 5.0').  $10.5' + 2.5' = 13'/2 = 6.5'$  average depth for an overall area impacted by the 42' sloped berm and/or excavation. Measuring approximately 40' from the ponds edge into the center of the pond (based on the length of the berm and/or excavation), I estimated that there is approximately an 0.24 acre portion of the pond with a 16' depth on the northeastern side of the pond (see attached Volume Diagram).

Therefore:

$$0.24 \text{ acre surface area} \times 16' = 3.84 \text{ af}$$

$$1.27 \text{ acres total pond surface area} - 0.24 \text{ acres} = 1.03 \text{ acres}$$

$$1.03 \text{ acres surface area} \times 6.5' = 6.69 \text{ af}$$

$$6.69 \text{ af} + 3.84 \text{ af} = \mathbf{10.5 \text{ af}}$$

Evaporative Loss:

According to the University of Idaho website *ETIdaho* 2017, the annual precipitation deficit for open water – shallow systems (ponds/streams) at the Malta 1NE Weather Station is 796 mm:

$$1.27 \text{ acres} \times (796\text{mm}/304.8) = \mathbf{3.3 \text{ af}}$$

$$10.5 \text{ af storage} + 3.3 \text{ afa evaporative storage} = \mathbf{13.8 \text{ af}}$$

**G. NARRATIVE/REMARKS/COMMENTS**

On 4/25/2019 I stopped in at Castle Rocks State Park to look at the permitted pond while I was in the area conducting other field exams. Only 10 minutes after my arrival at the pond, two Idaho state park vehicles pulled into the parking area and three state park employees approached me at the pond. One of the employees, Trenton Durfee, indicated that he was responsible for irrigation and water delivery for the park. We talked about the pond and he indicated that as far as he knew it was constructed to the design specifications with the exception of the addition of an island in the southwest area of the pond. None of the staff present were able to provide any definitive information as to maximum depth or storage capacity and indicated that the only information they knew of were the design drawings I already had copies of. I then inquired about the diversion and how they measure water there. Mr. Durfee agreed to take me up to the diversion and demonstrate how the water is measured.

At the diversion there are concrete check structures across the stream channel and at the head of the ditch. There are metal slots in the structures for check boards and they are also used to insert a 2' metal Cipoletti weir to measure the flow through

the structures (see Figures 6 & 7). Mr. Durfee demonstrated how he measures the water over the weir (0.5' of stream flow) and then converts that to cfs using the discharge tables from the Bureau of Reclamation's Water Measurement Manual (0.5' over a 2' Cipolletti weir is equivalent to 2.38 cfs). The total flow, which included natural flows and delivered Almo Water Co. shares was measured at 0.92' over the weir in the main channel, which is equivalent to total flow (stream flow and delivered shares) of 6.04 cfs. That indicates that approximately 3.66 cfs was available to deliver down the ditch to the pond.

Refer to Section F2 on page three for the methodology used to estimate the volume of water the pond can store. There is a water control structure at the southwest end of the pond that is designed to maintain a fairly constant water volume in the pond (see attached Water Control Structure and Lower Berm Cross-Section diagram and Figures 3,4 & 5) and allow for flow through to refresh the water for the trout in the pond. This flow through component is the purpose for the 3.00 cfs permitted as Wildlife; Recreation & Aesthetic uses on the permit. Overflow from the water control structure is diverted out a pipe on the south end of the pond and flows out towards the east into a wetland area south of the pond where it tends to disperse or sink into the wetland. The ground water portion of this permit is the naturally occurring ground water intercepted by the excavation of the pond and is part of the total volume of the pond.

On the day I visited the pond there were Canadian Geese on the island, deer tracks were present nearby and the stocked trout were rising in the pond (Figure 8).

Recommend licensing a diversion rate of 3.00 cfs and a storage volume of 13.8 af.

Have conditions of permit approval been met?  X  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> |
|-----------------------|----------------------|--------------------------|----------------------|
| WILDLIFE              | 04/01 to 10/31       | 3.00 CFS                 |                      |
| WILDLIFE STORAGE      | 01/01 to 12/31       |                          | 13.8 AF              |
| RECREATION            | 04/01 to 10/31       | 3.00 CFS                 |                      |
| RECREATION STORAGE    | 01/01 to 12/31       |                          | 13.8 AF              |
| AESTHETIC             | 04/01 to 10/31       | 3.00 CFS                 |                      |
| AESTHETIC STORAGE     | 01/01 to 12/31       |                          | 13.8 AF              |

**Totals:** 3.00 CFS 13.8 AF

### 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

## I. AUTHENTICATION William Mills - Water Resource Agent, Senior

Field Examiner's Name William A. Mills Date 5/20/2019

Reviewer   Date



Figure 1: Looking southeast from ditch inlet across the pond



Figure 2: Looking south from ditch inlet towards island



Figure 3: Water control structure at south end of pond



Figure 4: Inside the water control structure



Figure 5: Flow from the outlet of the water control structure below the south end of the pond



Figure 6: Diversion structure on Almo Creek

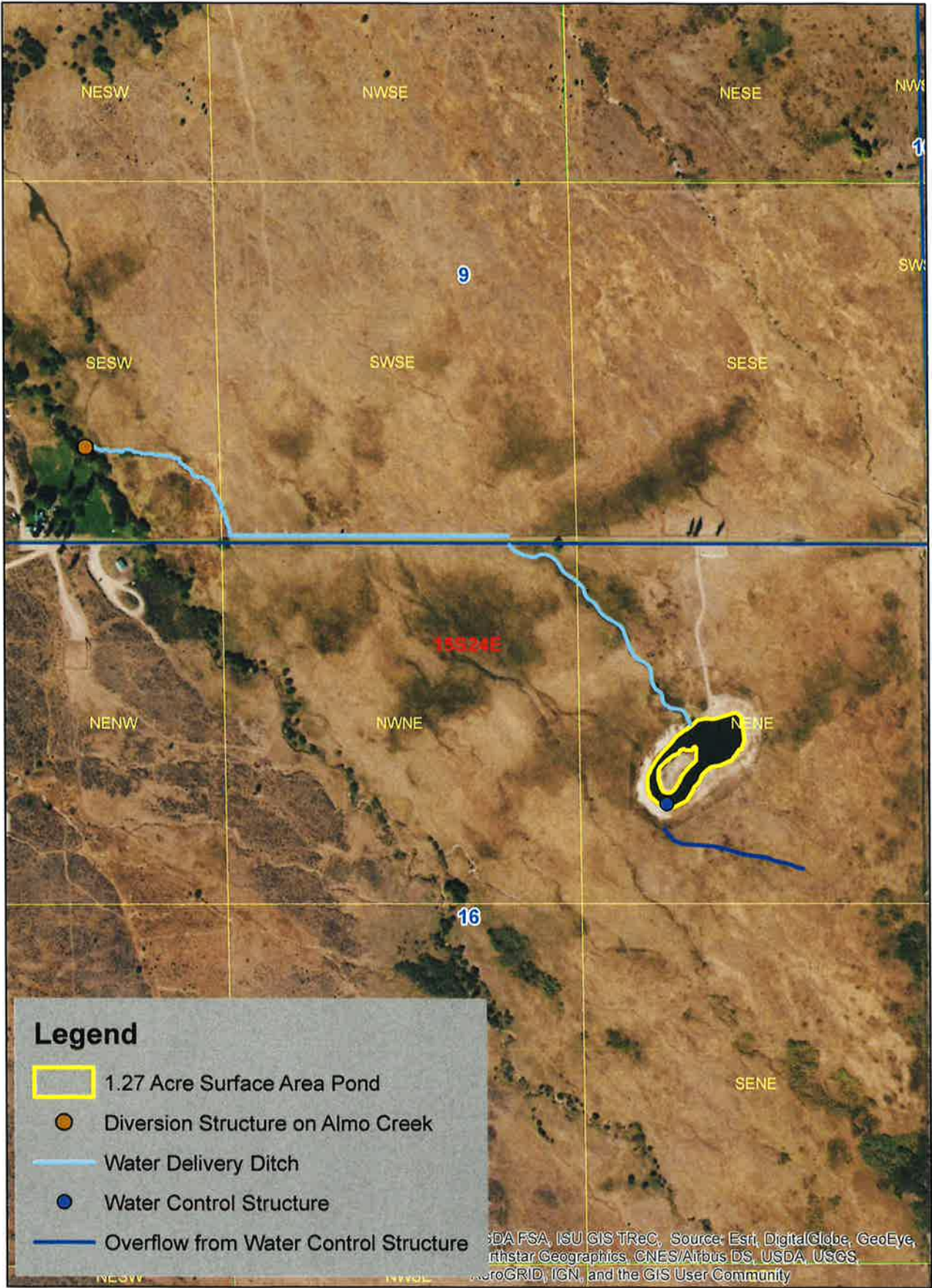


Figure 7: Measuring total flow, delivered water shares and streamflow

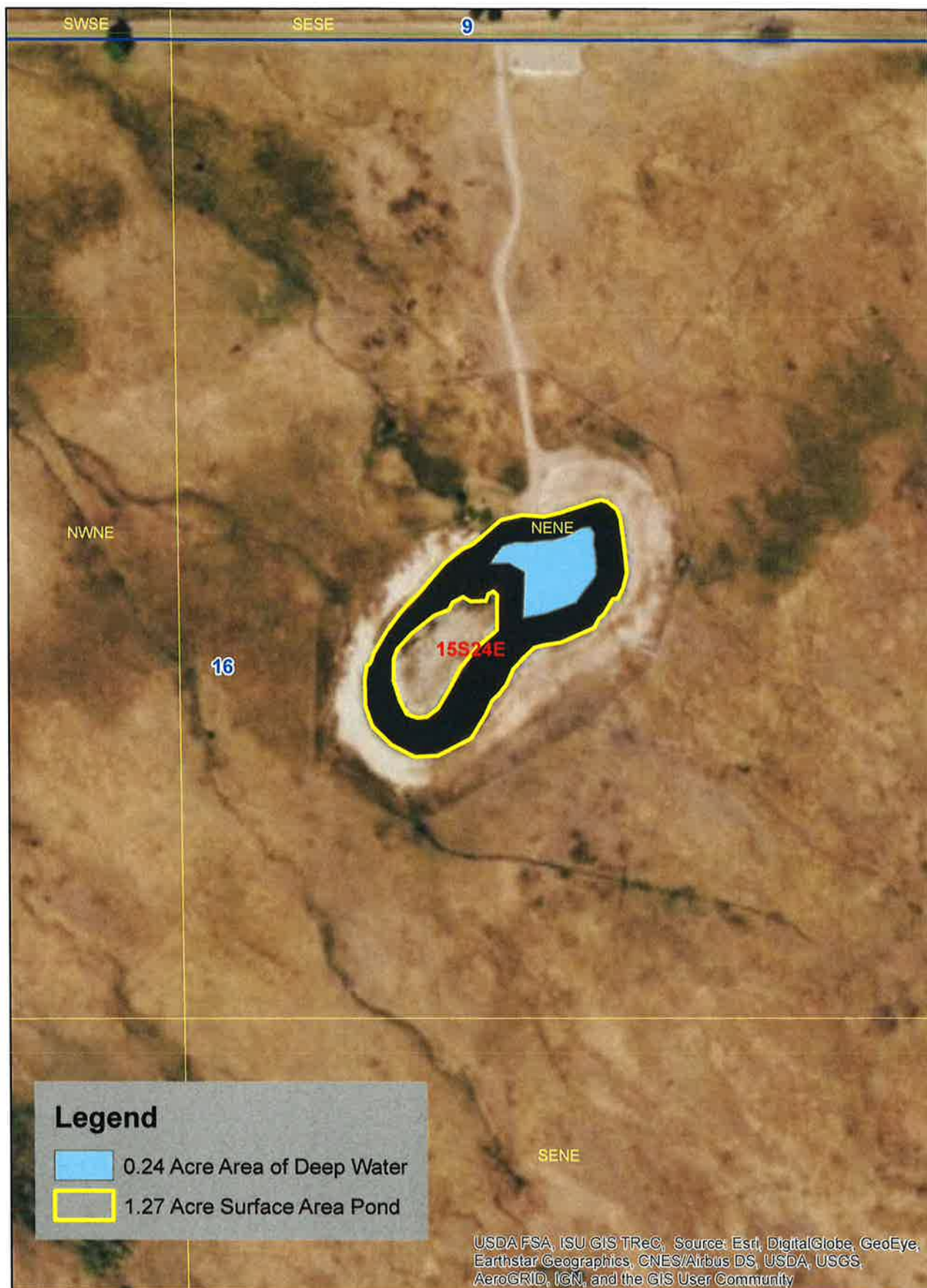


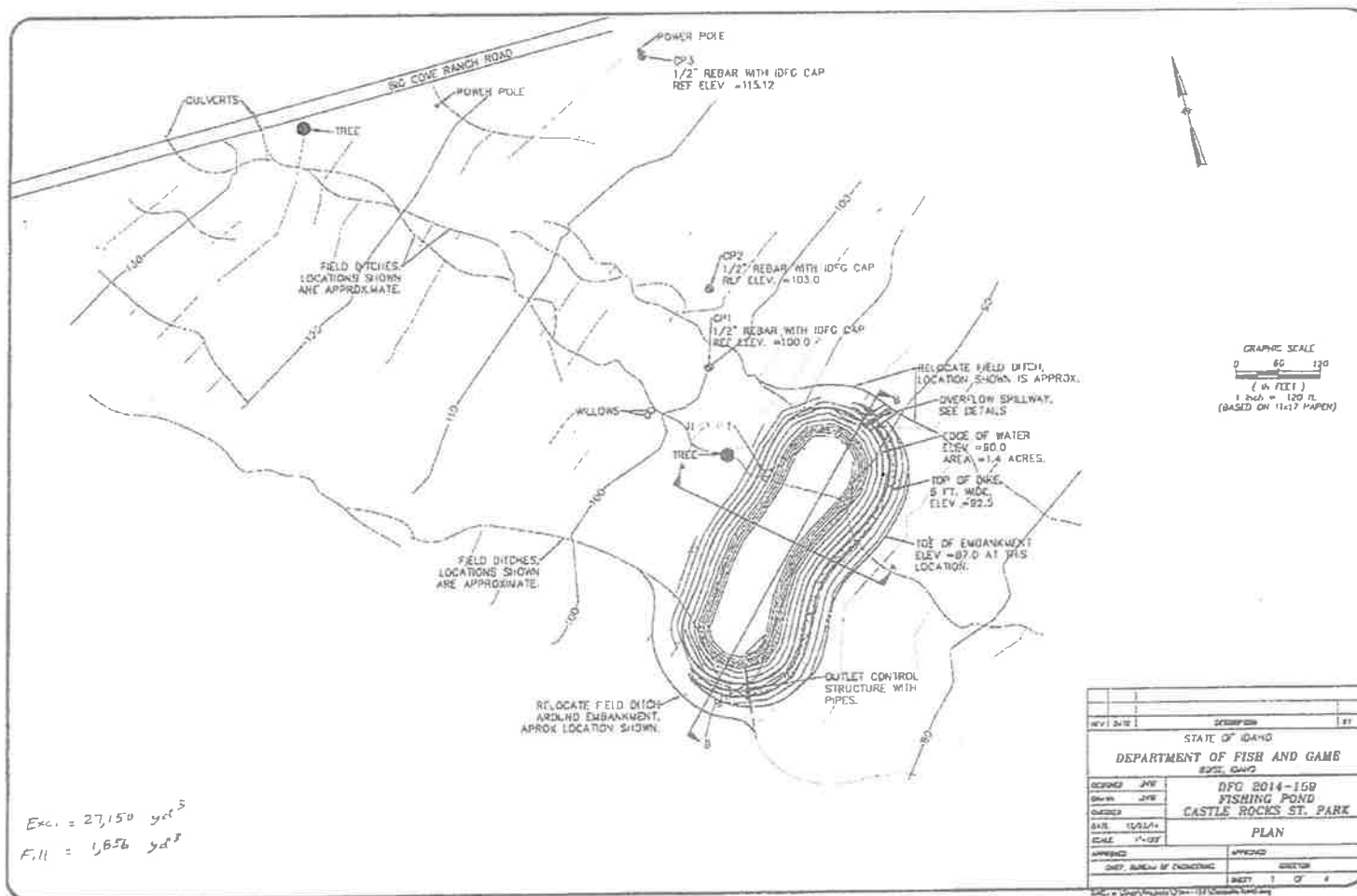
Figure 8: Looking northeast towards Castle Rocks with fish rising

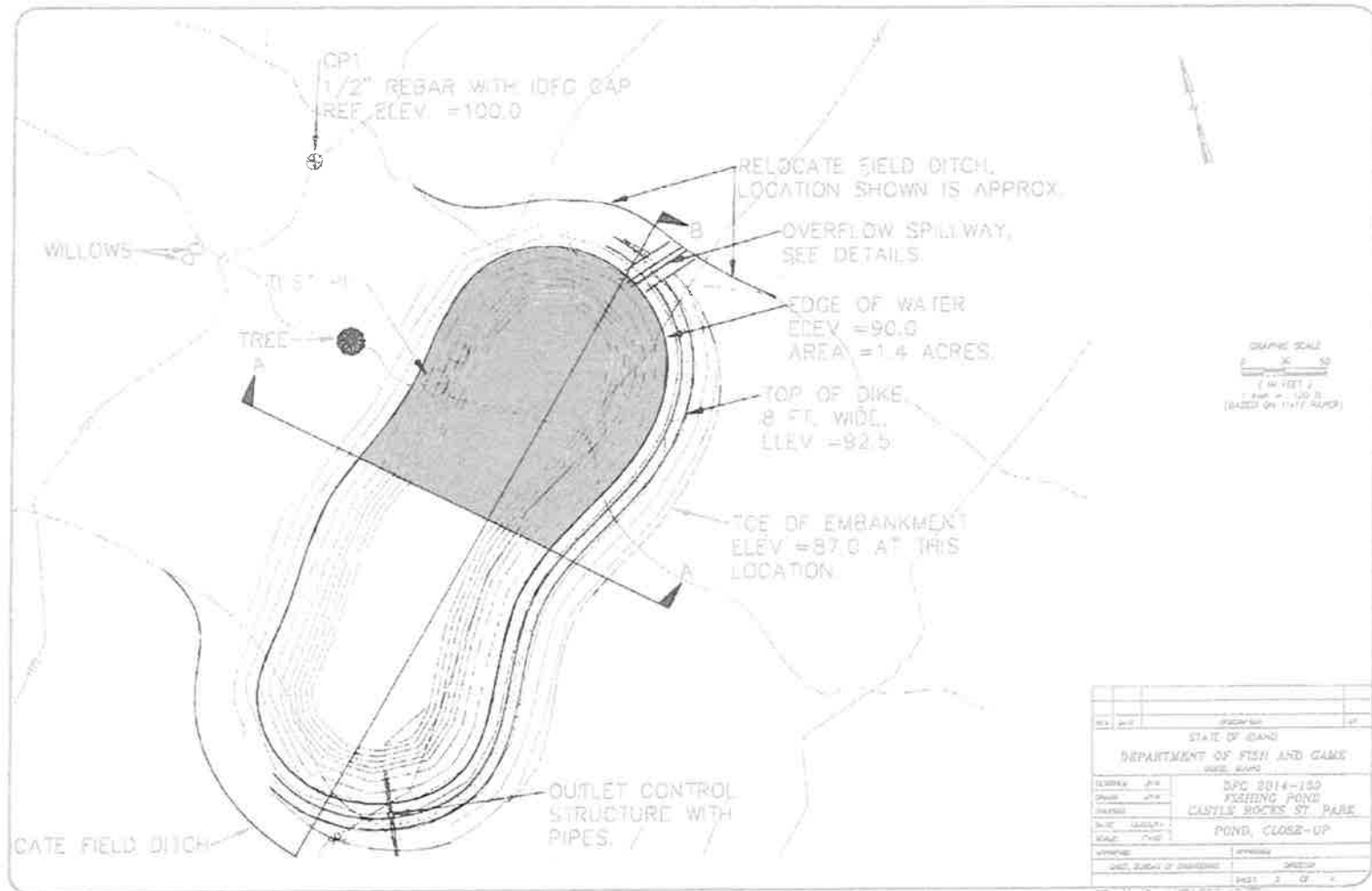
# System Diagram

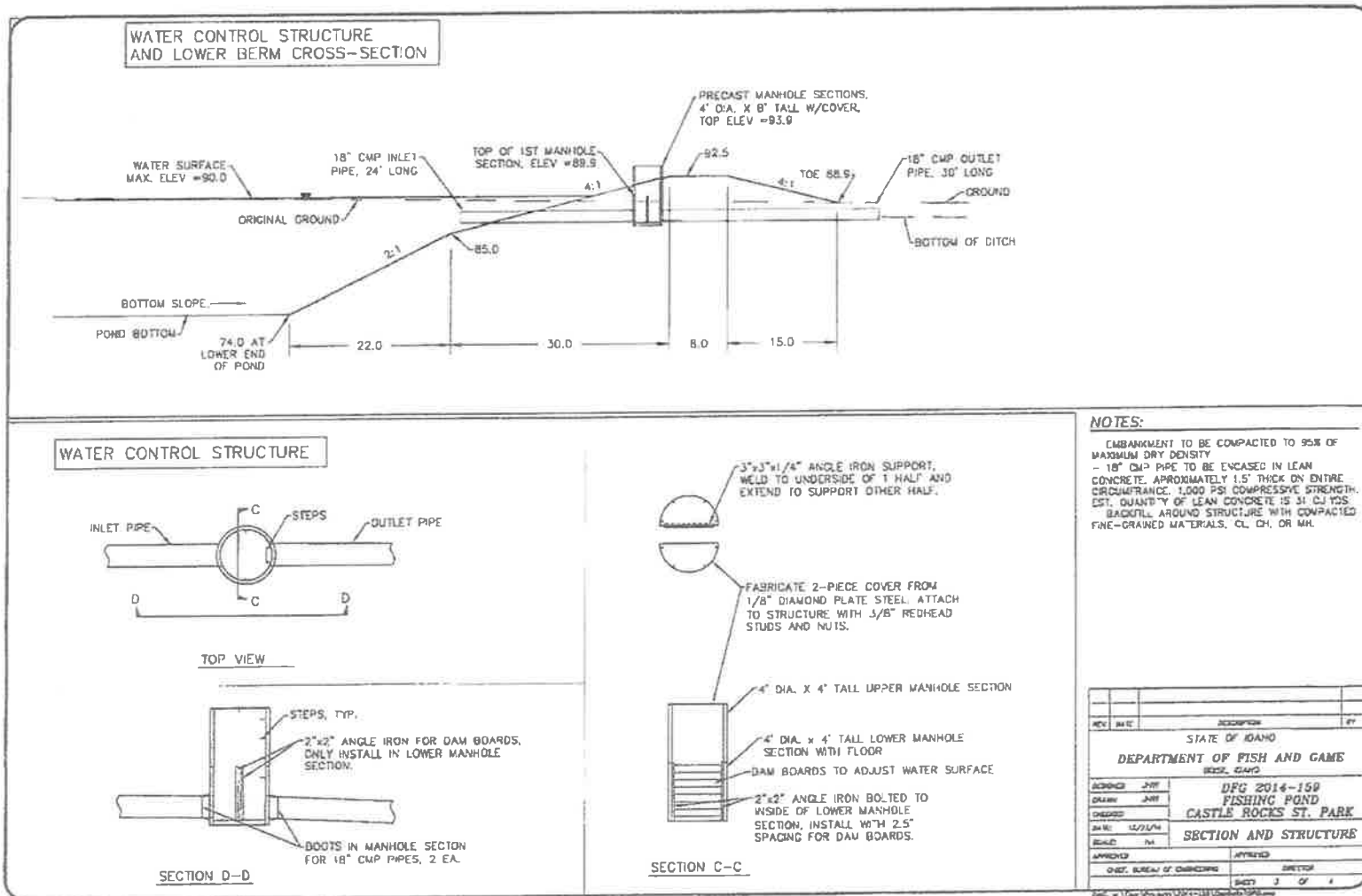


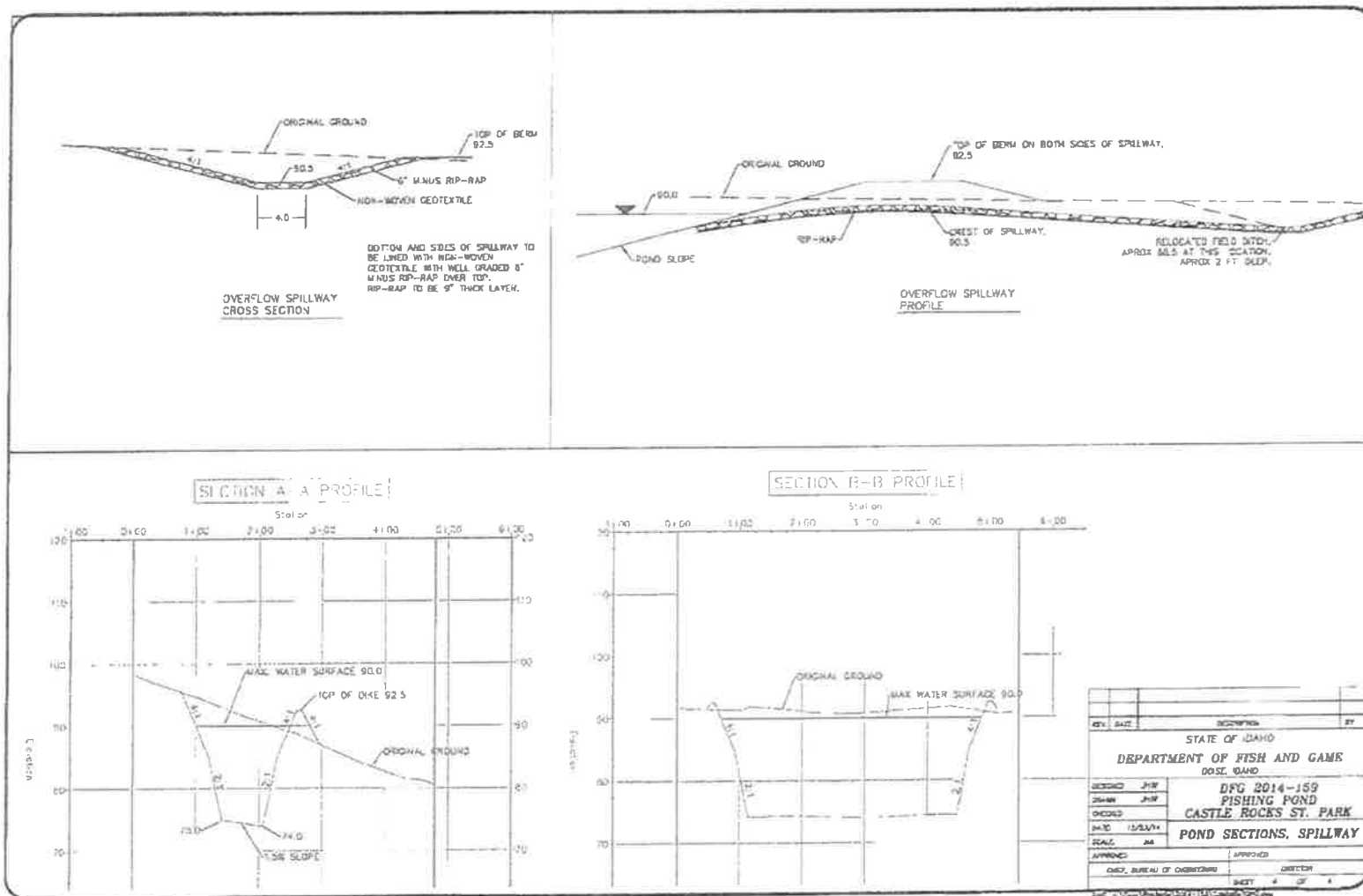
# Volume Diagram











INCORPORATED UNDER THE LAWS OF  
IDAHO

220 CAPITAL STOCK \$57,500.00 Shares 9.5

**THE ALMO WATER CO.**  
FOR  
Reclamation of Arid Lands

THIS CERTIFIES THAT *State of Idaho Parks and Recreation Board* is the owner of  
9.5 Shares of each of the Capital Stock of  
**THE ALMO WATER CO. (ASSESSABLE)**  
*transferable only on the books of the Corporation by the holder  
hereof in person or by Attorney upon surrender of this Certificate  
properly endorsed.*  
In Witness Whereof, the said Corporation has caused this Certificate to be  
signed by its duly authorized officers and to be sealed with the Seal of the Corporation  
this 22 day of Oct. AD 19  
2004  
*Edward Sheldon* SECRETARY *[Signature]* PRESIDENT

SHARES EACH

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