

[illegible]

Method of Determination: on-site inspection, aerial imagery in ArcMap (2009, 2011, & 2013 NAIP), satellite imagery in ArcMap (LANDSAT 2013) & Google Earth (2009-2013)

3. ATTACHMENTS

- 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
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
Submerged Orifice	Rectangular				6" X 30"	
Weir	Contracted Rectangular				3'	
Weir	Contracted Rectangular				3'	

2. Measurements:

On the day of the field exam, water was not flowing into the ponds. The high water marks on the staff gages at the submerged orifice at the point of diversion were noted at 2.2' on the upstream gage and 2.5' on the downstream gage. However, when using the upstream and downstream staff gages on a submerged orifice to measure flow, the readings need to be taken simultaneously in order to determine the difference in head and calculate the flow. Therefore, the high water marks were noted but were not utilized in the flow or volume calculations.

The Ranch Manager indicated the ponds were utilized from 9/1 – 4/30 and provided some diversion data from the winter of 2017/2018 observed at the staff gages at the point of diversion (see attached); however, the data provided do not show both the upstream and downstream staff gage readings. Without both readings, it is not possible to calculate the head difference which is required to measure the flow through the submerged orifice.

To determine the most accurate measurement available for the rate of flow through the ponds, the high water marks on the contracted rectangular weirs at the outlet of each pond were measured. The outlets at both the upper and lower ponds indicated a maximum height of 0.9' through the 3' weirs.

E. FLOW CALCULATIONS

Additional Computation Sheets Attached

Measured Method: High water mark on contracted rectangular weirs

Referencing Table A7-2 in the US Bureau of Reclamation Water Measurement Manual, a measured head of 0.9' through a 3' standard contracted rectangular weir equates to a flow of 8.02 cfs. This is based on the Francis (1883) equation: $Q = 3.33(L - 0.2h)h^{1.5}$ where L is the length of the weir in feet and h is the head on the weir in feet.

$$Q = 3.33[3 - 0.2(0.90)] * 0.90^{1.5} = 8.02 \text{ cfs}$$

Per IDAPA 37.03.02, Rule 35.01.o the amount of water shall be limited to the smaller of the following amounts:

- Permitted amount: 4.40 cfs
- Amt. upon which the license exam fee is paid: up to 4.40 cfs
- Capacity of diversion works: unknown
- Amt. beneficially used: 8.02 cfs

In this case, the permitted amount is the limiting factor at 4.40 cfs.

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: Wildlife & Water Quality Improvement

Per Ranch Manager, assume diversion season 9/1 – 4/30 (242 days).

Absent more detailed information, assume constant diversion rate of 4.40 cfs.

This results in an annual diversion volume of 2112.0 acre feet.

$$4.40 \text{ cfs} \times \frac{1.9835 \frac{\text{ac} - \text{ft}}{\text{day}}}{1 \text{ cfs}} \times 242 \text{ days} = 2112.0 \text{ ac} - \text{ft}$$

G. NARRATIVE/REMARKS/COMMENTS

Application for Permit 45-14135 was filed on April 13, 2007 by Travis Thompson, the attorney representing Six S Ranch LLC, for the diversion of 4.4 cfs from Marsh Creek for wildlife and water quality improvement uses. The permit was issued on September 9, 2008 with proof due by October 1, 2013. Proof of Beneficial Use was filed on September 27, 2013. On August 27, 2018, Corey Skinner, Bill Mills, and I met ranch manager Nick Takas to perform the field exam. Note that Bill Mills and Corey Skinner had also previously visited the property in March 2017.

The point of diversion and place of use are located approximately 3 miles east and 5 miles north of Albion. At the point of diversion is a rectangular submerged orifice measuring 6" X 30" at the head of a buried pipeline diverting out of Marsh Creek. The Ranch Manager explained that the diversion can be closed and locked when water is not being diverted. Staff gages are mounted on the upstream and downstream sides of the submerged orifice. On the day of the field exam, the diversion was closed.

From the point of diversion, water flows through a stretch of buried pipe approximately 850 feet where it then enters an open channel. The channel runs approximately 90 feet until it flows into the upper pond. Note that this permit is for non-consumptive flow-through purposes only; other water rights authorize storage water for the pond (see Item B – Overlap Review above).

On the day of the field exam, there was no water in the pond. This is consistent with the stated purpose of the pond. The Ranch Manager explained that water is diverted to the pond during the non-irrigation season, approximately September 1 – April 30. Using limited aerial and satellite imagery available to the Department from the late fall and early spring (note, most available imagery is during the irrigation season when the pond is dry and the pixel size of the satellite imagery makes it difficult to discern fine details), I observed the place of use of the permit. The imagery indicates that the ponds are dry in the summer. The only exception I observed from aerial photography was in 2017, which was a relatively wet year, where the ponds appear full during the summer. Note the overlapping rights do allow for year round storage and diversion to storage during the irrigation season.

At the lower end of the pond, water flows over a 3 foot wide contracted rectangular weir into an open channel which runs approximately 430 feet where it reaches a junction. Water can continue flowing through the open channel for another approximately 50 feet to the lower pond inlet, or it can be diverted to what appears to be an overflow area. At the lower end of the second pond is another 3 foot wide contracted rectangular weir into an open channel which runs approximately 150 feet before emptying into Marsh Creek.

During the field exam, photos were collected of the point of diversion and place of use (see attachments).

I recommend licensing both wildlife and water quality improvement uses at the permitted rate of 4.4 cfs with a 4.4 cfs total diversion rate for the period of 9/1 – 4/30 with an annual volume of 2112 ac-ft for each use with a total annual volume of 2112 ac-ft.

In reviewing the conditions on the permit, condition 029 requires the permit holder to comply with fish screening and/or passage requirements of the Idaho Department of Fish and Game (IDFG). The Department backfile shows that a letter was sent to the IDFG requesting comments and/or recommendations during the advertising of the application in June 2008. However, Department records indicate that no comments or recommendations were received from IDFG for this permit. In Basin 45, Condition 029 is typically only placed on permits at the request of IDFG. Additionally, condition 029 is not on any of the existing water rights for this system. It appears that it was placed on the permit inadvertently, and will be dropped at licensing. All other conditions on the permit will be carried forward, except for 01H which requires a lockable device, and it will be replaced by R02 as is recommended at licensing.

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>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
WILDLIFE	09/01 – 04/30	4.4 CFS	2112.0
WATER QUALITY IMPROVEMENT	09/01 – 04/30	4.4 CFS	2112.0
Totals:		4.4 CFS	2112.0 AF

2. Recommended Amendments

<u> </u> Change P.D. as reflected above	<u> </u> Add P.D. as reflected above	<u> X </u> None
<u> </u> Change P.U. as reflected above	<u> </u> Add P.U. as reflected above	<u> X </u> None

I. AUTHENTICATION

Field Examiner's Name Allison Inouye Date 4/24/2019
Allison Inouye - Water Resource Agent, Senior

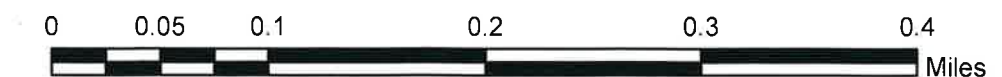
Reviewer _____ Date _____

Attachment to 45-14135 Beneficial Use Field Report: System Diagram & Map



Legend

- Township/Range
- Sections
- QQ



45-14135 Attachment to Beneficial Use Field Report: Photographs

Point of Diversion & Measuring Device



45-14135 – Photographs, cont.

☼ 180°S (T) ● 42.488792°N, 113.514633°W ±16.4ft ▲ 4412ft



Above: Upper pond POU taken from outlet structure

Below: Upper pond outlet structure

☼ 302°NW (T) ● 42.488682°N, 113.514572°W ±16.4ft ▲ 4409ft



45-14135 – Photographs, cont.

☉ 315°NW (T) ☉ 42.488747°N, 113.514671°W ±16.4ft ▲ 4410ft



Above: Open channel between upper pond and lower pond

Below: Diversion to overflow area between upper pond and lower pond

☉ 46°NE (T) ☉ 42.489727°N, 113.515320°W ±16.4ft ▲ 4401ft



45-14135 – Photographs, cont.

☉ 134°SE (T) ☉ 42.490734°N, 113.516174°W ±16.4ft ▲ 4401ft



Above: Lower pond POU and outlet structure

Below: Open channel below lower pond to Marsh Creek

☉ 303°NW (T) ☉ 42.490738°N, 113.516197°W ±16.4ft ▲ 4400ft



3/5/2018

Six S Ranch Wetlands Readings

Permit 45-14137

8/1/17 1.75

8/18/18 1.8

10/27/17 1.4

11/20/17 1.5

12/8/17 1.8

1/8/18 2.1

3/5/18 2.2

Permit 45-14136

8/1/17 0

8/18/18 0

10/27/17 0

11/20/17 .5

12/8/17 .6

1/8/18 .6

3/5/18 .6

Permit 45-14135

8/1/17 1.8

8/18/17 1.7

10/27/17 1.3

11/20/17 1.85

12/8/17 1.8

1/8/18 1.7

3/5/18 1.6

Permit 45-14134

8/1/17 1.35

8/18/17 1.35

10/27/17 1.7

11/20/17 2.21

12/8/17 2.1

1/8/18 2.3

3/5/18 1.8