

State of Idaho  
Department of Water Resources  
**Water Right License**  
WATER RIGHT NO. 63-31683

**PRIORITY:** October 28, 1993

Maximum Diversion Rate: 0.20 CFS  
Maximum Diversion Volume: 45.0 AF

It is hereby certified that:

VICKI CANTLON 8401 S COLE RD BOISE ID 83709 And/Or  
ROGER CANTLON 8401 S COLE RD BOISE ID 83709

has complied with the terms and conditions of the permit, issued pursuant to Application for Permit dated October 28, 1993, and has submitted Proof of Beneficial Use on May 30, 2013. An examination confirms water is diverted from:

**SOURCE:**  
GROUND WATER

and a water right has been established as follows:

| <u>BENEFICIAL USE</u> | <u>PERIOD OF USE</u> | <u>DIVERSION RATE</u> | <u>ANNUAL DIVERSION VOLUME</u> |
|-----------------------|----------------------|-----------------------|--------------------------------|
| IRRIGATION            | 03/01 to 11/15       | 0.20 CFS              | 45.0 AF                        |

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

GROUND WATER SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  Sec. 12, Twp 02N, Rge 01E, B.M. ADA County

**PLACE OF USE:** IRRIGATION

| Twp | Rge | Sec | NE |    |    |      | NW |    |    |    | SW |    |    |    | SE |    |    |    | Totals |
|-----|-----|-----|----|----|----|------|----|----|----|----|----|----|----|----|----|----|----|----|--------|
|     |     |     | NE | NW | SW | SE   | NE | NW | SW | SE | NE | NW | SW | SE | NE | NW | SW | SE |        |
| 02N | 01E | 12  |    |    |    | 10.0 |    |    |    |    |    |    |    |    |    |    |    |    | 10.0   |

Total Acres: 10

**CONDITIONS OF APPROVAL**

1. When the irrigation component of the domestic use under right 63-10526 is combined with right 63-31683 they shall not exceed the irrigation of 10 acres.
2. This right when combined with all other rights shall provide no more than 0.02 cfs per acre nor more than 4.5 afa per acre at the field headgate for irrigation of the lands above.
3. After specific notification by the Department, the right holder shall install a suitable measuring device or shall enter into an agreement with the Department to use power records to determine the amount of water diverted and shall annually report the information to the Department.

This license is issued pursuant to the provisions of Section 42-219, Idaho Code. The water right confirmed by this license is subject to all prior water rights and shall be used in accordance with Idaho law and applicable rules of the Department of Water Resources.

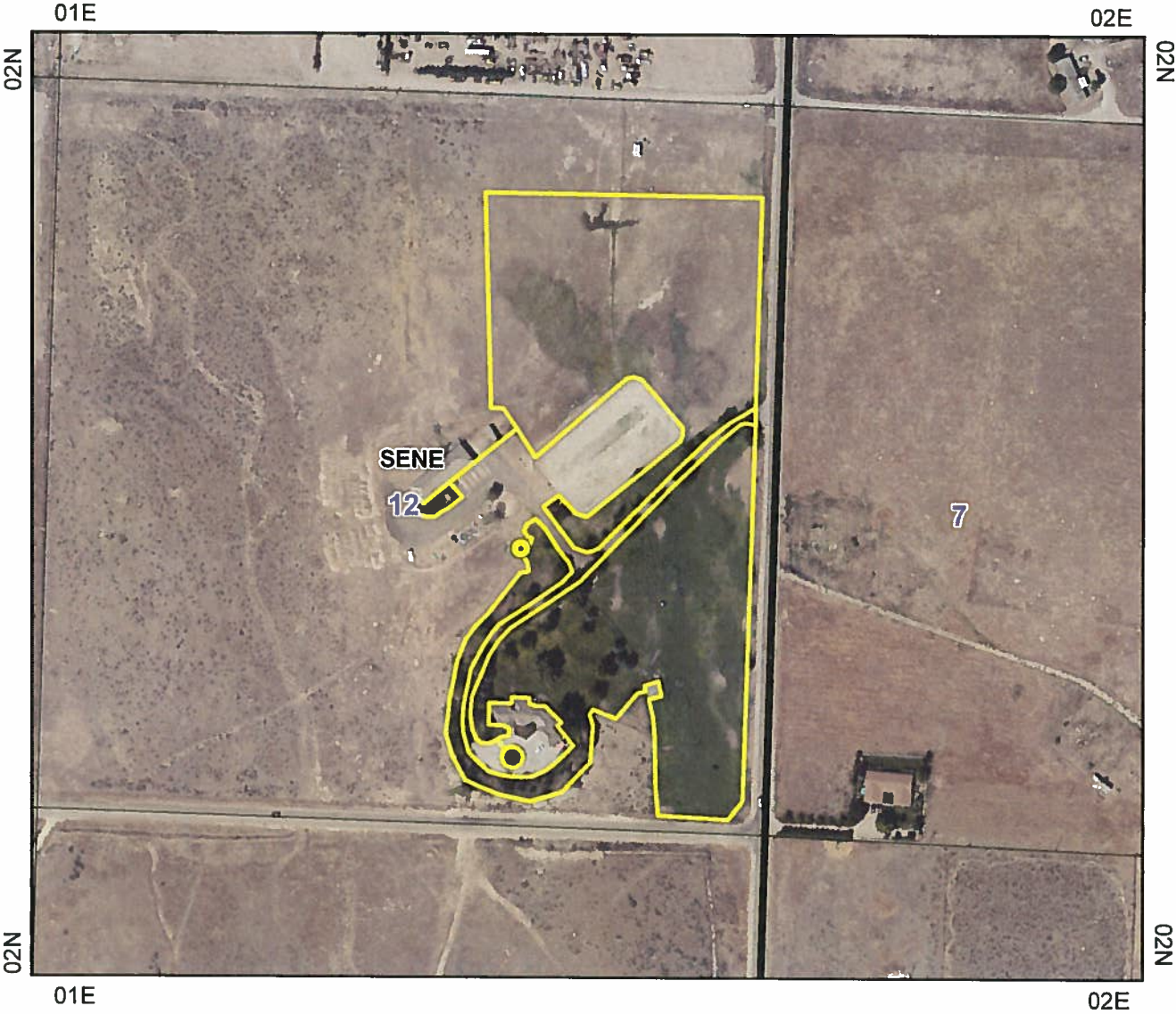
Signed this 24<sup>th</sup> day of October, 2017.



SHELLEY W. KEEN  
Water Rights Section Manager

State of Idaho  
Department of Water Resources  
**Attachment to Water Right License**  
63-31683

This map depicts the IRRIGATION place of use boundary for this water right at the time of this approval and is attached to the approval document solely for illustrative purposes.



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

0 0.0375 0.075 0.15 Miles





State of Idaho

## DEPARTMENT OF WATER RESOURCES

322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098

Phone: (208) 287-4800 • Fax: (208) 287-6700 • Web Site: [www.idwr.idaho.gov](http://www.idwr.idaho.gov)

GARY SPACKMAN  
Director

C.L. "BUTCH" OTTER  
Governor

October 25, 2017

VICKI CANTLON  
ROGER CANTLON  
8401 S COLE RD  
BOISE ID 83709

RE: License No. 63-31683

### Issuance of License

Dear Water Right Holder(s):

The Department of Water Resources has issued the enclosed Water Right License confirming that a water right has been established in accordance with your permit. Please be sure to thoroughly review the conditions of approval and remarks listed on your license.

The license is a PRELIMINARY ORDER issued by the Department pursuant to section 67-5243, Idaho Code. It can and will become a final order without further action by the Department unless a party petitions for reconsideration or files an exception and/or brief within fourteen (14) days of the service date as described in the enclosed information sheet.

Please note that water right owners are required to report any change of water right ownership and/or mailing address to the Department within 120 days of the change. Failure to report these changes could result in a \$100 late filing fee. Contact any office of the Department or visit the Department's homepage on the Internet to obtain the proper forms and instructions.

If you have any questions, please contact me at 208-287-4951.

Sincerely,

A handwritten signature in blue ink that reads "Pamela Skaggs".

Pamela Skaggs, Water Rights Supervisor  
Water Right Permits Section

Enclosure(s)

cc: SPF WATER ENGINEERING LLC

## **CERTIFICATE OF SERVICE**

I hereby certify that on October 26, 2017 I mailed a true and correct copy, postage prepaid, of the foregoing PRELIMINARY ORDER(Approved License) to the person(s) listed below:

**RE: WATER RIGHT NO.**

**63-31683**

**ROGER CANTLON  
8401 S COLE RD  
BOISE ID 83709**

**VICKI CANTLON  
8401 S COLE RD  
BOISE ID 83709**

**SPF WATER ENGINEERING LLC  
C/O LORI GRAVES  
300 E MALLARD DR STE 350  
BOISE ID 83706**



**Darla Block  
Technical Records Specialist**

## **EXPLANATORY INFORMATION TO ACCOMPANY A PRELIMINARY ORDER**

(To be used in connection with actions when a hearing was not held)

(Required by Rule of Procedure 730.02)

The accompanying order or approved document is a "Preliminary Order" issued by the department pursuant to section 67-5243, Idaho Code. It can and will become a final order without further action of the Department of Water Resources ("department") unless a party petitions for reconsideration, files an exception and brief, or requests a hearing as further described below:

### **PETITION FOR RECONSIDERATION**

Any party may file a petition for reconsideration of a preliminary order with the department within fourteen (14) days of the service date of this order. **Note: the petition must be received by the department within this fourteen (14) day period.** The department will act on a petition for reconsideration within twenty-one (21) days of its receipt, or the petition will be considered denied by operation of law. See Section 67-5243(3) Idaho Code.

### **EXCEPTIONS AND BRIEFS**

Within fourteen (14) days after: (a) the service date of a preliminary order, (b) the service date of a denial of a petition for reconsideration from this preliminary order, or (c) the failure within twenty-one (21) days to grant or deny a petition for reconsideration from this preliminary order, any party may in writing support or take exceptions to any part of a preliminary order and may file briefs in support of the party's position on any issue in the proceeding with the Director. Otherwise, this preliminary order will become a final order of the agency.

### **REQUEST FOR HEARING**

Unless a right to a hearing before the Department or the Water Resource Board is otherwise provided by statute, any person aggrieved by any final decision, determination, order or action of the Director of the Department and who has not previously been afforded an opportunity for a hearing on the matter may request a hearing pursuant to section 42-1701A(3), Idaho Code. A written petition contesting the action of the Director and requesting a hearing shall be filed within fifteen (15) days after receipt of the denial or conditional approval.

### **ORAL ARGUMENT**

If the Director grants a petition to review the preliminary order, the Director shall allow all parties an opportunity to file briefs in support of or taking exceptions to the preliminary order and may schedule oral argument in the matter before issuing a final order. If oral arguments are to be heard, the Director will within a reasonable time period notify each party of the place, date and hour for the argument of the case. Unless the Director orders otherwise, all oral arguments will be heard in Boise, Idaho.

## CERTIFICATE OF SERVICE

All exceptions, briefs, requests for oral argument and any other matters filed with the Director in connection with the preliminary order shall be served on all other parties to the proceedings in accordance with IDAPA Rules 37.01.01302 and 37.01.01303 (Rules of Procedure 302 and 303).

## FINAL ORDER

The Director will issue a final order within fifty-six (56) days of receipt of the written briefs, oral argument or response to briefs, whichever is later, unless waived by the parties or for good cause shown. The Director may remand the matter for further evidentiary hearings if further factual development of the record is necessary before issuing a final order. The department will serve a copy of the final order on all parties of record.

Section 67-5246(5), Idaho Code, provides as follows:

Unless a different date is stated in a final order, the order is effective fourteen (14) days after its service date if a party has not filed a petition for reconsideration. If a party has filed a petition for reconsideration with the agency head, the final order becomes effective when:

- (a) The petition for reconsideration is disposed of; or
- (b) The petition is deemed denied because the agency head did not dispose of the petition within twenty-one (21) days.

## APPEAL OF FINAL ORDER TO DISTRICT COURT

Pursuant to sections 67-5270 and 67-5272, Idaho Code, if this preliminary order becomes final, any party aggrieved by the final order or orders previously issued in this case may appeal the final order and all previously issued orders in this case to district court by filing a petition in the district court of the county in which:

- i. A hearing was held,
- ii. The final agency action was taken,
- iii. The party seeking review of the order resides, or
- iv. The real property or personal property that was the subject of the agency action is located.

The appeal must be filed within twenty-eight (28) days of this preliminary order becoming final. See section 67-5273, Idaho Code. The filing of an appeal to district court does not itself stay the effectiveness or enforcement of the order under appeal.

## MEMORANDUM

TO: Water Right File 63-31683

FROM: Daniel Nelson – Analyst 3

DATE: October 11, 2017

SUBJECT: Licensing Review of Water Right 63-31683

This field exam was performed by Certified Field Examiner Terry Scanlan of SPF Water Engineering. Mr. Scanlan reported that 0.20 cfs, 45 af, and 10 acres were developed for irrigation purposes. This the same amount requested in the permit. There are a couple of issues that need to be addressed. Each will be addressed below:

### **History:**

This permit was originally filed as a single application for permit for 30 acre of irrigation, domestic use, stockwater storage, wildlife storage, and diversion to storage. This permit was filed at a time when mitigation was required to move forward with the processing of an application for permit while the Treasure Valley Hydrological Study was being completed. The permit holder was able to supply mitigation for a 10 acre portion of the irrigation right, so they split the application for permit and moved forward with the permitting of this portion of the original application.

Processing of the remaining portion of the permit (63-31864) has resumed, but an extension of time to provide proof of beneficial use was filed and proof of completion is not due until May 1, 2018.

An extension of time to provide proof of beneficial use was filed for this permit (63-31683) in 2008, and the date to provide proof of beneficial use was extended to June 1, 2013. Proof of beneficial use was submitted on May 30, 2013.

### **Points of Diversion:**

Mr. Scanlan located the point of diversion on an aerial photo in the SENE of Section 12, Township 2 North, Range 1 East. There is nothing in the file that would lead me to dispute Mr. Scanlan's placement of the point of diversion. Therefore, I will use the point of diversion recommended by Mr. Scanlan. The well was drilled prior to the requirement of well drillers using GPS to locate the well, so the well driller's report is not helpful.

**Place of Use:**

Mr. Scanlan provided a reasonably good representation of the place of use based on his description of the water use. However, the aerial imagery suggests that only 7.6 acres were actually irrigated instead of the 10 acres Mr. Scanlan recommended. Mr. Scanlan stated that approximately 4.4 acres were irrigated in the pasture north of the arena, but the imagery only supports the irrigation of approximately 2.0 acres in the north pasture. Mr. Scanlan realized that the aerial imagery didn't support the claimed 10 acres of irrigation, and had the permit holders sign an affidavit that they did irrigate the entire 4.4 acre north pasture in May of 2013.

I have attached a series of maps to this memo showing aerial photos and LanSat satellite imagery. These images do not provide proof that the pasture was actually irrigated in May of 2013. However, they do suggest that some irrigation occurred in August and September of 2013. This could be reasonable dependent on when the pasture was planted. If the pasture was planted in May of that year, then irrigation wouldn't show up in the LanSat imagery. The LanSat imagery does show that some irrigation of the north pasture took place in August of 2013, and a greater area was irrigated in September of 2013.

With the imagery that is available and the Affidavit, I am inclined to allow the full 10 acres of irrigation. The proof of irrigation was later in the year, but I can't definitely say from the imagery and the wording on the statement that the entire pasture was not planted and irrigated in May. There is definite proof that 7.6 acres were irrigated in August, and the September 2013 LanSat photo does suggest that the entire pasture could have been irrigated in 2013. Therefore, I am recommending this permit be licensed for 10 acres of irrigation.

**Diversion Rate:**

Mr. Scanlan originally measured this system using the time fill method. However, this measurement was based on an open discharge measurement, and not on a pressurized system. The Administrative IDAPA rules require that the measurement be taken during normal operating conditions. I emailed Mr. Scanlan on October 11, 2017 asking for additional information.

Mr. Scanlan provided additional information to justify the measurement on October 12, 2017. Mr. Scanlan clarified that there are actually 2 pumps providing water to the irrigation system instead of the single pump that I originally thought was in use. Mr. Scanlan then went through a theoretical analysis of the system that confirmed that the system would operate at the diversion rate permitted.

After reviewing Mr. Scanlan's calculations, it appeared as though he tried to error on the side of caution when calculating the Total Dynamic Head (TDH). However, he did use a very low pressure for a sprinkler system of 45 psi. This is usually the minimum pressure it takes to allow rainbird type sprinklers to operate correctly. However, I also discovered that there was quite a bit of elevation drop from the well location to the northern end of the sprinkler line, so the pressure might have actually increased through the system due to the elevation difference.

With Mr. Scanlan's theoretical calculation supporting is measurement, I feel comfortable recommending a diversion rate of 0.20 cfs for this permit.

#### **Diversion Volume:**

Mr. Scanlan recommended a diversion volume of 45 af. Mr/ Scanlan's calculations appear to be reasonable and accurate for the normal irrigation of 10 acres. I am concerned that the back 4.4 acre pasture is not currently being irrigated normally. However, the remaining system appears to be irrigated at the normal annual volume rate of 4.5 af per acre. It would be cumbersome to limit a portion of the irrigation system to one volume per acre and the remainder of the irrigation system to another volume per acre. If the property is ever sold or reworked, this would require a new permit to bring the north pasture up to the standard irrigation volume. I don't think it is reasonable to vary the volume rate per acre between the different pastures, therefore, I am recommending that Mr. Scanlan's diversion volume of 45 af be used for licensing.

#### **Overlap:**

Suez Untied Water overlaps the place of use, but this permit should not be affected by the municipal water use. The field report stated that they are not connected into a municipal system.

The other portion of the original split 63-31684 does overlap this permit. This permit plans to use the same well to irrigate the remaining 30 acres in the tract and provide a pond. The pond and the 30 acres have not been developed yet, so there is no way to determine how 63-31684 will affect this permit until development has been completed. There should be no need at this time to include any combined limitations on license for this permit. When 63-31684 is field examined and licensed, any need for combined limitations can be placed on 63-31684 if needed.

Water right license 63-10526 overlaps the place of use. This right is for domestic use. The water is used to provide water to the home and to provide stockwater for property. The original point of diversion is no longer being used, and it is now being diverted out the point of diversion associated with this permit. According to the field examiner, the domestic well has sanded in, and the permit holder is no longer able to use the original well. The original well was in the same 40 acre tract, so a transfer would not be needed for water right 63-10526. The domestic portion of 63-10526 did include an irrigation component for the yard, but the old home is no longer at the property, and a new home has been built. The entire property has changed considerably from the field exam for 63-10526. Therefore it is impossible to determine from the 1990's aerial photos where the domestic irrigation was located. A condition will need to be added to limit the total irrigation for this property to 10 acres.

**Conditions:**

Conditions 1 (046) and 3 (26A) should be removed at licensing as is standard. Condition 2 should not be carried forward to licensing, since it is outside the boundaries of the Basin 63 Ground Water Restricted area. It should be noted that they did drill the well within the water bearing zone requested in the permit, so they did comply with condition 2 on the permit.

The permit holder did formally abandon the portion of the mitigation right as required in condition 4 of the permit. The portion of the mitigation right was formally abandoned, so this condition does not need to be carried forward to licensing. There is not another standard condition that should replace condition 4 of this permit, and I didn't feel there was need to create a non-standard condition stating that they had accomplished the mitigation by formally abandoning the mitigating right.

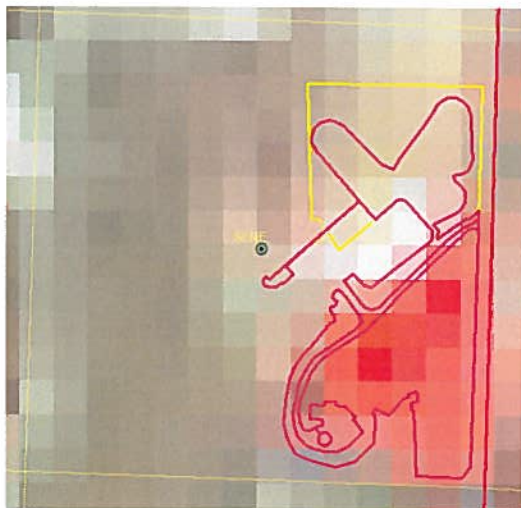
Conditions 5 (R65) and 6 (01M) should be carried forward to licensing. No additional combined limitation conditions with permit 63-31864 should be needed on this permit. A condition will need for combined water use with 63-10526 that states the following:

When the irrigation component of the domestic use under right 63-10526 is combined with right 63-31683 they shall not exceed the irrigation of 10 acres.

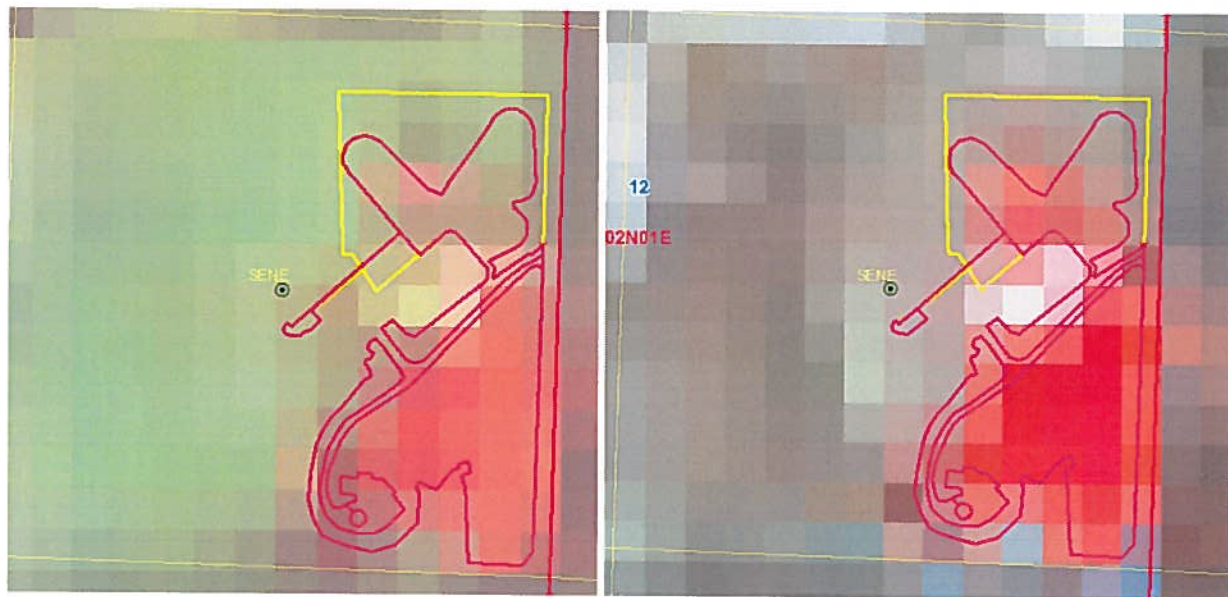
# Permit 63-31683 – Licensing Review Maps – Proof of Irrigation



The aerial image above left is the 2017 Google Earth image of this property. You can see several circles north of the arena that appear to be active irrigation. In the aerial image above right is the 2013 aerial image from the Department's records. You can see several lines of the circle sprinklers heading north from the arena. The permit holder signed an affidavit that they irrigated the ground in May of 2013. The May, 2013 LandSat aerial image shows a slight distinction from the field to the west, but it really doesn't provide proof of actual irrigation. The permit holder could have just planted the field, and irrigation may not be noticeable the LanSat imagery during the month of May. On the map bottom right, the purple border shows the ground that appears to be irrigated from the aerial photos. I could confirm that 7.6 acres irrigated could have been irrigated from the aerial photos, but I couldn't confirm that the entire 10 acres had been irrigated. Therefore, I then took a closer look at the LanSat images throughout the year (please see next page).



I was able to find evidence of irrigation in the Satellite imagery using the LanSat imagery from August and September, 2013. This imagery does suggest that some irrigation did take place in the north pasture in August when the aerial photo was taken. The image below left was from August the same month that the aerial photos were taken, and the LanSat image confirms the irrigation shown in the aerial photos. The Image below right is from November of 2013, which shows significantly more irrigation. The November image suggests that more land was irrigated after the August 2013, aerial photo was taken. The Affidavit in the field report says, the area is only used during the spring and fall. If they planted the pasture in the spring, pasture growth wouldn't show up until later in the year. If they didn't irrigate during the summer months, then the pasture wouldn't come on until later in the year after they started irrigating again. I can't confirm or deny that entire north pasture was irrigated based on the imagery available, but it is reasonable to conclude that more of the pasture was irrigated after the aerial photo was taken.



**Nelson, Dan**

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**From:** Nelson, Dan  
**Sent:** Friday, October 13, 2017 10:15 AM  
**To:** 'Terry Scanlan'  
**Subject:** RE: Permit 63-34683

Hi Terry,

The information on the well was great. I misread your narrative. I thought the 1.5 Hp pump was in the house well that was no longer used instead of being in the 8 inch well with the 7.5 Hp pump. When you add the two pumps together, everything makes much more sense. I was a bit concerned when I originally read your analysis below, since 45 psi is a bare minimum for sprinkler operation. Especially if you are running more than one sprinkler. I have personally tried to charge up sprinkler lines when the pressure was below 45 psi and you really have to work at it to get the sprinklers to work properly. However, I took a second look at the topography of the area, and it looks like the north pasture is approximately 20 feet lower in elevation than the well location, so that would add an additional 8 psi of pressure in the system. 45 psi at the sprinkler head is really the magic number when trying to get sprinklers to work properly. Once you hit that number everything is great, but more you get below that number, the more difficult it is to get things to work properly. The extra boost from the elevation variation should be enough to make things work well at that diversion rate.

As I stated in my earlier email, the April 2013, LanSat Satellite image may be enough to tip the scales to allow the 10 acres of irrigation. I just wish they would have continued irrigating all year long, so it showed up in aerial photography. I was able to confirm 7.6 acres with the aerial photography available in our database and Google Earth, so I am hoping I can at least give them that much irrigation. I have read up on the traveling sprinkler system they have, and it should be able to have easily made the entire pasture lush and green, so they had the equipment to make it work.

The mitigation right that was abandoned cannot be the deciding factor in this circumstance, but they could refile on the acres not covered. I would have to find out what it would take to resurrect the portion of the right that was abandoned and is no longer needed, but it might be worth it to pursue that aspect later if we can't get the full 10 acres included in this right. If we can resurrect the right, then they may be able to sell it and recoup some of their costs.

Once again, thank you for the information Terry. I appreciate the help. I will move forward with getting this right licensed. We are starting to fire back up the Water Supply Bank processing, so the workload is backed up a bit right now, but I will try to push it through as quickly as possible. Please don't hesitate to contact me if you have any questions.

Daniel Nelson  
Water Right Analyst 3  
Idaho Department of Water Resources  
Telephone (208) 287-4856  
Fax (208) 287-6700 (attn: Dan Nelson)

**From:** Terry Scanlan [mailto:TScanlan@spfwater.com]  
**Sent:** Thursday, October 12, 2017 5:45 PM  
**To:** Nelson, Dan <Dan.Nelson@idwr.idaho.gov>  
**Cc:** Lori Graves <LGraves@spfwater.com>  
**Subject:** RE: Permit 63-34683

Dan –

Regarding the area irrigated, that is the best information that I have. I agree that the photographic data is not adequate to justify the full 10 acres. I could see in the field where they had the ability to irrigate the full 10 acres based on mainline location, and the permit holders were adamant that they had hit everything, so that is why I asked for the sworn statement. The other mitigating factor is that they purchased and retired a 10-acre licensed groundwater right to mitigate for the 10-acre permit. So I am hopeful that the Department can take that into account. I'll accept what the Department determines is appropriate.

Regarding the flow measurement, I was a little surprised at how high it was also. In retrospect, I should have valved it back to raise the pressure a little higher for a second measurement. However, I think I figured that we were so much above the 0.20 cfs permit limit that it didn't matter. The system has installed motor capacity of 9.0 hp (7.5 + 1.5). These smaller submersibles are typically designed to operate into the service factors (1.15 for 7.5 hp and 1.3 for 1.5 hp) which gets us up to as high as 10.6 hp. The 45 psi measured at 131 gpm works out to about 229 feet TDH (i.e., 104 feet discharge pressure, plus 105 feet static, plus 10 feet drawdown, plus 10 feet head loss). Assuming a pump efficiency of 72%, I get 10.5 hp requirement (i.e.  $(131 \times 229) / (3960 \times 0.72) = 10.5$  hp)). So it is theoretically possible, although I admit difficult. For 90 gpm (0.20 cfs), it is easier. I have attached example pump curves to illustrate. The 7.5 hp pump is rated to produce 76 gpm at 260 feet TDH and the 1.5 hp pump is rated to produce 16 gpm at 260 feet TDH. In combination, they should produce 93 gpm at 260 feet TDH. At the listed 64% efficiency for the 7.5 hp pump curve and an assumed 60% efficiency for the 1.5 hp pump, these pumps would be pulling 7.8 hp and 1.75 hp, respectively, which are barely into the service factors and are within the expected loads for this type of pump.

There is no exposed pipe for a flow meter. Let me know if the explanation above is adequate for flow rate, or if I need to go back and measure the output from individual sprinklers.

Terry

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**From:** Nelson, Dan [mailto:Dan.Nelson@idwr.idaho.gov]  
**Sent:** Wednesday, October 11, 2017 3:23 PM  
**To:** Terry Scanlan <TScanlan@spfwater.com>  
**Cc:** Lori Graves <LGraves@spfwater.com>  
**Subject:** Permit 663-34683

Hello Terry,

I am reviewing your field exam for water right 63-31683. I found a couple of things that are concerning, but I think we can work through them.

#### **Area Irrigated:**

The acres irrigated in the pasture north of the arena. Even with the sworn statement from the permit holders, I need to be able to confirm the extent of irrigation that actually occurred. In reviewing the aerial and satellite photos, I am struggling to see the entire pasture being irrigated. With the aerial and satellite imagery available to us, I can easily see approximately 2 of the 4.4 acres being irrigated. However, it is very difficult to confirm if the other 2.4 acres were actually irrigated. I have a satellite image for April of 2013 that I am going to try to

use, but if there is anything else you can give me to show the full 4.4 acres were being irrigated, it would definitely help to ensure the entire 4.4 acre pasture is covered. At this point, I can't guarantee we can allow more than the 2 acres of irrigation in that pasture without some real conclusive evidence. I will do my best on this issue, but I can't guarantee that my best will be good enough. If you come across anything else, please let me know.

### **Diversion Rate:**

I am struggling with in the permit is the measurement. The State of Idaho Administrative Rules (IDAPA) are very clear on how a system should be measured. The following on the rules in question:

#### **IDAPA Beneficial Use Rule 37.03.02.040.02 – (Highlights Added):**

**Rate of Diversion.** The rate of diversion measurement shall be conducted as close as reasonably possible to the source of supply and shall be measured with the project works fully in place operating at normal capacity. For example, if a sprinkler system is used for irrigation purposes, discharge from the pump must be measured with the sprinkler system connected.

#### **IDAPA Beneficial Use Rule 37.03.02.040.03 – (Highlights Added):**

**Measurements.** Water measurements may be made by vessel, weir, meter, rated flume, reservoir capacity table or other standard method of measurement acceptable to the Director. The field report shall describe the method used in making the measurement, the date when made, the name of the person making the measurement, the legal description of the location where the measurement was taken and shall include sufficient information, including current meter notes, rating tables, and/or calibration information to enable the Director to check the quantity of water measured in each case.

#### **IDAPA Beneficial Use Rule 37.03.02.040.04 – (Highlights Added):**

**Unacceptable Measurements.** Theoretical diversion rates or theoretical carrying capacities are not acceptable as a measure of the rate of diversion except as indicated in these rules and for some diversion systems where the flow rate cannot be measured accurately due to the physical characteristics of the diversion and distribution system.

In your measurement, you used an open discharge – timed fill measurement, and then described the system as being a pressurized sprinkler system. When you have used the time fill method in the past, you have supplied theoretical calculations and comparisons from the measurement pressure to the operational pressure to insure the measurement is correct. However, on this specific permit, you didn't make those comparisons. I ran these numbers through the theoretical formula, and found the numbers you gave didn't agree with the theoretical formula. Using the 70% efficiency that is considered standard in the Department, I found that pressure you listed at open discharge against the pump of 45 psi wasn't feasible. I also used a standard estimate of 10 feet of drawdown plus static water level to determine the lift. I found that a pressure of 20 psi was probably more likely. It generally takes a minimum of 45 psi to operate a sprinkler, so when you compare the open discharge measurement with an additional 45 psi, the diversion rate drops to around 0.17 cfs. You have been very good in the past to enough additional information that we could determine what a time fill method would do under normal operating conditions. However, there doesn't appear to be enough pump to divert the 0.20 cfs under pressure. Please provide me with something I can use to give them the full 0.20 cfs diversion rate. My recommendation would be to use the sprinkler method or a flow meter to get the flow rate for this system when it is under normal operating conditions.

Generally, most measurements on these big gun systems with a buried mainline are done by measuring the pressure at each sprinkler head and using the rating table for nozzle to determine the flow rate of each sprinkler and add the flow rates from each sprinkler together. This method is known as the sprinkler method, and you do need to include the sprinkler rating table. You have submitted several field exams in the last few months where you have used the time fill method at the pump. In the majority of those field exams, the measurement was acceptable because they were for open discharge into a pond. You also used this method for some irrigation uses, but on these field reports you provided calculations comparing the measurement to normal operating conditions, or you had system data that showed the designed irrigation flow. You can only use the time fill method for those times when the pump is open discharging into a pond or vault. I have used the time fill method on a pressure system by putting a hose or tube on the sprinkler and use the time fill method to calculate the flow of the sprinklers being used. Measuring flows small pipe is always difficult, but I have found the sprinkler method is often the best method to use if you have a rating table on the sprinklers.

### **Conclusion:**

I was unable to confirm without a doubt that the entire 4.4 acres you recommended north of the arena was irrigated, but I will do what I can with the information that you submitted. I do believe that you supplied all of the information that you could to show the system was irrigated, but I wanted to give you another chance to see if there are any photos showing the entire field green in 2013.

It does look like you went to extreme effort to get a measurement for this system. Unfortunately, that measurement wasn't at normal operating conditions. For systems diverting directly into a pressurized system, we need to have a measurement of the system if possible. If a measurement isn't possible, then you can do a theoretical calculation. For sprinkler systems, measuring the pressure on the sprinkler system and downloading the rating table for that sprinkler from the internet is an acceptable measurement according to the rules. The time fill method you used, was not acceptable, because it wasn't done at normal operating conditions. There is normally a 45 to 60 psi increase in pressure from an open discharge system to a pressurized irrigation system which reduces the flow rate.

This field exam was difficult, because it appears as though the system was only completely functional for a very short time in 2013. You did a very good job on this field exam, it is just one of those situations that need a bit more information to have it all make sense. If you can supply me with the flow rate measurements with the next 30 days, I would appreciate it. I don't know if there is anything you can do that provides a clearer picture of exactly what was irrigated in that northern pasture in 2013, but I would appreciate any help you can give me on that issue as well.

Thank you Terry. If you have any questions, please don't hesitate to give me a call.

Daniel Nelson  
Water Right Analyst 3  
Idaho Department of Water Resources  
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# Model 16S

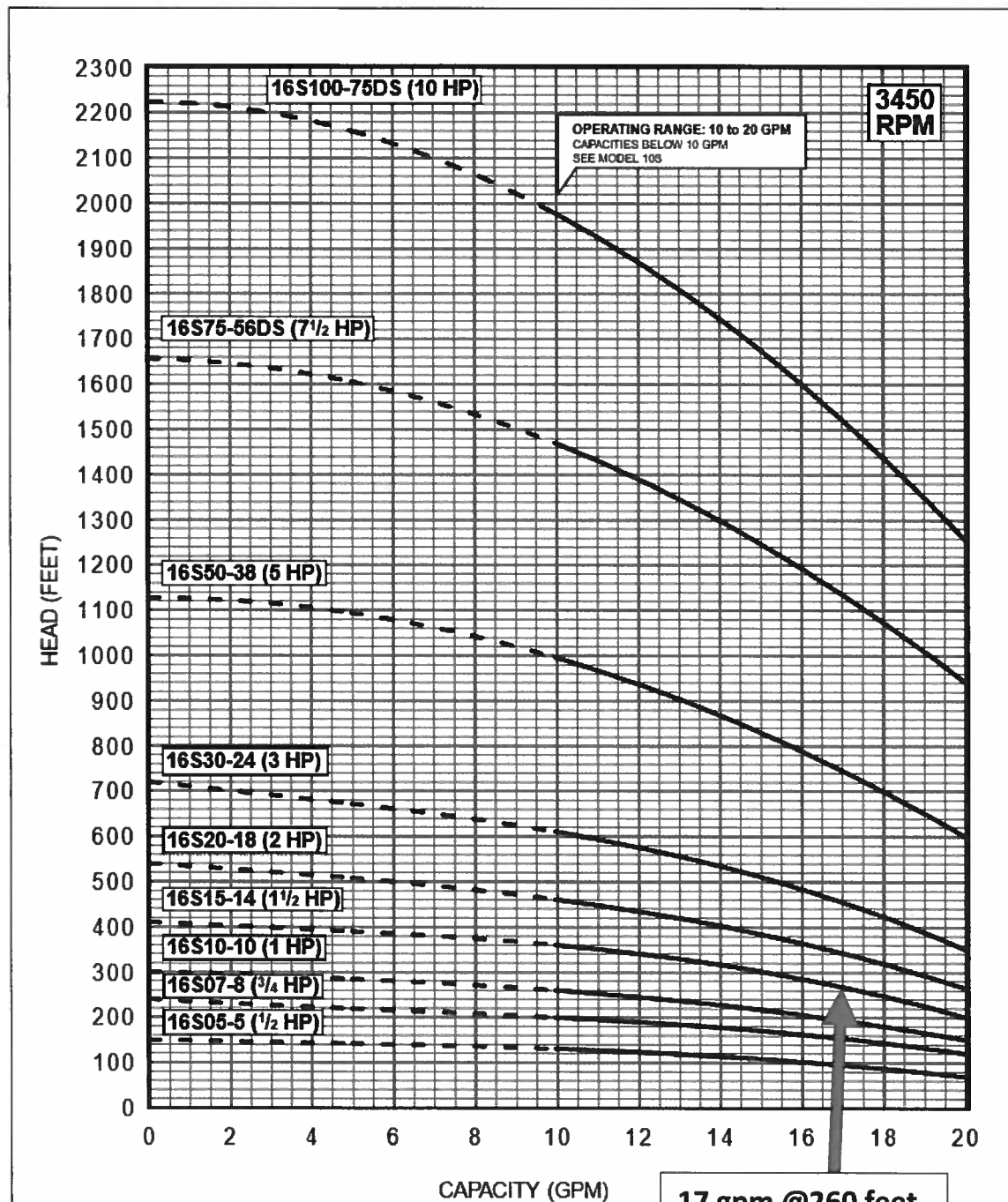
# 16 GPM

# Performance Curves

FLOW RANGE: 10 -20 GPM

OUTLET SIZE: 1 1/4" NPT

NOMINAL DIA. 4"



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.  
4" MOTOR STANDARD, 5-5 HP/3450 RPM.  
6" MOTOR STANDARD, 7.5-10HP/3450 RPM.

17 gpm @260 feet

@ 2 ft. min. submergence.

48 Annex B



# SUBMERSIBLE PUMPS

6" STAINLESS STEEL SR SERIES



## PERFORMANCE

70 GPM

