



RECEIVED

JAN 10 2014

WATER RESOURCES
WESTERN REGION

January 9, 2014

John Westra
Idaho Department of Water Resources
2735 Airport Way
Boise, ID 83705

Subject: (1) Beneficial Use Field Examination for Permit 65-22705,
(2) Aquifer Pumping Test Results for Permit 65-22705, and
(3) Request for Change in Permit 65-22705 Conditions 6, 7, 8, and 12

Dear John:

McCall River Ranch Company submitted proof of beneficial use for permit 65-22705 on July 24, 2013. Subsequently, SPF Water Engineering conducted an aquifer pumping test and a beneficial use field examination for purposes of licensing 65-22705. Based on the results of the aquifer pumping test, this letter requests that the conditions 6, 7, 8, and 12 of the permit be eliminated from the eventual license.

Details of this work are provided below.

BENEFICIAL USE FIELD EXAMINATION

The beneficial use field examination was conducted by Scott King, P.E., certified water right examiner No. 133. The examination is enclosed as Attachment A.

The examination recommends the permit for licensing as follows.

<u>Beneficial Use</u>	<u>Period of Use</u>	<u>Rate of Diversion</u>	<u>Annual Volume</u>
Irrigation	4/15 to 10/31	1.26 cfs	437.4 AF
Irrigation from Storage	4/15 to 10/31		91.2 AF
Diversion to Storage	1/1 to 12/31	1.26 cfs	
Irrigation Storage	1/1 to 12/31		91.2 AF
Recreation Storage	1/1 to 12/31		91.2 AF
Aesthetic Storage	1/1 to 12/31		91.2 AF

Point of Diversion: One well in the SE1/4 NE1/4 Section 20, T18N, R3E

Place of Use for Irrigation: 145.8 acres

AQUIFER PUMPING TEST

An aquifer pumping test was conducted over a 4-day period from September 10 through September 14, 2013 to evaluate the interconnection of the deep aquifer (tapped by the 65-22705 point of diversion) with the local shallow aquifer. The shallow aquifer is tapped by local domestic wells and is presumed to be in direct hydraulic connection with the North Fork Payette River.

Pumping Well. The pumping well for the test was the McCall River Ranch Well, the point of diversion for permit 65-22705, located in the SE1/4 NE1/4 Section 20, T18N, R3E. The well is constructed to a total depth of 480 feet, with 12-inch casing to 238 feet, 8-inch casing from 238 to 382 feet, 8-inch well screen from 382 to 422 feet, 6-inch casing from 422 to 440 feet, and 6-inch well screen from 440 to 480 feet. A bentonite surface seal extends from ground surface to a depth of 365 feet.

Hydrogeology. The River Ranch well taps coarse-grained sand and pea gravel aquifer layers below 350 feet depth. These layers are hydraulically isolated from the overlying shallow aquifer by a 170-foot thickness of gray clay that extends from 172 to 342 feet depth.

Estimated surface elevation at the River Ranch well is 5008 feet (Google Earth). The North Fork Payette River is approximately 0.4 miles to the northwest at elevation 4925 feet, 83 feet below the well head. Therefore, the top of the confining layer is approximately 90 feet below the river elevation, and the bottom of the confining layer is approximate 260 feet below the river elevation.

Well Pump. The well pump is a 60-hp submersible set at 380 feet on 5-inch diameter column pipe. The well pump has a nominal capacity of 500 gpm.

Observation Well. An observation well nest containing three separate wells is located approximately 940 feet northwest of the pumping well, approximately midway between the pumping well and the river. The well nest has a 2-inch well screened from 450 to 470 feet (*deep*), a 2-inch well screened from 150 to 170 feet (*intermediate*), and a 4-inch well screened from 80 to 100 feet (*shallow*). The deep 2-inch well monitors the aquifer tapped by the pumping well. The intermediate well is screened in the bottom of the shallow aquifer tapped by local domestic wells. The shallow well taps the upper portion of the shallow aquifer. The shallow aquifer is assumed to be an unconfined aquifer in direct hydraulic connection with the North Fork Payette River.

Pre-Test Water-Level Monitoring. Approximately 25 days prior to the pumping test, recording pressure transducers were installed in the deep and shallow monitoring wells. A recording barometer was also installed to compensate for barometric pressure fluctuations.

At the time of transducer installation, the water level in the deep well was approximately 10 feet lower than in the shallow and intermediate wells. Water levels in the deep aquifer increased over the first 15 days of this period, apparently a recovery from pumping of the production well in mid August. The deep aquifer water level was stable for approximately 10 days prior to the pumping test.

Water level in the shallow aquifer tapped by the upper well was stable throughout the pre-test period.

Immediately prior to the start of test pumping, water levels in all three wells were within 1 foot of each other, at approximately 53 feet below the top of the steel well casing. The top of the steel casing is approximately 2 feet above ground surface. There was a slight downward gradient apparent between the intermediate and shallow wells, based on a water-level difference of 0.6 feet. The intermediate and deep well water levels were within 0.07 feet of each other. Water level could not be measured in the pumping well due to an apparent obstruction in the well casing.

Pumping Period. Pumping began at 13:11 hours on September 10 and was terminated at 14:42 hours on September 14, 2013, a test duration of four days, 1 hour, and 31 minutes. Water from the well was pumped through buried pipe to a discharge point upstream from the River Ranch pond system. All discharge flowed to the River Ranch lined storage ponds.

Pumping rate during the initial part of the test was measured using a Portable Ultrasonic Time Flight Liquid Flow Meter (GE TransPort PT878). From approximately 13 to 23 minutes, the pumping rate averaged 566 gpm. Pumping rate during the remainder of the test was not measured, but was assumed to average approximately 500 gpm.

Water level in the deep observation well began declining within 20 minutes of the start of the test, and declined a total of 75 feet during the 4-day test period. There was no drawdown in the intermediate or shallow observation during the test period.

Analysis. The water level response in the deep aquifer suggests approximate transmissivity and storativity of 20,000 gpd/ft and 0.0005, respectively.

The lack of water level response in the shallow and intermediate observation wells demonstrate that the deep aquifer zone by the River Ranch well does not have a direct connection to the North Fork of the Payette River. As a result, pumping of the River Ranch well does not have a direct depletive effect on flows in the North Fork of the Payette River. Furthermore, pumping of the well does not have an adverse impact on domestic wells completed in the shallow aquifer zone above a depth of 200 feet.

Test data, including well driller reports, are provided as Attachment B. Due to the voluminous data set, transducer data are provided in graphical form only. Raw data are available upon request.

REQUEST FOR CHANGE IN PERMIT CONDITIONS 6, 7, 8, AND 12

The purpose of permit 65-22705 condition Nos. 6, 7, 8, and 12 is to protect existing domestic wells and senior Payette River water rights from impacts resulting from groundwater pumping under permit 65-22705. The permit conditions are listed below.

Condition No. 6. It is presumed that water diverted under this right is hydraulically connected to the ground water authorized for diversion under other water rights within the vicinity of the McCall airport, and it shall be conjunctively managed to protect the rights of senior ground water right holders. The Department may alter or remove this conjunctive management requirement if the right holder demonstrates that the wells used as points of diversion for this right have been constructed in such a manner that senior ground water right holders will not be injured by the diversion and use of water under this right.

Condition No. 7. Water withdrawals under this right shall be conjunctively managed with the delivery of surface water by the watermaster of State Water District No. 65 to prior water right holders receiving surface water from the Payette River and its tributaries. At any time prior to submitting proof of beneficial use in connection with this right, the right holder may petition the department to remove the conjunctive management requirement if it can be shown to the satisfaction of the department that the wells used as points of diversion have been constructed to such a depth and cased and sealed in such a manner that diversion and use of water under this right does not directly deplete the flow of water in the North Fork of the Payette River.

Condition No. 8. Prior to the diversion and use of water under this right, the right holder shall install and maintain acceptable totalizing measuring devices, including time-sensitive recording devices, at the authorized points of diversion, in accordance with Department specifications, or the right holder shall obtain an approved variance from the Department to use power records to determine the amount of water diverted. The right holder may petition the Department for a waiver of this condition if the conjunctive management requirement is removed from this right.

Condition No. 12. When water is not available to fill this right, the right holder shall cease diversion, shall rent water from the Payette River Rental Pool, or shall otherwise mitigate the depletion of water caused by this water use.

On behalf of McCall River Ranch, this letter requests that the above conditions be eliminated from any license issued for permit 65-22705. Reasons for this request are provided below.

- Condition No. 6 should be removed because testing shows no potential for injury to senior ground water right holders.
- Condition No. 7 should be removed because testing shows that diversion and use of water under this permit does not directly deplete the flow of water in the North Fork Payette River.
- Conditions No. 8 and 12 can be waived if the conjunctive management requirements under conditions No. 6 and 7 are removed.

In lieu of the four conditions above, a water-bearing interval of 300 to 600 feet is recommended to protect existing water rights in the event of future well replacement.

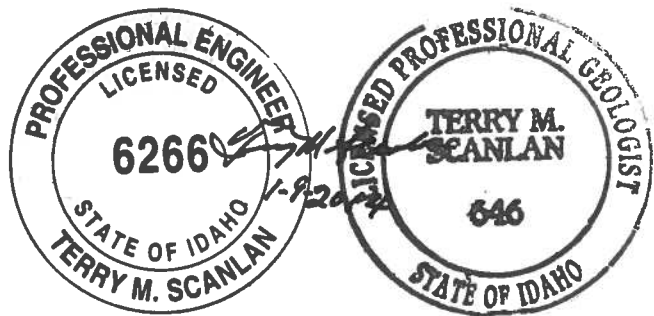
Please contact me with any questions.

Sincerely,



Terry M. Scanlan, P.E., P.G.

Cc: Judd DeBoer – McCall River Ranch



Attachment A – Beneficial Use Field Examination for Permit 65-22705

Attachment B – Aquifer Pumping Test Data

Attachment A
Beneficial Use Field Examination for Permit
65-22705

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

RECEIVED

JAN 10 2014

WATER RESOURCES
WESTERN REGION

A Beneficial Use Field Report is prepared by a water right examiner as the result of an examination to clearly confirm and establish the extent of the beneficial use of water established in connection with a permit during the development period authorized by the permit and any extensions of time previously approved.

A. GENERAL INFORMATIONPermit No. 65-227051. Owner McCall River Ranch Co.Phone No. 208-342-7883Current address c/o Judd DeBoer, 533 E. Riverside Drive, Suite 120, Eagle, ID 836162. Examiner's name Scott King, Certified Water Right Examiner 133EXAM DATE 9/10/20133. Accompanied by Kevin Hart

Email _____

Address 1985 Carr St, Lakewood, CO 80214Relationship to permit holder Operations ManagerPhone No. 303-453-97454. Source Ground Water

tributary to _____

B. OVERLAP REVIEW1. Other water rights with the same place of use Lake Irrigation District: 65-3218, 65-3219A, 65-3219X2. Other water rights with the same source and point of diversion None**C. DIVERSION AND DELIVERY SYSTEM**

1. Point(s) of Diversion:

Ident. No.	Gov't Lot	¼	¼	¼	Sec	Twp	Rge	County	Method of Determination/Remarks
1			SE	NE	20	18N	3E	Valley	Field Exam, GPS
									D0038988
									44.883999N / 116.106381W WGS84

2. Place(s) of Use:

Method of determination Field Exam, 2011 Aerial Photo

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
18N	3E	20		L1							L5								
			11	8	24	28					9			0.2	24	32	9	0.6	145.8
			X			X									X	X	X		

Irrigation from Storage place of use same as Irrigation place of use

X = Recreation, Recreation Storage, Aesthetic, Aesthetic Storage and Irrigation Storage place of use

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe diameter (inside), as applicable. Use the space provided or ☒ see attached.

Scale: 1" = _____

- ☒ Copy of USGS Quadrangle attached showing location(s) of point(s) of diversion and place(s) of use (**required**)
☒ Aerial photo attached (required for irrigation of 10+ acres)
☒ 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
12-inch well (D0038988)	unknown	60	unknown	Goulds 7 CHC 5	unknown

*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
Portable Ultrasonic Flow Meter	Ultrasonic	GE	PT878	7140	various	3/27/2013

2. **Measurements:** _____
 Measured well pump discharge at 566 gpm (1.26 cfs)

E. NARRATIVE/REMARKS/COMMENTS

The irrigation well water is typically piped to the bubbler at the northeast corner of the place of use (Section 20 NENE) and flows southwesterly through the series of ponds. Lake Irrigation District surface water enters the system through this same bubbler. The main 75-hp irrigation booster pump in Section 22 SWSE diverts from the lower pond to the pressurized irrigation (PI) system, and also diverts to the bubbler in Section 20 NENE to provide recirculation through the pond system. The 100-hp secondary irrigation pump in Section 20 NESE diverts from the large intermediate pond into the PI system.

Well pump discharge was measured in the well pump house by excavating a section of the discharge pipe (see photos).

Has the permit holder met all conditions of permit approval, including any mitigation requirements and/or measuring device installation requirements? ☒ Yes ☐ No If no, what must be done to meet the permit requirements?

See Terry Scanlan's cover letter regarding conditions 6, 7, 8 and 12.

The well constructed as a point of diversion is more than 1/4 mile distant than the nearest domestic well (Condition #5).

F. FLOW CALCULATIONS☒ Additional computation sheets attached

Measured Method:

Panametrics portable ultrasonic flowmeter used to measure well pump discharge of 1.26 cfs.

G. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 145.8 \times 3 = 437.4$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation Season}) \times 1.9835 = 1.26 \times 200 \times 1.9835 = 499.8$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 437.4$$

2. Volume Calculations for Other Uses:

Total pond volume: See attached pond capacity calculations sheet. Storage capacity calculated at 91.2 acre-feet.

H. RECOMMENDATIONS

1. Recommended Amounts

Beneficial Use	Period of Use		Rate of Diversion Q (cfs)	Annual Volume V (afa)
	From	To		
Irrigation	4/15	10/31	1.26 cfs	437.4 afa
Irrigation from storage	4/15	10/31		91.2 afa storage
Irrig., rec., aesth. storage	1/1	12/31		91.2 afa storage
Diversion to storage, rec., aesth.	1/1	12/31	1.26 cfs	
	1/1	12/31		
Totals:			1.26 cfs	528.6 afa

2. Recommended Amendments

☒ Change P.D. as reflected on page 1☐ Add P.D. as reflected on page 1☐ None☒ Change P.U. as reflected on page 1☐ Add P.U. as reflected on page 1☐ Other**I. AUTHENTICATION**

Field Examiner's Signature

Scott N. King

Date

1/8/2014

Reviewer

Date



ATTACHMENT A

PERMIT RECORD AND PROOF OF BENEFICIAL USE

RECEIVED

JAN 10 2014

WATER RESOURCES
WESTERN REGION

Page 1

State of Idaho
Department of Water Resources
Permit to Appropriate Water

NO. 65-22705

Priority: July 10, 2002

Maximum Diversion Rate. 6 00 CFS

This is to certify, that MC CALL RIVER RANCH CO
PO BOX 886
MC CALL ID 83638-0886

has applied for a permit to appropriate water from:

Source: GROUND WATER

and a permit is APPROVED for development of water as follows:

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>RATE OF DIVERSION</u>	<u>ANNUAL VOLUME</u>
IRRIGATION	04/15 to 10/31	6.00 CFS	
IRRIGATION FROM STORAGE	04/15 to 10/31		250.0 AF
IRRIGATION STORAGE	01/01 to 12/31		250 0 AF
DIVERSION TO STORAGE	01/01 to 12/31	6.00 CFS	
RECREATION	01/01 to 12/31	2.00 CFS	
RECREATION STORAGE	01/01 to 12/31		250 0 AF
AESTHETIC	01/01 to 12/31	2 00 CFS	
AESTHETIC STORAGE	01/01 to 12/31		250 0 AF

LOCATION OF POINT(S) OF DIVERSION:

GROUND WATER	SW $\frac{1}{4}$ NE $\frac{1}{4}$	Sec. 20, Twp 18N, Rge 03E, B.M.	VALLEY County
GROUND WATER	SE $\frac{1}{4}$ NE $\frac{1}{4}$	Sec. 20, Twp 18N, Rge 03E, B.M.	VALLEY County
GROUND WATER	SE $\frac{1}{4}$ SW $\frac{1}{4}$	Sec. 20, Twp 18N, Rge 03E, B.M.	VALLEY County
GROUND WATER	NW $\frac{1}{4}$ SE $\frac{1}{4}$	Sec. 20, Twp 18N, Rge 03E, B.M.	VALLEY County
GROUND WATER	SW $\frac{1}{4}$ SE $\frac{1}{4}$	Sec. 20, Twp 18N, Rge 03E, B.M.	VALLEY County
GROUND WATER	NE $\frac{1}{4}$ NW $\frac{1}{4}$	Sec. 29, Twp 18N, Rge 03E, B.M.	VALLEY County
GROUND WATER	NE $\frac{1}{4}$ NE $\frac{1}{4}$	Sec. 20, Twp 18N, Rge 03E, B.M.	VALLEY County
GROUND WATER	SW $\frac{1}{4}$ NW $\frac{1}{4}$	Sec. 29, Twp 18N, Rge 03E, B.M.	VALLEY 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	
18N	03E	20	12.0	5.0	24.0	30.0					25.0		25.0	38.0	10.0	38.0	30.0		237.0
18N	03E	29		10.0			35.0	32.0	35.0	28.0	3.0	20.0							163.0

Total Acres: 400

PLACE OF USE: IRRIGATION FROM STORAGE -- Same as Irrigation

MICROFILMED

MAR 22 2004

State of Idaho
Department of Water Resources
Permit to Appropriate Water
NO. 65-22705

PLACE OF USE: IRRIGATION 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	
18N 03E 20	X	X	X	X					X		X	X	X	X	X		
		L 3															
18N 03E 29		X			X	X	X	X	X	X							

PLACE OF USE: RECREATION, RECREATION STORAGE, AESTHETIC, AND AESTHETIC STORAGE – Same as Irrigation Storage

CONDITIONS OF APPROVAL

1. Proof of application of water to beneficial use shall be submitted on or before **August 1, 2008**.
2. Subject to all prior water rights.
3. Project construction shall commence within one year from the date of permit issuance and shall proceed diligently to completion unless it can be shown to the satisfaction of the Director of the Department of Water Resources that delays were due to circumstances over which permit holder had no control.
4. Right holder shall comply with the drilling permit requirements of Section 42-235, Idaho Code and applicable Well Construction Rules of the Department.
5. Wells constructed as points of diversion for this right shall not be constructed closer than 1/4 mile from existing domestic wells unless the permit holder apprises IDWR that the proposed well will be closer than 1/4 mile to an existing well and IDWR approves construction of the new well by finding, in writing, that the new well will not injure other water rights.
6. It is presumed that water diverted under this right is hydraulically connected to the ground water authorized for diversion under other water rights within the vicinity of the McCall airport, and it shall be conjunctively managed to protect the rights of senior ground water right holders. The Department may alter or remove this conjunctive management requirement if the right holder demonstrates that the wells used as points of diversion for this right have been constructed in such a manner that senior ground water right holders will not be injured by the diversion and use of water under this right.
7. Water withdrawals under this right shall be conjunctively managed with the delivery of surface water by the watermaster of State Water District No. 65 to prior water right holders receiving surface water from the Payette River and its tributaries. At any time prior to submitting proof of beneficial use in connection with this right, the right holder may petition the department to remove the conjunctive management requirement if it can be shown to the satisfaction of the department that the wells used as points of diversion have been constructed to such a depth and cased and sealed in such a manner that diversion and use of water under this right does not directly deplete the flow of water in the North Fork of the Payette River.
8. Prior to the diversion and use of water under this right, the right holder shall install and maintain acceptable totalizing measuring devices, including time-sensitive recording devices, at the authorized points of diversion, in accordance with Department specifications, or the right holder shall obtain an approved variance from the Department to use power records to determine the amount of water diverted. The right holder may petition the Department for a waiver of this condition if the conjunctive management requirement is removed from this right.

MICROFILMED

MAR 22 2004

State of Idaho
Department of Water Resources
Permit to Appropriate Water
NO. 65-22705

CONDITIONS OF APPROVAL CONTINUED

- 9 This right when combined with all other rights shall provide no more than 0.02 cfs per acre nor more than 3.0 afa per acre at the field headgate for irrigation of the lands above.
10. The right holder shall make full beneficial use of all surface water rights available to the right holder for irrigation of the lands authorized to be irrigated under this right. The right holder shall limit the diversion of ground water for irrigation under this right to those times when the surface water supply is not available or the surface water supply is not reasonably sufficient to irrigate the place of use authorized under this right
11. If the surface water right(s) appurtenant to the place of use is sold, transferred, leased or used on any other place of use, this right to divert groundwater shall not be used for irrigation purposes without an approved transfer pursuant to Section 42-222, Idaho Code, or approval of the Department if a transfer is not required.
12. When water is not available to fill this right, the right holder shall cease diversion, shall rent water from the Payette River Rental Pool, or shall otherwise mitigate the depletion of water caused by this water use.
- 13 The Director retains jurisdiction to require the right holder to provide purchased or leased natural flow or stored water to offset depletion of Lower Snake River flows if needed for salmon migration purposes. The amount of water required to be released into the Snake River or a tributary, if needed for this purpose, will be determined by the Director based upon the reduction in flow caused by the use of water pursuant to this permit.
14. Aesthetic and recreational uses will be for a series of ponds with a total capacity of 250 acre feet, and recreational use will include fishing.

This permit is issued pursuant to the provisions of Section 42-204, Idaho Code. Witness the signature of the Director, affixed at Boise, this 30th day of September, 2003.


KARL J DREHER, Director

MICROFILMED
MAR 22 2004

JAN 10 2014

WATER RESOURCES
WESTERN REGION

RECEIVED

JUL 24 2013

DEPARTMENT OF
WATER RESOURCESSTATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
STATEMENT OF COMPLETION
FOR SUBMITTING PROOF OF BENEFICIAL USE

FOR OFFICE USE ONLY	
Amt. of Fee \$:	125.00
Receipt No.:	1897529
Receipt By:	HP
Date Received:	7-24-13

The Idaho Department of Water Resources considers this form a statement by the permit holder(s) that development of a water right has been **completed** and that water has been applied to beneficial use to the extent described below. **This form must be accompanied by an examination fee, when necessary, or by a completed Beneficial Use Field Report prepared by a certified water right examiner.** Please refer to the instructions and fee schedule for this form. If ownership of the permit has changed, please contact any Department office or visit the Department's website at: www.idwr.idaho.gov for an *Assignment of Permit* form. If you wish to relinquish your permit because you have not established the authorized use of the water and are not applying for an extension, please notify the Department in writing.

- Permit No.: 65-22705 Telephone No.: 208-342-7883
- Name of Permit Holder(s): McCall River Ranch Co.
- Mailing Address: c/o Judd DeBoer, 533 E. Riverside Drive, Suite 120 City: Eagle
State: ID Zip: 83616 Email: judd@riverranchmccall.com
- Source of Water: Ground Water If **GROUND WATER** (well), Date Drilled: mo. May / yr. 2005
Well Driller: Riverside, Inc. Drilling Permit Number: 887753-832124
- Extent of use(s) completed (as authorized by the water right permit):
Domestic (No. of households): _____ Stockwater (No. and type of stock): _____
Irrigation (No. of acres): 145 Other: diversion to storage, recreation and aesthetic uses & storage, irrigation storage & from storage
- Total rate of diversion or storage volume for which proof is submitted: 1.5 cfs cfs OR 145.6 acre-feet.
- Compliance with a measuring device requirement, lockable controlling device requirement, and/or other conditions of permit: **Refer to the approval conditions on your permit and respond accordingly. The Department will not issue a license if permit conditions are not met.**

Measuring Device: Is a measuring device required?

If yes, has the measuring device been installed?

Yes ☒	No ☐
Yes ☒	No ☐

(installed flow sensor)

Lockable Controlling Device: Is a lockable device required to control the diversion?

If yes, has the lockable device been installed?

Yes ☐	No ☒
Yes ☐	No ☐

Other Conditions of Permit: Do the approval conditions on your permit require you to submit additional information in connection with your proof of beneficial use? If yes, list the conditions below and attach documents with the required information.

Completed?

Yes ☐	No ☒
------------------------------	--

- Fee Enclosed: \$ 125.00 See fee schedule on back of the instructions for filing proof of beneficial use. Proofs filed without an appropriate fee, will be considered incomplete.
- Person to contact to accompany the Department representative during field examination of the water system.
Name: Terry Scanlan, SPF Water Engineering Telephone Number: 208-383-4140
Mailing Address: 300 E. Mallard Dr., Ste 350 City: Boise
State: ID Zip: 83706 Email: tscanlan@spfwater.com

The information given on this form is my true statement of the extent to which the above numbered permit has been developed and water has been diverted and applied to a beneficial use. I understand that any undeveloped portion of the permit is relinquished to the State of Idaho.

Signature of permit holder:

Judd W. DeBoer, Secretary
(Include your title, if on behalf of company or organization)

Date:

7-19-13

Mail to: Idaho Department of Water Resources, PO Box 83720, Boise, ID 83720-0098

ATTACHMENT B

WELL DRILLERS' REPORT AND PUMP CURVE

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

1. WELL TAG NO. D 0038988
 DRILLING PERMIT NO. 887753-83 2124
 Water Right or Injection Well No. 65-22705

2. OWNER:

Name McCALL RIVER RANCH COMPANY
 Address P.O. Box 886
 City McCALL State ID Zip 83638

3. LOCATION OF WELL by legal description:

You must provide address or Lot, Blk, Sub. or Directions to well.

Twp. 18 North ☒ or South ☐
 Rge. 3 East ☒ or West ☐
 Sec. 20 1/4 SE 1/4 NE 1/4
 Gov't Lot _____
 County Valley

Lat: _____ Long: _____
 Address of Well Site WEST SIDE OF MISSION STREET

City McCALL
 (Give at least name of road + Distance to Road or Landmark)
 Lt. _____ Blk. _____ Sub. Name McCall River Ranch

4. USE:

☐ Domestic ☐ Municipal ☐ Monitor ☒ Irrigation
☐ Thermal ☐ Injection ☐ Other

5. TYPE OF WORK check all that apply (Replacement etc.)

☒ New Well ☐ Modify ☐ Abandonment ☐ Other

6. DRILL METHOD:

☐ Air Rotary ☐ Cable ☐ Mud Rotary ☒ Other REVERSE

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
<u>5% BENTONITE</u>	<u>0</u>	<u>365</u>	<u>30,000</u>	<u>DRY POUR</u>

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s) _____

Was drive shoe seal tested? ☐ Y ☒ N How? _____

8. CASING/LINER: REDUCER 12" to 8" @ 238'

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>12"</u>	<u>238</u>	<u>250</u>	<u>250</u>	<u>STEEL</u>	☒	☐	☒	☐
<u>8"</u>	<u>238</u>	<u>382</u>	<u>250</u>	<u>STEEL</u>	☒	☐	☒	☐
<u>6"</u>	<u>422</u>	<u>440</u>	<u>250</u>	<u>STEEL</u>	☒	☐	☒	☐

Length of Headpipe _____ Length of Tailpipe 2'

Packer ☐ Y ☒ N Type _____

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method _____

Screen Type & Method of Installation JOHNSON WIREWRAP

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
<u>382</u>	<u>422</u>	<u>.030</u>		<u>8"</u>	<u>S.S.</u>	☒	☐
<u>440</u>	<u>480</u>	<u>.030</u>		<u>6"</u>	<u>S.S.</u>	☒	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method
<u>6-9 SS SAND</u>	<u>365</u>	<u>504</u>	<u>12,000</u>	<u>DRY POUR</u>

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

502" ft. below ground Artesian pressure _____ lb.

Depth flow encountered _____ ft. Describe access port or control devices: _____

1 1/2" PIPE ON SIDE

832124
 Office Use Only
 Well ID No. 402717
 Inspected by _____
 Twp _____ Rge _____ Sec _____
 1/4 _____ 1/4 _____ 1/4 _____
 Lat: _____ : _____ : _____ Long: _____ : _____ : _____

12. WELL TESTS:

☒ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
<u>400 gpm</u>	<u>118</u>	<u>168' 9"</u>	<u>2 hr</u>

Water Temp. _____ Bottom hole temp. _____

Water Quality test or comments: _____

Depth first Water Encounter _____

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water	Y	N
<u>20"</u>	<u>0</u>	<u>4</u>	<u>TOP SOIL</u>			
<u>18"</u>	<u>4</u>	<u>112</u>	<u>FINE-COARSE SAND, PEA GRAVEL</u>			
<u>18"</u>	<u>112</u>	<u>114</u>	<u>BRN + GREEN CLAY</u>			
<u>18"</u>	<u>114</u>	<u>172</u>	<u>GREEN/GRAY SAND</u>			
<u>14"</u>	<u>172</u>	<u>342</u>	<u>STICKY GRAY CLAY</u>			
	<u>342</u>	<u>345</u>	<u>SANDY GRAY CLAY</u>			
	<u>345</u>	<u>362</u>	<u>COARSE SAND, GRAVEL</u>			
	<u>362</u>	<u>380</u>	<u>GRAY SANDY CLAY</u>			
	<u>380</u>	<u>404</u>	<u>COARSE SAND w/ GRAVEL</u>			
	<u>404</u>	<u>408</u>	<u>BRN CLAY</u>			
	<u>408</u>	<u>424</u>	<u>COARSE SAND, PEA GRAVEL</u>			
	<u>424</u>	<u>438</u>	<u>BRN - GRAY - GREEN CLAY</u>			
	<u>438</u>	<u>462</u>	<u>COARSE SAND, PEA GRAVEL</u>			
	<u>462</u>	<u>464</u>	<u>GREEN-GRAY CLAY</u>			
	<u>464</u>	<u>481</u>	<u>COARSE SAND, PEA GRAVEL</u>			
	<u>481</u>	<u>489</u>	<u>GRAY CLAY</u>			
	<u>489</u>	<u>495</u>	<u>COARSE SAND, PEA GRAVEL</u>			
	<u>495</u>	<u>504</u>	<u>GRAY CLAY</u>			

RECEIVED

JAN 10 2014

WATER RESOURCES
WESTERN REGION

RECEIVED

MAY 12 2005

WATER RESOURCES
WESTERN REGION

Completed Depth _____ (Measurable)

Date: Started 4-25-05 Completed 5-10-05

14. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name RIVERSIDE, INC Firm No. 333

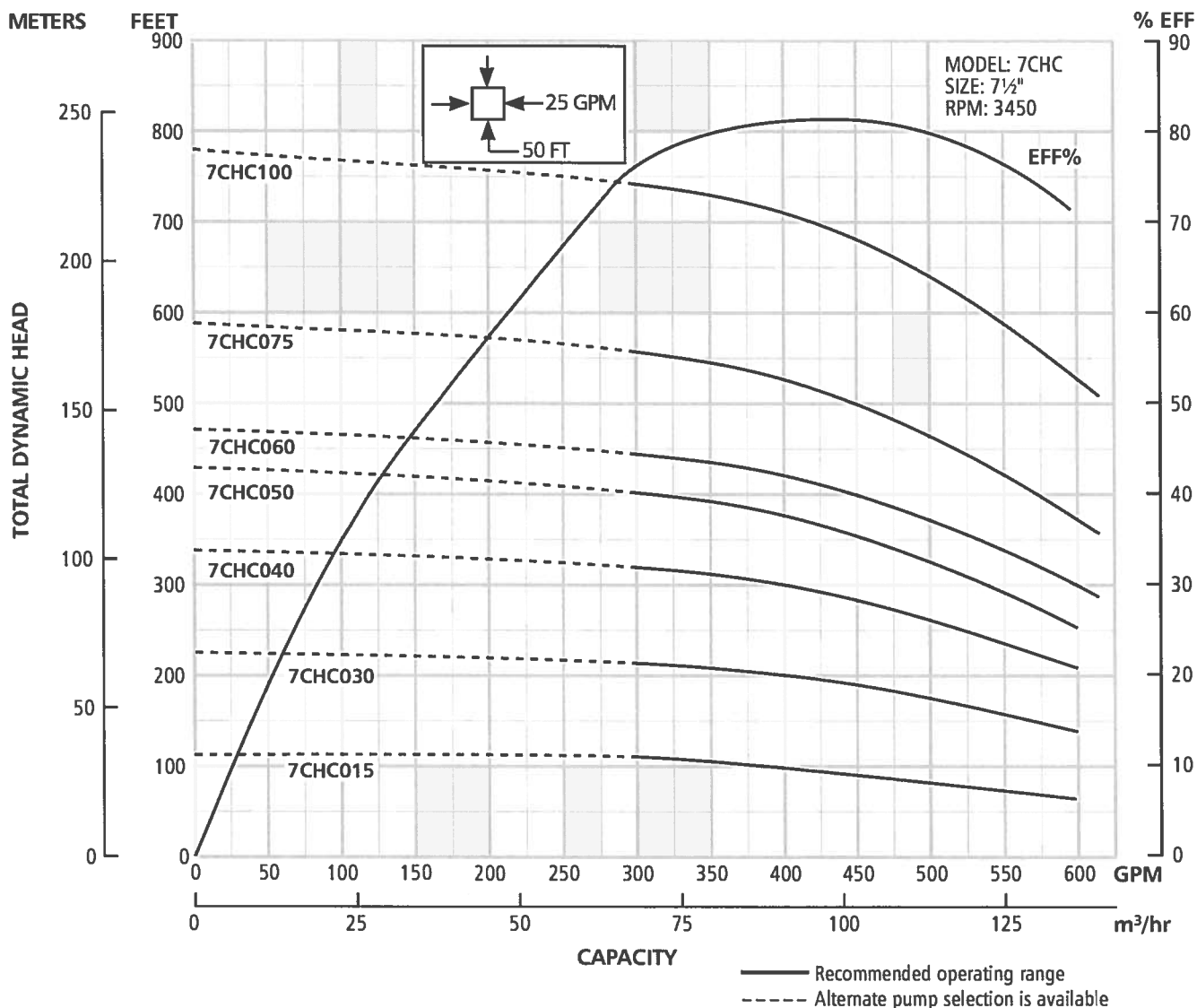
Principal Driller Kevin Clinton Date 5-5-05

and Driller or Operator [Signature] Date _____

Operator [Signature] Date 5-11-05

Principal Driller and Rig Operator Required.
 Operator I must have signature of Driller/Operator II.

Model 7CHC 450 GPM



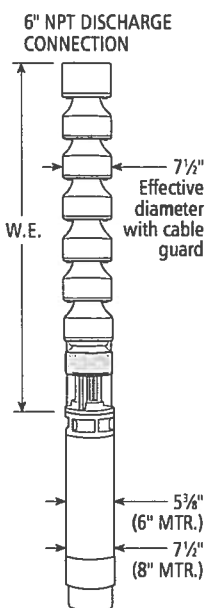
DIMENSIONS AND WEIGHTS

HP	Stages	W.E. Order Number	W.E. Length	W.E. Wt. (lbs.)
15	1	07CHC01566ATS	22.9	75
30	2	07CHC03066ATS	29.3	103
40	3	07CHC04066ATS	35.6	131
50	4	07CHC05066ATS	42.0	159
60	4	07CHC06066ATS		
75	5	07CHC07586ATS	50.0	199
100	6	07CHC10086ATS	56.5	227

(All dimensions in inches and weights in lbs. Do not use for construction purposes.)

PLEASE NOTE:

- Order motors separately.
- For intermediate horsepower pumps consult factory.
- Solid line is recommended operating range. The dotted line (---) signifies an alternate pump selection is available.
- Please specify all options changes in W.E. order number.

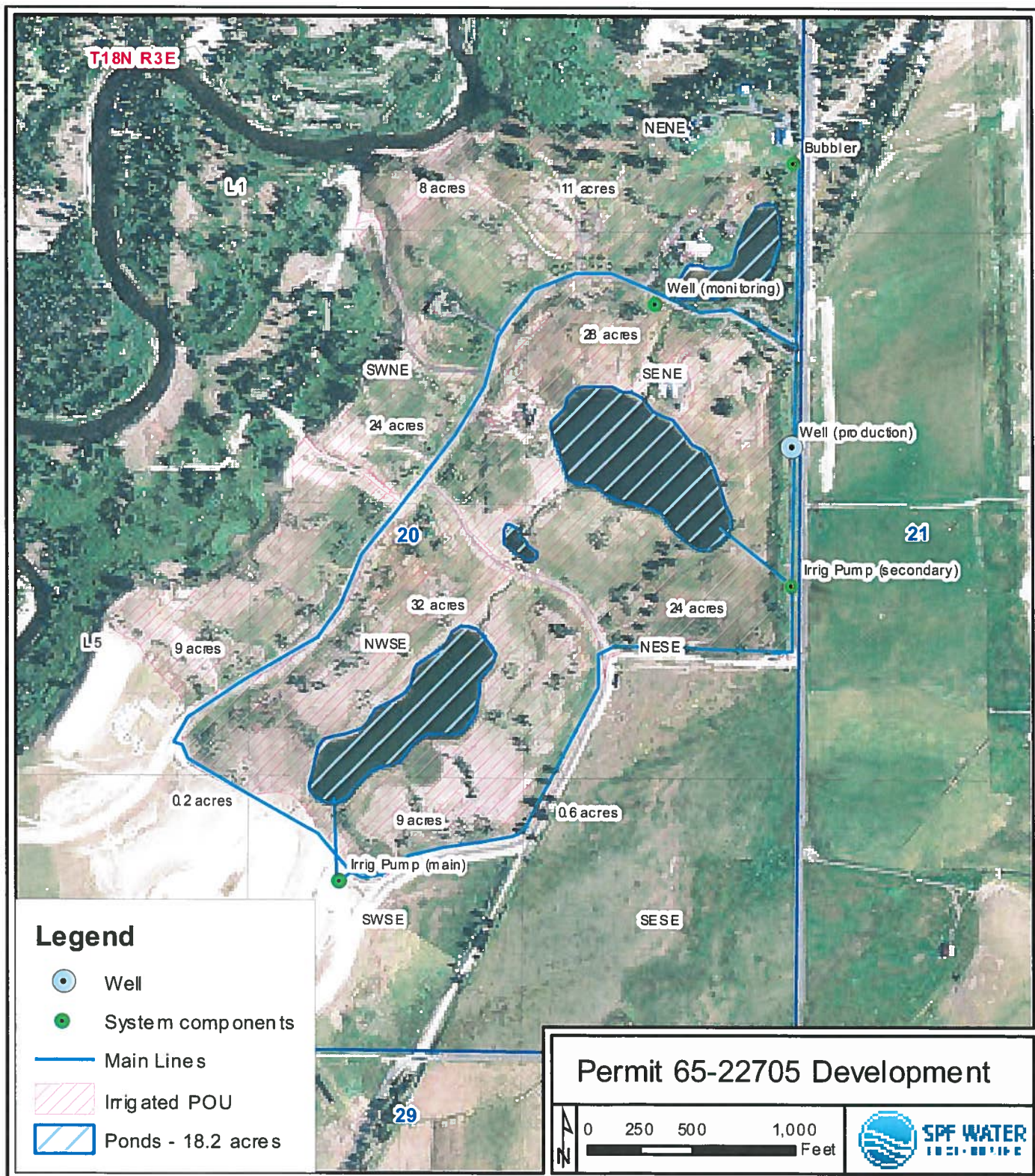


MATERIALS OF CONSTRUCTION

Part Name	Material
Shaft	ASTM A582 TYPE 416
Coupling	ASTM A582 S41600 CD
Suction Adapter	Ductile Iron ASTM A536
Discharge Bowl	ASTM A48 CL 30B
Rubber Bearings	RUBBER
Optional Bronze Bearings	ASTM B584
Discharge Bowl Bearing	ASTM B584
Taperlocks	ASTM A108 GR 101B
Bowl	ASTM A48 CL 30B
Upthrust Collar	Polyethylene
Impeller	ASTM B584
Fasteners	SAE J429 GR 8
Cable Guard	ASTM A240 S 30400
Suction Strainer	ASTM A240 S 30400

ATTACHMENT C
TOPO MAP AND 2011 AERIAL PHOTO





ATTACHMENT D
PHOTOS



Figure 1: McCall River Ranch.



Figure 2: Entrance.



Figure 3: Irrigation well equipped with submersible pump. Well tag D0038988.



Figure 4: Flowmeter installation with well to photo right.



Figure 5: Well pump panel and VFD controller.



Figure 6: Irrigation well house.



Figure 7: Bubbler at northeast corner of project.



Figure 8: Discharge from bubbler into stream conveying flow to ponds and irrigation pumps.



Figure 9: 100-hp secondary irrigation pump draws from pond 2.



Figure 10: Secondary irrigation pump house.



Figure 11: Monitoring well with pond 2 in background.



Figure 12: Monitoring well with pond 1 in background right.



Figure 13: Pond 4.

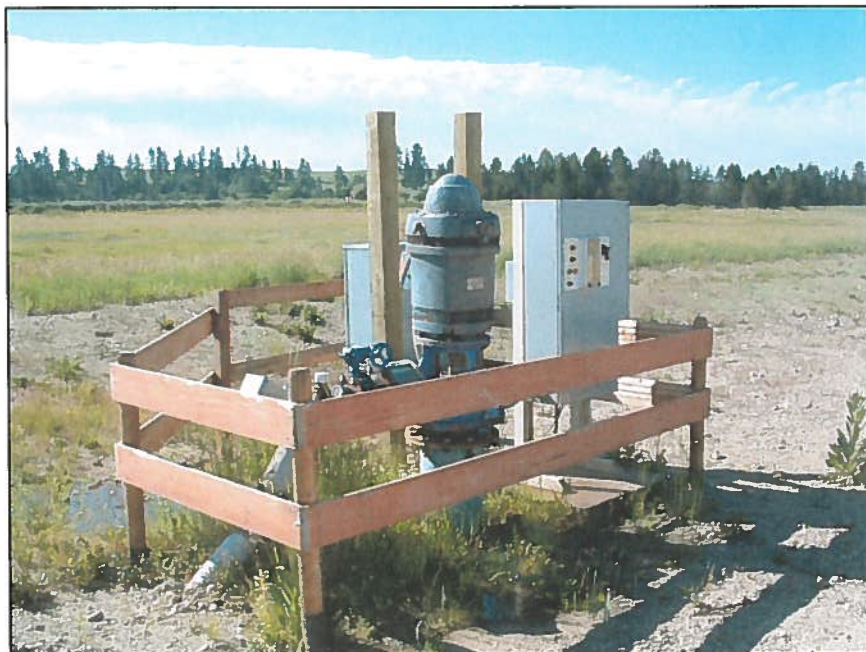


Figure 14: 75-hp primary irrigation booster draws from pond 4.



Figure 15: Pond 3.

ATTACHMENT E
FLOW MEASUREMENT RECORDS

Permit: 65-22705
 Owner: McCall River Ranch Co
 Site Name: Production Well
 POD Location: 6N 6W 25 SENW
 Tag No: D0038988
 Meter: GE TransPort PT878
 Type: Portable Ultrasonic Time Flight Liquid Flow Meter
 Serial Number: 7140
 Calibration Date: March 27, 2013
 Operator: Scott King

Date/Time	Volume (gal/m)	(+)Total (gal)	(-)Total (gal)	Error #
9/10/2013 13:24:04	572	6153	0	0
9/10/2013 13:25:04	570	6715	0	0
9/10/2013 13:26:04	569	7298	0	0
9/10/2013 13:27:05	568	7851	0	0
9/10/2013 13:28:04	566	8431	0	0
9/10/2013 13:29:04	565	8978	0	0
9/10/2013 13:30:04	562	9556	0	0
9/10/2013 13:31:04	563	10129	0	0
9/10/2013 13:32:04	567	10685	0	0
9/10/2013 13:33:05	564	11263	0	0
9/10/2013 13:34:04	565	11817	0	0

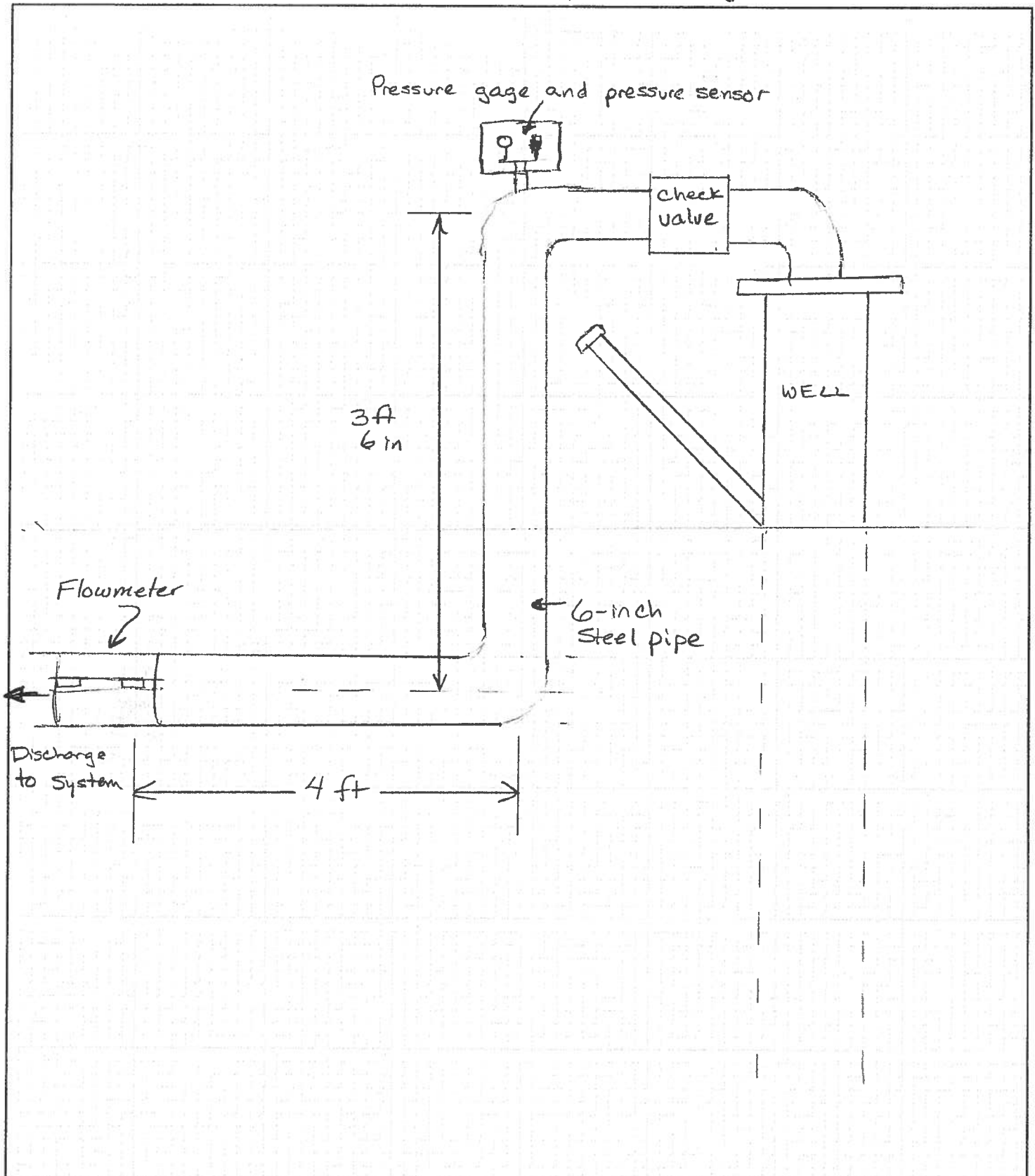
Time	10 minutes
Volume	5663 gallons
Rate	566 gpm
Rate	1.26 cfs

ATTACHMENT F
PUMPING SYSTEM DIAGRAM



SPF WATER
ENGINEERING, LLC

By S. King Date 9/10/2013 Client McCall River Ranch Sheet 1 of 1
Chkd By _____ Description BUFE Well System Diagram Job No 466.0040



ATTACHMENT G
POND CALCULATIONS

65-22705 Pond Capacity Calculations

Pond	Area (ft ²)	Area (acres)	Depth (ft)	Volume Multiplier	Volume (acre-feet)
1	110,296	2.5	20	0.4	20.3
2	379,578	8.7	20	0.4	69.7
3	13,782	0.3	10	0.4	1.3
4	288,739	6.6	20	0.4	53.0
Totals	792,395	18.2			91.2

Depths based on Kevin Hart's description.

Attachment B
Aquifer Pumping Test Data

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

1. WELL TAG NO. D 0038988
 DRILLING PERMIT NO. 887753-832124
 Water Right or Injection Well No. 65-22705

2. OWNER:

Name McCALL RIVER RANCH COMPANY
 Address P.O. Box 886
 City McCALL State ID Zip 83638

3. LOCATION OF WELL by legal description:

You must provide address or Lot, Blk, Sub. or Directions to well.

Twp. 18 North ☒ or South ☐
 Rge. 3 East ☒ or West ☐
 Sec. 20 1/4 SE 1/4 NE 1/4
 Gov't Lot _____
 County Valley

Lat: _____ Long: _____
 Address of Well Site WEST SIDE OF MISSION STREET

City McCALL
 (Give at least name of road + Distance to Road or Landmark)
 Lt. _____ Blk. _____ Sub. Name McCall River Ranch

4. USE:

☐ Domestic ☐ Municipal ☐ Monitor ☒ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)

☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD:

☐ Air Rotary ☐ Cable ☐ Mud Rotary ☒ Other REVERSE

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
<u>5% BENTONITE</u>	<u>0</u>	<u>365</u>	<u>30,000</u>	<u>DRY POUR</u>

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s) _____

Was drive shoe seal tested? ☐ Y ☒ N How? _____

8. CASING/LINER: REDUCER 12" to 8" @ 238'

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>12"</u>	<u>238</u>	<u>250</u>	<u>250</u>	<u>STEEL</u>	☒	☐	☒	☐
<u>8"</u>	<u>238</u>	<u>382</u>	<u>250</u>	<u>STEEL</u>	☒	☐	☒	☐
<u>6"</u>	<u>422</u>	<u>440</u>	<u>250</u>	<u>STEEL</u>	☒	☐	☒	☐

Length of Headpipe _____ Length of Tailpipe 2'

Packer ☐ Y ☒ N Type _____

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method _____

Screen Type & Method of Installation JOHNSON WIREWRAP

From	To	S'ot Size	Number	Diameter	Material	Casing	Liner
<u>382</u>	<u>422</u>	<u>.030</u>		<u>8"</u>	<u>S.S.</u>	☒	☐
<u>440</u>	<u>480</u>	<u>.030</u>		<u>6"</u>	<u>S.S.</u>	☒	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method
<u>6-9 BSST SAND</u>	<u>365</u>	<u>504</u>	<u>12,000</u>	<u>DRY POUR</u>

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

50.2 ft. below ground Artesian pressure _____ lb.

Depth flow encountered _____ ft. Describe access port or control devices: _____

1 1/2" pipe ON SIDE

832124
 Office Use Only
 Well ID No. 402717
 Inspected by _____
 Twp _____ Rge _____ Sec _____
 1/4 _____ 1/4 _____ 1/4 _____
 Lat: _____ : _____ : _____ Long: _____ : _____ : _____

12. WELL TESTS:

☒ Pump ☐ Bailor ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
<u>400 gpm</u>	<u>118</u>	<u>168' 9"</u>	<u>2 hr</u>

Water Temp. _____ Bottom hole temp. _____

Water Quality test or comments: _____

Depth first Water Encounter _____

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water	Y	N
<u>20"</u>	<u>0</u>	<u>4</u>	<u>TOP SOIL</u>			
<u>18"</u>	<u>4</u>	<u>112</u>	<u>FINE-COARSE SAND, PEA GRAVEL</u>			
<u>18"</u>	<u>112</u>	<u>114</u>	<u>BRN + GREEN CLAY</u>			
<u>18"</u>	<u>114</u>	<u>172</u>	<u>GREEN/GRAY SAND</u>			
<u>14"</u>	<u>172</u>	<u>342</u>	<u>STICKY GRAY CLAY</u>			
	<u>342</u>	<u>345</u>	<u>SANDY GRAY CLAY</u>			
	<u>345</u>	<u>362</u>	<u>COARSE SAND, GRAVEL</u>			
	<u>362</u>	<u>380</u>	<u>GRAY SANDY CLAY</u>			
	<u>380</u>	<u>404</u>	<u>COARSE SAND w/ GRAVEL</u>			
	<u>404</u>	<u>408</u>	<u>BRN CLAY</u>			
	<u>408</u>	<u>424</u>	<u>COARSE SAND, PEA GRAVEL</u>			
	<u>424</u>	<u>438</u>	<u>BRN - GRAY - GREEN CLAY</u>			
	<u>438</u>	<u>462</u>	<u>COARSE SAND, PEA GRAVEL</u>			
	<u>462</u>	<u>464</u>	<u>GREEN-GRAY CLAY</u>			
	<u>464</u>	<u>481</u>	<u>COARSE SAND, PEA GRAVEL</u>			
	<u>481</u>	<u>489</u>	<u>GRAY CLAY</u>			
	<u>489</u>	<u>495</u>	<u>COARSE SAND, PEA GRAVEL</u>			
	<u>495</u>	<u>504</u>	<u>GRAY CLAY</u>			

RECEIVED

MAY 12 2005

WATER RESOURCES
WESTERN REGION

Completed Depth _____ (Measurable)

Date: Started 4-25-05 Completed 5-10-05

14. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name RIVERSIDE, INC Firm No. 333

Principal Driller Kevin Clinton Date 5-9-05

and _____ Date _____

Driller or Operator [Signature] Date _____

Operator [Signature] Date 5-11-05

Principal Driller and Rig Operator Required.
 Operator I must have signature of Driller/Operator II.

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

832385

Office Use Only
Well ID No. 402976
Inspected by _____
Twp _____ Rge _____ Sec _____
1/4 _____ 1/4 _____ 1/4 _____
Lat: : : Long: : :

1. WELL TAG NO. D 0039013
DRILLING PERMIT NO. 887885-832385
Water Right or Injection Well No. _____

2. OWNER:

Name McCALL RIVER RANCH COMPANY
Address P.O. Box 886
City McCALL State ID Zip 83638

3. LOCATION OF WELL by legal description:

You must provide address or Lot, Blk, Sub. or Directions to well.

Twp. 18 North ☒ or South ☐
Rge. 3 East ☒ or West ☐
Sec. 20 1/4 SE 1/4 NE 1/4
Gov't Lot _____
County VALLEY 10 acres 160 acres
Lat: : : Long: : :
Address of Well Site ROAD No. 1

City McCALL
(Give at least name of road or distance to road or landmark)
Lt. 26 Blk. _____ Sub. Name McCall River Ranch

4. USE:

☐ Domestic ☐ Municipal ☒ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply

(Replacement etc.)

☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD:

☐ Air Rotary ☐ Cable ☐ Mud Rotary ☒ Other REVERSE

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
<u>7/8 BENTONITE</u>	<u>200</u>	<u>400</u>	<u>12,000</u>	<u>DRY POUR</u>
<u>5/8 BENTONITE</u>	<u>110</u>	<u>140</u>	<u>2,000</u>	<u>DRY POUR</u>
<u>3/8 BENTONITE</u>	<u>80</u>	<u>100</u>	<u>3,000</u>	<u>DRY POUR</u>

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s) _____
Was drive shoe seal tested? ☐ Y ☒ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>#1 2"</u>	<u>+1</u>	<u>450</u>	<u>3/8</u>	<u>P.V.C.</u>	☒	☐	☐	☒
<u>#2 2"</u>	<u>+1</u>	<u>150</u>	<u>3/8</u>	<u>P.V.C.</u>	☒	☐	☐	☒
<u>#3 4"</u>	<u>+1</u>	<u>80</u>	<u>3/4</u>	<u>P.V.C.</u>	☒	☐	☐	☒

Length of Headpipe _____ Length of Tailpipe _____
Packer ☐ Y ☒ N Type _____

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method _____

Screen Type & Method of Installation JOHNSON WIRE WRAP P.V.C. SCREENS

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
<u>#1 450</u>	<u>470</u>	<u>.020</u>		<u>2"</u>	<u>PVC</u>	☒	☐
<u>#2 150</u>	<u>170</u>	<u>.020</u>		<u>2"</u>	<u>PVC</u>	☒	☐
<u>#3 80</u>	<u>100</u>	<u>.020</u>		<u>4"</u>	<u>PVC</u>	☒	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method
<u>3/8 GRAVEL</u>	<u>400</u>	<u>575</u>	<u>12,000</u>	<u>DRY POUR</u>
<u>3/8 GRAVEL</u>	<u>140</u>	<u>200</u>	<u>6,000</u>	<u>DRY POUR</u>
<u>3/8 GRAVEL</u>	<u>70</u>	<u>110</u>	<u>3,000</u>	<u>DRY POUR</u>

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

_____ ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

12. WELL TESTS:

☐ Pump ☐ Bailor ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
<u>N/A</u>			

Water Temp. _____ Bottom hole temp. _____

Water Quality test or comments: _____

Depth first Water Encounter _____

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Water

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
<u>13 1/2"</u>	<u>0</u>	<u>2</u>	<u>TOP SOIL</u>		
	<u>2</u>	<u>175</u>	<u>SAND - SM. GRAVEL</u>		
	<u>175</u>	<u>385</u>	<u>STICKY GRAY CLAY</u>		
	<u>385</u>	<u>418</u>	<u>FINE - COARSE SAND, SA GRAVEL</u>		
	<u>418</u>	<u>421</u>	<u>GRAY CLAY</u>		
	<u>421</u>	<u>431</u>	<u>COARSE SAND - FEA GRAVEL</u>		
	<u>431</u>	<u>433</u>	<u>GRAY CLAY</u>		
	<u>433</u>	<u>449</u>	<u>MED - COARSE SAND, FEA GRAVEL</u>		
	<u>449</u>	<u>453</u>	<u>DK BRN - GRAY - GREEN CLAY</u>		
	<u>453</u>	<u>486</u>	<u>MED - COARSE SAND, FEA GRAVEL</u>		
	<u>486</u>	<u>488</u>	<u>GRAY CLAY</u>		
	<u>488</u>	<u>494</u>	<u>FINE - COARSE SAND</u>		
	<u>494</u>	<u>575</u>	<u>GRAY CLAY</u>		

RECEIVED

MAY 12 2005

WATER RESOURCES
WESTERN REGION

Completed Depth _____ (Measurable)

Date: Started 4-15-05 Completed 4-29-05

14. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name RIVERSIDE INC Firm No. 333

Principal Driller Henry Chady Date 5-5-05

and Driller or Operator II [Signature] Date 5-11-05

Operator I [Signature] Date _____

Principal Driller and Rig Operator Required.
Operator I must have signature of Driller/Operator II.

FORWARD WHITE COPY TO WATER RESOURCES

McCall River Ranch Pump Test
8/19/2013 to 9/14/2013
Manual Observations
Pump on at:

9/14/13 13:00 based on levellogger data

Date	Time	DateTime	Duration (min)	4" Shallow Well DTW (ft)	4" Shallow Well DD (ft)	2" Mid/Tail Well DTW (ft)	2" Mid/Tail Well DD (ft)	2" Deep/Short Well DTW (ft)	2" Deep/Short Well DD (ft)	Q (gpm)	Distance w.r.t. pump (ft)	Notes
8/19/2013	12:00	8/19/13 12:00		52.92		55.55		63.92		0	940	SWL
9/10/2013	12:45	9/10/13 12:45		52.75	0.00	53.37	0.00	53.30	0.00	0	940	SWL
9/10/2013	13:11	9/10/13 13:11	5851							500		Pump on
9/10/2013	13:52	9/10/13 13:52		52.70	-0.05	53.30	-0.07	56.30	3.00	500	940	
9/10/2013	14:50	9/10/13 14:50		52.68	-0.07	53.24	-0.13	61.38	8.08	500	940	
9/10/2013	15:30	9/10/13 15:30		52.69	-0.06	53.23	-0.14	64.20	10.90	500	940	
9/14/2013	14:16	9/14/13 14:16						128.06	74.76	500	940	
9/14/2013	14:18	9/14/13 14:18				53.20	-0.17			500	940	
9/14/2013	14:20	9/14/13 14:20		52.60	-0.15					500	940	
9/14/2013	14:40	9/14/13 14:40								500	940	Could not find water level in pumping well, suspect that sounder is hanging up @12x8 reduction (238 feet); vfd @100%;
9/14/2013	14:42	9/14/13 14:42								500	940	Pump off
9/14/2013	14:55	9/14/13 14:55				53.20	-0.17				940	
9/14/2013	14:57	9/14/13 14:57		52.62	-0.13						940	
9/14/2013	14:58	9/14/13 14:58						127.20	73.90		940	
9/14/2013	15:00	9/14/13 15:00						127.02	73.72		940	
9/14/2013	15:03	9/14/13 15:03						126.71	73.41		940	
9/14/2013	15:06	9/14/13 15:06						126.38	73.08		940	

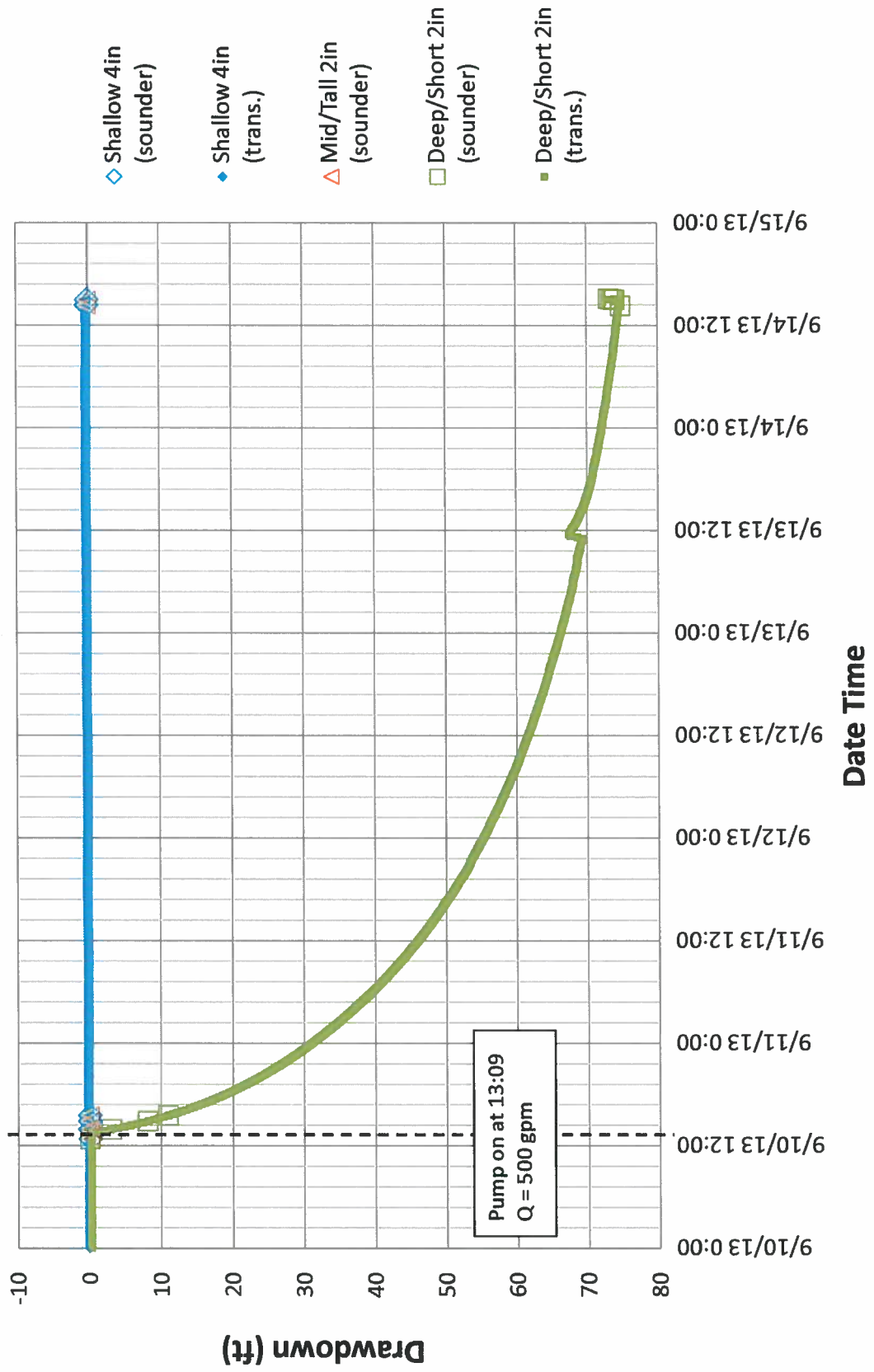
McCall River Ranch Pumping Test 8/19/2013 to 9/14/2013



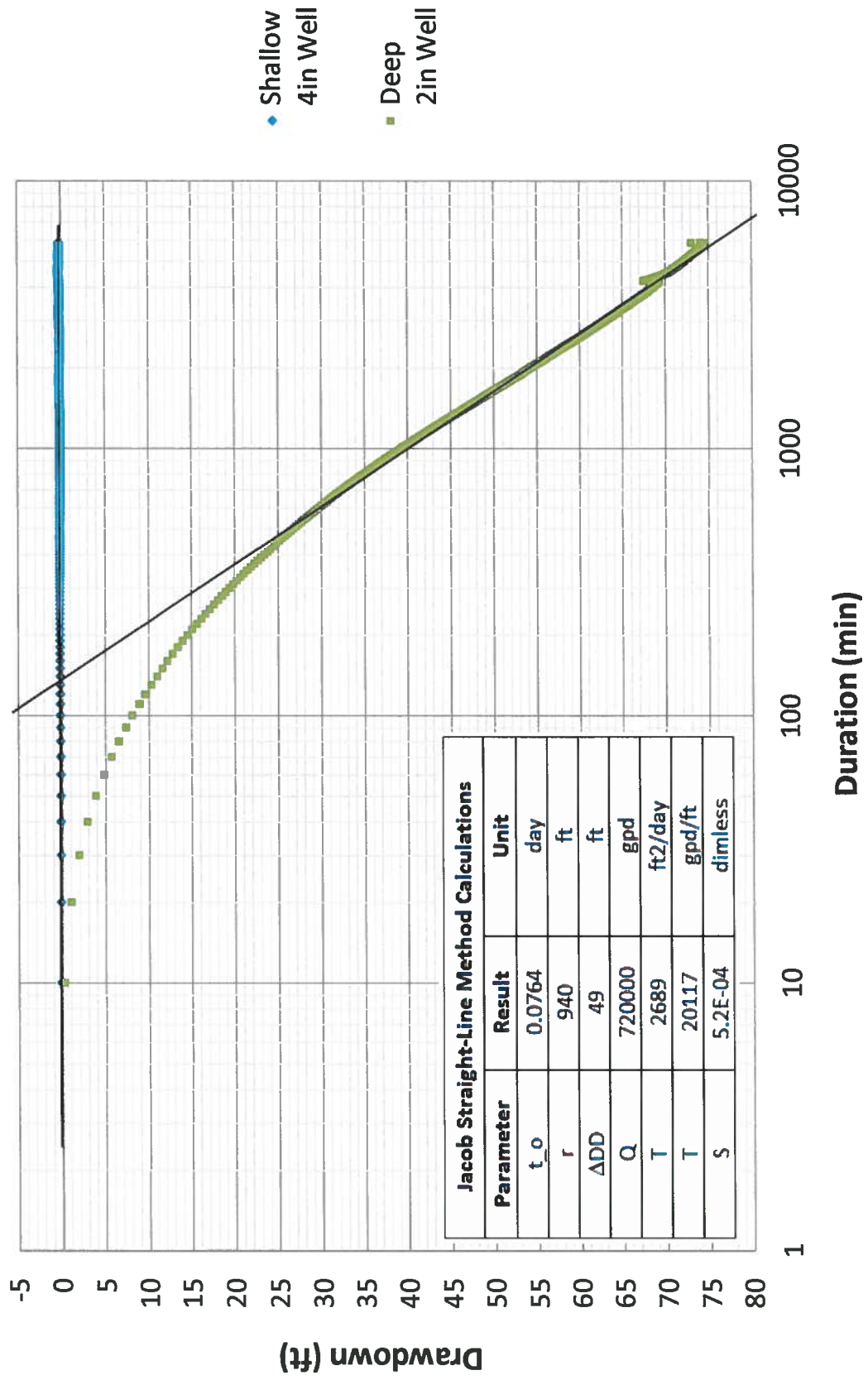
McCall River Ranch Pumping Test

Arithmetic Plot

9/10/2013 to 9/14/2013



McCall River Ranch Pumping Test Semi-Log Drawdown Plot with Jacob Method Calculations



MEMORANDUM

TO: File 65-22705

FROM: Daniel Nelson – Staff Hydrologist

DATE: February 3, 2014

SUBJECT: Licensing Review for 65-22705.

This is licensing review of the field exam that was supplied by the Certified Field Examiner (CFE), Scott King of SPF Water Engineering. There are several issues that need to be addressed in the licensing of this permit. I will address each issues separately below:

Removal of Aesthetic and Recreation Uses:

The CFE did not recommend the aesthetic and recreation uses in the field report. I contacted the CFE and asked if these uses were developed or not. The CFE informed me that none of the water diverted from the well was released beyond the last pond on the system. These uses were originally for a flow through system that was never developed. The water in the system is re-circulated, to reduce the amount water diverted from the ground water. I asked about the possible losses of water in the channels connecting the ponds, but the CFE informed me that the amount of losses in the channels between the ponds was minimal. We agreed to include a condition that states that storage includes losses incurred by water delivered through the channels connecting the ponds.

Diversion Rate:

The permit allows a rate of diversion of 6.00 cfs for irrigation and for diversion to storage. The field examiner measured the well associated with this water right permit using a standard flow meter. The flow meter showed a rate of diversion of 566 gpm or 1.26 cfs. This permit should be licensed for 1.26 cfs for the irrigation use and the diversion to storage use, since this is the capacity of the well.

Diversion Volume:

Permits do not list a volume amount for irrigation until the permit has been licensed. The CFE properly defined the irrigation diversion rate as 437 acre feet of water for irrigation purposes. This amount should be carried over to the license.

The storage volume for the permit was calculated 190 acre feet for the initial fill and up to 62.5 acre-feet for evaporation for a total of 250 acre feet for storage. No seepage was requested, since the ponds would be lined. Please see Terry Scanlan's letter dated February 9, 2003 for the definition of the storage component.

The CFE found that the actual pond storage was 91.2 acre-feet of storage. The CFE did not address the evaporation or the seepage in the field exam report. I spoke with the CFE on January 21, 2014 concerning this issue, and he told me he did neglect the evaporation of the pond. Please see the conversation memo dated January 21, 2014. The CFE agreed to allow me to use the Department's seepage spreadsheet to determine the evaporation losses. The volume for storage is as shown below:

Pond #1	=	20.3 Capacity	-	2.8 Evaporation	=	23.1 Total
Pond #2	=	69.7 Capacity	-	9.7 Evaporation	=	79.4 Total
Pond #3	=	1.3 Capacity	-	0.4 Evaporation	=	1.7 Total
<u>Pond #4</u>	<u>=</u>	<u>53.0 Capacity</u>	<u>-</u>	<u>7.4 Evaporation</u>	<u>=</u>	<u>60.4 Total</u>
TOTAL	=	144.3 Capacity	-	20.3 Evaporation	=	164.6 Total

The irrigation shape file submitted by the CFE showed a total of 146.2 acres instead of the 145.8 acres listed on the field exam report. This discrepancy is due to rounding errors and Department standards for significant figures. Therefore, I corrected the acre amounts based on the shape file submitted. The 146.2 acres would have an annual volume limitation of 439 acres ($146.2 \times 3 = 438.6$).

The permit would have a volume of 439 acre feet for irrigation, 144.3 acre feet for irrigation storage, and 165 acre feet for aesthetic and recreation storage for a total of 604 acre feet of water. The pump can produce 912 acre feet of water in a year at a diversion rate of 1.26, so a total volume of 602 acre feet should be listed on the license ($1.26 \text{ cfs} \times 1.9836 \times 365 \text{ days} = 912.2 \text{ af}$).

Conditions:

Conditions 1-4 will be removed at licensing as is the standard for these conditions. Condition # 5 of the permit limits the drilling of the well within $\frac{1}{4}$ miles of the nearest domestic well. According to Department records, there are no wells within a 1.4 mile radius of the well. Therefore, this condition has been removed.

The CFE asked that due to the results of the aquifer pumping test that the permit conditions 6, 7, 8, and 12 be removed at licensing. These conditions have a clause in them that allows them to be removed if the aquifer pumping test showed no interference to shallow ground water, the Payette River, or its tributaries. My initial review of the test performed confirms the CFE's conclusion that conditions 6, 7, 8, and 12 should be removed. I reviewed the information with staff, and we have agreed that removing conditions 6, 7, 8, and 12 is reasonable.

The remaining conditions will be updated as per current standard language. Condition 14 will be changed to condition 103. An additional condition will be added to confirm that the water delivered through the conveyance ditches between ponds is covered by the storage components under this water right. Recirculation

I believe we can move forward with licensing of the permit. The rate and volume will be corrected as instructed above.

Nelson, Dan

From: Nelson, Dan
Sent: Wednesday, February 05, 2014 9:59 AM
To: 'Scott King'
Subject: RE: Field Exam for 65-22705

Thanks Scott. That did it. I figured out where we were different. Shelley has Thursday and Friday off, but I will have the recommended license on his desk Monday morning.

Dan

From: Scott King [<mailto:SKing@spfwater.com>]
Sent: Tuesday, February 04, 2014 6:51 PM
To: Nelson, Dan
Subject: RE: Field Exam for 65-22705

Dan,
Attached are shapes for the ponds and the irrigated area.
Thank you,
Scott

From: Nelson, Dan [<mailto:Dan.Nelson@idwr.idaho.gov>]
Sent: Tuesday, February 04, 2014 3:14 PM
To: Scott King
Subject: Field Exam for 65-22705

Hi Scott,

I have worked through everything, and I think I am just about ready to submit my recommendation for licensing to Shelley. I am trying to get the shape files to line up with the pond calculations that you did. I am really having problems with Pond #4 getting the shape file acres to match your calculated acres. Could you send me a copy of the shape files you used? We need the shape files to match your pond calculations.

Thanks Scott.

Daniel Nelson
Staff Hydrologist
Idaho Department of Water Resources
Telephone (208) 287-4856
Fax (208) 287-6700 (attn: Dan Nelson)

Nelson, Dan

From: Nelson, Dan
Sent: Tuesday, February 04, 2014 3:14 PM
To: 'Scott King'
Subject: Field Exam for 65-22705

Hi Scott,

I have worked through everything, and I think I am just about ready to submit my recommendation for licensing to Shelley. I am trying to get the shape files to line up with the pond calculations that you did. I am really having problems with Pond #4 getting the shape file acres to match your calculated acres. Could you send me a copy of the shape files you used? We need the shape files to match your pond calculations.

Thanks Scott.

Daniel Nelson
Staff Hydrologist
Idaho Department of Water Resources
Telephone (208) 287-4856
Fax (208) 287-6700 (attn: Dan Nelson)

Nelson, Dan

From: Nelson, Dan
Sent: Tuesday, January 28, 2014 10:06 AM
To: sking@spfwater.com
Subject: Another Question on the McCall River Ranch Field Exam

Hi Scott,

According to the field exam in section 4, you say the pump is a 60 Hp pump with a pump make of Goulds 7 CHC 5. The pump curve states the pump make for a 60 Hp pump is 07CHC06066ATS, and the curve is for a Model 7CHC 450 gpm pump. Did we get the correct pump curve?

I feel the measurement is more accurate than the pump curve anyway, so I am good with the pump measurement of 566 gpm. I will need to explain why there is a difference in the pump curve when compared to the information entered into the field exam report. It just adds a layer of confusion.

I will give you an answer as soon as possible on the request to remove the conditions during the licensing process. Administration may want a technical review be done by our technical staff, so I will keep you notified on what steps we are taking to ensure that you and your client is aware of what our final product will be.

Thanks Scott.

Daniel Nelson
Staff Hydrologist
Idaho Department of Water Resources
Telephone (208) 287-4856
Fax (208) 287-6700 (attn: Dan Nelson)

Received voice message at 11:00 AM, 1-28-14.
From Scott King. He did NOT receive the
pump curve in the file from the client
OR the well driller. The pump ~~at~~ curve
was pulled from a book Mr. King had on
hand. The pump numbers in the field
exam were ~~at~~ taken directly from the
pump. Therefore, I am disregarding
the pump curve and going with the
measurement ONLY.

MEMORANDUM

TO: File 65-22705

FROM: Daniel Nelson – Staff Hydrologist

DATE: January 21, 2014

SUBJECT: Conversation Memo With Scott King SPF Water Engineering

Today I spoke with Scott King of SPF Water Engineering concerning the field exam report he submitted for permit 65-22705. In Mr. King's report, I discovered that Mr. King had excluded the aesthetic and recreation components that were on the report, and that he did not address the evaporation losses in the pond.

Mr. King stated that no water from the well leaves the property, and that the only portion of the system that could be considered aesthetic or recreation was the channels delivering water between the ponds. Mr. King stated that the amount of water lost to seepage or evaporation would be minimal at best, and that amount allowed under storage the storage component would be adequate to cover any losses in the channels between the ponds.

I discussed this with staff, and it was decided that we would add a condition that states storage includes losses incurred by water delivered through the channels connection the ponds.

Mr. King also agreed to use our pond seepage spreadsheet to determine the evaporation volumes allowed for the ponds. The seepage spreadsheets for each pond are attached to this memo. Please note that there is no seepage listed in the spreadsheet, since Mr. King stated that these ponds had been lined. A letter written by Terry Scanlan on February 9, 2003 during the permitting process states that the ponds would be lined.

TOTAL STORAGE

FILE NUMBER	65-22705 Pond 1
REVIEWER	Dan Nelson
DATE	1/21/2014

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

Surface Area (in Acres)	2.53204775	"Surface Area" is automatically carried over from the "Seepage Loss Sheet"
Average Pond Depth (in feet)	8	"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
Pond Capacity (in acre feet)	20.256382	you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above.

Volume Needed Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (in acre feet)	0	The "Volume Needed Above Initial Fill" is the acre-feet of water required to meet <i>afrom 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). PLEASE 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 (in acre feet)	0.0	The "Estimated Seepage Loss" is automatically carried over from the Seepage Loss Sheet
Estimated Evaporation Loss (in acre feet)	2.8	The "Estimated Evaporation Loss" is automatically carried over from the Evaporation Loss Sheet
Total Volume Required (in acre feet)	23.1	"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.

Flow Rate Into Pond (in cfs)	1.00	The "Flow Rate" Into the Pond depicts the actual flow either measured or estimated into the pond.
Highest Daily Evaporation Rate From Evaporation Tab. (in mm/day)	3.44	This number is automatically selected by picking the highest recorded number in the "Precipitation Deficit Table".
Maximum Required Daily Maintenance Volume (in acre feet per day)	0.03	"Maximum Required Daily Maintenance Volume" is the maximum volume of water needed on any given day during the year, and is calculated by adding the highest daily evaporation loss to the average daily seepage loss in acre feet. The average daily seepage loss is calculated by dividing the "Estimated Seepage Loss" by 365 days. This is acceptable, since the seepage rate shouldn't vary throughout the season unless the pond completely freezes over during the winter months. The highest daily evaporation loss is calculated by dividing the Highest Daily Evaporation Rate by the 304.8 conversion factor and multiplying this number by the pond surface area to attain a combined daily acre feet requirement.
Minimum Maintenance Flow (in cfs)	0.01	The "Minimum Maintenance Flow" is the minimum amount of flow required to maintain the level of the pond. This number is determine by dividing the "Maximum Required Daily Maintenance Volume" by 1.9835. This flow can be used to determine if the flow rate into the pond is adequate to maintain the pond level.
Days Required to Fill the Pond	10	The "Days Required to Fill the Pond" is calculated by dividing the "Pond Capacity" by the "Flow Rate" minus "Minimum Maintenance Flow" multiplied by 1.9835. This section will assist you in determining if the flow rate being diverted to the pond is adequate to fill the pond while maintaining the pond level. The length of time to fill the pond will help determine if the flow rate is adequate for the size of pond being proposed. This number should be between 1 and 365 days for a project to be successful.
Days Required to Fill the Pond at 13,000 gallons per day	1790	The "Days Required to Fill the Pond at 13,000 gallons per day" is calculated converting the "Pond Capacity" and the "Maximum Daily Maintenance Volume" to gallons. The "Pond Capacity is then divided by 13,000 gallons minus the "Maximum Daily Maintenance Volume" in gallons to determine the number of days to fill pond. This number should be between 1 and 365 if this pond is to described as a domestic use.

User Input
Calculated value
Formula Explanations

Evaporation Loss Calculation

FILE NUMBER	65-22705 Pond 1
REVIEWER	Dan Nelson
DATE	1/21/2014

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

The acronyms used on the Kimberly Research Center website are defined below:
P = Precipitation
ET= Evapotranspiration
P _d = Precipitation deficit
P _d =ET-P

User Input
Calculated value
Formula Explanations

USING THIS SPREADSHEET

To ascertain the evaporation from a pond, you will need to go to the Kimberly Research Center website. The link is found below. This web site provides the Precipitation Deficit for the area where the pond is located. The Precipitation Deficit is the total amount of free pan 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, and the entire state is pretty much covered. 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.

Found at: <http://www.kimberly.uidaho.edu/ETIdaho/online.php>

Precipitation Deficit

Station: Twin Falls 2 NNE (NWS -- 109294)

Month	mm/day ¹	Days per month	mm/Month
Jan	0.00	31	0.00
Feb	0.00	28	0.00
March	0.00	31	0.00
April	0.39	30	11.70
May	0.88	31	27.28
June	1.82	30	54.60
July	3.44	31	106.64
August	2.88	31	89.28
September	1.49	30	44.70
October	0.20	31	6.20
November	0.00	30	0.00
December	0.00	31	0.00

PLEASE NOTE: We cannot use the season average, because there are several areas in Northern Idaho with a negative Precipitation Deficit. Therefore, we must enter each monthly deficit, and enter in a zero (0) for each negative month. The reason for this is that precipitation can only offset evaporation to the extent of the evaporation.

Please enter the daily average Precipitation Deficit as shown in the example below.

Although it has sometimes been useful to consider wintertime evaporation to be zero, Allen and Robison (2007, p. 169) noted, "Evaporation during nongrowing (wintertime) periods varies widely . . ."

¹Negative monthly mean values should be entered in the above table as "0".

Total mm/year = 340.40

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

(340.40) ÷ (304.8) X 2.53 = 2.8 AFA

Surface Area of Pond is automatically Carried over from the Seepage Loss Sheet.

SEEPAGE CALCULATIONS

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

FILE NUMBER	65-22705 Pond 1
REVIEWER	Dan Nelson
DATE	1/21/2014

User Input
Calculated value
Formula Explanations

INPUTS

SQ. FT. Calculator Pond Surface area in acres
2.5320

POND SURFACE AREA (SQ. FT.)	110296
-----------------------------	--------

SUGGESTED SEEPAGE RATE (FT/DAY)	0.0000
---------------------------------	--------

Use the table below to find the "SUGGESTED SEEPAGE RATES".

FORMULA: (Surface Area X Seepage Rate) / 7.48 = Gallons Per Day loss

CONVERT TO GPD	0	GPD
----------------	---	-----

TOTAL SEEPAGE LOSS (AFA)	0.0	AFA
--------------------------	-----	-----

SUGGESTED SEEPAGE RATES FOR DIFFERENT SOIL TYPES:
GW, GP, GM, GC, SW, SP and SM (silty sand, sand silt mixtures and gravel mixtures) = 0.20 ft per day
OL and ML (inorganic silts - very fine sands, silty, or clayey fine sands) = 0.016 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 with shallow 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 <X:\Spatial\Soils\USCS\PondSoils.lyr>. Use "0" if the ponds intersect the water table.

TOTAL STORAGE

FILE NUMBER	65-22705 Pond 2
REVIEWER	Dan Nelson
DATE	1/21/2014

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

Surface Area (in Acres)	8.71391185	"Surface Area" is automatically carried over from the "Seepage Loss Sheet"
Average Pond Depth (in feet)	8	"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 you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above.
Pond Capacity (in acre feet)	69.7112948	

Volume Needed Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (in acre feet)	0	The "Volume Needed Above Initial Fill" is the acre-feet of water required to meet <i>afrom 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). PLEASE 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 (in acre feet)	0.0	The "Estimated Seepage Loss" is automatically carried over from the Seepage Loss Sheet
Estimated Evaporation Loss (in acre feet)	9.7	The "Estimated Evaporation Loss" is automatically carried over from the Evaporation Loss Sheet
Total Volume Required (in acre feet)	79.4	"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.

Flow Rate Into Pond (in cfs)	1.00	The "Flow Rate" Into the Pond depicts the actual flow either measured or estimated into the pond.
Highest Daily Evaporation Rate From Evaporation Tab. (in mm/day)	3.44	This number is automatically selected by picking the highest recorded number in the "Precipitation Deficit Table".
Maximum Required Daily Maintenance Volume (in acre feet per day)	0.10	"Maximum Required Daily Maintenance Volume" is the maximum volume of water needed on any given day during the year, and is calculated by adding the highest daily evaporation loss to the average daily seepage loss in acre feet. The average daily seepage loss is calculated by dividing the "Estimated Seepage Loss" by 365 days. This is acceptable, since the seepage rate shouldn't vary throughout the season unless the pond completely freezes over during the winter months. The highest daily evaporation loss is calculated by dividing the Highest Daily Evaporation Rate by the 304.8 conversion factor and multiplying this number by the pond surface area to attain a combined daily acre feet requirement.
Minimum Maintenance Flow (in cfs)	0.05	The "Minimum Maintenance Flow" is the minimum amount of flow required to maintain the level of the pond. This number is determine by dividing the "Maximum Required Daily Maintenance Volume" by 1.9835. This flow can be used to determine if the flow rate into the pond is adequate to maintain the pond level.
Days Required to Fill the Pond	37	The "Days Required to Fill the Pond" is calculated by dividing the "Pond Capacity" by the "Flow Rate" minus "Minimum Maintenance Flow" multiplied by 1.9835. This section will assist you in determining if the flow rate being diverted to the pond is adequate to fill the pond while maintaining the pond level. The length of time to fill the pond will help determine if the flow rate is adequate for the size of pond being proposed. This number should be between 1 and 365 days for a project to be successful.
Days Required to Fill the Pond at 13,000 gallons per day	-1193	The "Days Required to Fill the Pond at 13,000 gallons per day" is calculated converting the "Pond Capacity" and the "Maximum Daily Maintenance Volume" to gallons. The "Pond Capacity" is then divided by 13,000 gallons minus the "Maximum Daily Maintenance Volume" in gallons to determine the number of days to fill pond. This number should be between 1 and 365 if this pond is to described as a domestic use.

User Input
Calculated value
Formula Explanations

Evaporation Loss Calculation

FILE NUMBER	65-22705 Pond 2
REVIEWER	Dan Nelson
DATE	1/21/2014

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

The acronyms used on the Kimberly Research Center website are defined below:
P = Precipitation
ET= Evapotranspiration
P _d = Precipitation deficit
P _d =ET-P

User Input
Calculated value
Formula Explanations

USING THIS SPREADSHEET

To ascertain the evaporation from a pond, you will need to go to the Kimberly Research Center website. The link is found below. This web site provides the Precipitation Deficit for the area where the pond is located. The Precipitation Deficit is the total amount of free pan 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, and the entire state is pretty much covered. 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.

Found at: <http://www.kimberly.uidaho.edu/ETIdaho/online.php>

Precipitation Deficit

Station: Twin Falls 2 NNE (NWS -- 109294)

Month	mm/day ¹	Days per month	mm/Month
Jan	0.00	31	0.00
Feb	0.00	28	0.00
March	0.00	31	0.00
April	0.39	30	11.70
May	0.88	31	27.28
June	1.82	30	54.60
July	3.44	31	106.64
August	2.88	31	89.28
September	1.49	30	44.70
October	0.20	31	6.20
November	0.00	30	0.00
December	0.00	31	0.00

PLEASE NOTE: We cannot use the season average, because there are several areas in Northern Idaho with a negative Precipitation Deficit. Therefore, we must enter each monthly deficit, and enter in a zero (0) for each negative month. The reason for this is that precipitation can only offset evaporation to the extent of the evaporation.

Please enter the daily average Precipitation Deficit as shown in the example below.

Although it has sometimes been useful to consider wintertime evaporation to be zero, Allen and Robison (2007, p. 169) noted, "Evaporation during nongrowing (wintertime) periods varies widely"

¹Negative monthly mean values should be entered in the above table as "0".

Total mm/year = 340.40

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

$$(\text{340.40} \div \text{304.8}) \times \text{8.71} = \text{9.7 AFA}$$

Surface Area of Pond is automatically Carried over from the Seepage Loss Sheet.

SEEPAGE CALCULATIONS

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

FILE NUMBER	65-22705 Pond 2
REVIEWER	Dan Nelson
DATE	1/21/2014

User Input
Calculated value
Formula Explanations

INPUTS

SQ. FT. Calculator Pond Surface area in acres
8.7139

POND SURFACE AREA (SQ. FT.)	379578
-----------------------------	--------

SUGGESTED SEEPAGE RATE (FT/DAY)	0.0000
---------------------------------	--------

Use the table below to find the "SUGGESTED SEEPAGE RATES".

FORMULA: (Surface Area X Seepage Rate) / 7.48 = Gallons Per Day loss

CONVERT TO GPD	0	GPD
----------------	---	-----

TOTAL SEEPAGE LOSS (AFA)	0.0	AFA
--------------------------	-----	-----

SUGGESTED SEEPAGE RATES FOR DIFFERENT SOIL TYPES:
GW, GP, GM, GC, SW, SP and SM (silty sand, sand silt mixtures and gravel mixtures) = 0.20 ft per day
OL and ML (inorganic silts - very fine sands, silty, or clayey fine sands) = 0.016 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 with shallow 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 <X:\Spatial\Soils\USCS\PondSoils.lyr>. Use "0" if the ponds intersect the water table.

TOTAL STORAGE

FILE NUMBER	65-22705 Pond 3
REVIEWER	Dan Nelson
DATE	1/21/2014

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

Surface Area (in Acres)	0.31639119	"Surface Area" is automatically carried over from the "Seepage Loss Sheet"
Average Pond Depth (in feet)	4	"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 you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above.
Pond Capacity (in acre feet)	1.26556474	

Volume Needed Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (in acre feet)	0	The "Volume Needed Above Initial Fill" is the acre-feet of water required to meet <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). PLEASE 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 (in acre feet)	0.0	The "Estimated Seepage Loss" is automatically carried over from the Seepage Loss Sheet
Estimated Evaporation Loss (in acre feet)	0.4	The "Estimated Evaporation Loss" is automatically carried over from the Evaporation Loss Sheet
Total Volume Required (in acre feet)	1.6	"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.

Flow Rate Into Pond (in cfs)	1.00	The "Flow Rate" Into the Pond depicts the actual flow either measured or estimated into the pond.
Highest Daily Evaporation Rate From Evaporation Tab. (in mm/day)	3.44	This number is automatically selected by picking the highest recorded number in the "Precipitation Deficit Table".
Maximum Required Daily Maintenance Volume (in acre feet per day)	0.00	"Maximum Required Daily Maintenance Volume" is the maximum volume of water needed on any given day during the year, and is calculated by adding the highest daily evaporation loss to the average daily seepage loss in acre feet. The average daily seepage loss is calculated by dividing the "Estimated Seepage Loss" by 365 days. This is acceptable, since the seepage rate shouldn't vary throughout the season unless the pond completely freezes over during the winter months. The highest daily evaporation loss is calculated by dividing the Highest Daily Evaporation Rate by the 304.8 conversion factor and multiplying this number by the pond surface area to attain a combined daily acre feet requirement.
Minimum Maintenance Flow (in cfs)	0.00	The "Minimum Maintenance Flow" is the minimum amount of flow required to maintain the level of the pond. This number is determine by dividing the "Maximum Required Daily Maintenance Volume" by 1.9835. This flow can be used to determine if the flow rate into the pond is adequate to maintain the pond level.
Days Required to Fill the Pond	1	The "Days Required to Fill the Pond" is calculated by dividing the "Pond Capacity" by the "Flow Rate" minus "Minimum Maintenance Flow" multiplied by 1.9835. This section will assist you in determining if the flow rate being diverted to the pond is adequate to fill the pond while maintaining the pond level. The length of time to fill the pond will help determine if the flow rate is adequate for the size of pond being proposed. This number should be between 1 and 365 days for a project to be successful.
Days Required to Fill the Pond at 13,000 gallons per day	35	The "Days Required to Fill the Pond at 13,000 gallons per day" is calculated converting the "Pond Capacity" and the "Maximum Daily Maintenance Volume" to gallons. The "Pond Capacity" is then divided by 13,000 gallons minus the "Maximum Daily Maintenance Volume" in gallons to determine the number of days to fill pond. This number should be between 1 and 365 if this pond is to described as a domestic use.

User Input
Calculated value
Formula Explanations

Evaporation Loss Calculation

FILE NUMBER	65-22705 Pond 3
REVIEWER	Dan Nelson
DATE	1/21/2014

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

The acronyms used on the Kimberly Research Center website are defined below:
P = Precipitation
ET= Evapotranspiration
P _d = Precipitation deficit
P _d =ET-P

User Input
Calculated value
Formula Explanations

USING THIS SPREADSHEET

To ascertain the evaporation from a pond, you will need to go to the Kimberley Research Center website. The link is found below. This web site provides the Precipitation Deficit for the area where the pond is located. The Precipitation Deficit is the total amount of free pan 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, and the entire state is pretty much covered. 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 .

Found at: <http://www.kimberly.uidaho.edu/ETIdaho/online.php>

Precipitation Deficit

Station: Twin Falls 2 NNE (NWS - 109294)

Month	mm/day ¹	Days per month	mm/Month
Jan	0.00	31	0.00
Feb	0.00	28	0.00
March	0.00	31	0.00
April	0.39	30	11.70
May	0.88	31	27.28
June	1.82	30	54.60
July	3.44	31	106.64
August	2.88	31	89.28
September	1.49	30	44.70
October	0.20	31	6.20
November	0.00	30	0.00
December	0.00	31	0.00

PLEASE NOTE: We cannot use the season average, because there are several areas in Northern Idaho with a negative Precipitation Deficit. Therefore, we must enter each monthly deficit, and enter in a zero (0) for each negative month. The reason for this is that precipitation can only offset evaporation to the extent of the evaporation.

Please enter the daily average Precipitation Deficit as shown in the example below.

Although it has sometimes been useful to consider wintertime evaporation to be zero, Allen and Robison (2007, p. 169) noted, "Evaporation during nongrowing (wintertime) periods varies widely"

¹Negative monthly mean values should be entered in the above table as "0".

Total mm/year = 340.40

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

(340.40 ÷ 304.8) X 0.32 = 0.4 AFA

Surface Area of Pond is automatically Carried over from the Seepage Loss Sheet.

SEEPAGE CALCULATIONS

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

FILE NUMBER	65-22705 Pond 3
REVIEWER	Dan Nelson
DATE	1/21/2014

User Input
Calculated value
Formula Explanations

INPUTS

SQ. FT. Calculator Pond Surface area in acres
0.3164

POND SURFACE AREA (SQ. FT.)	13782
-----------------------------	-------

SUGGESTED SEEPAGE RATE (FT/DAY)	0.0000
---------------------------------	--------

Use the table below to find the "SUGGESTED SEEPAGE RATES".

FORMULA: (Surface Area X Seepage Rate) / 7.48 = Gallons Per Day loss

CONVERT TO GPD	0	GPD
----------------	---	-----

TOTAL SEEPAGE LOSS (AFA)	0.0	AFA
--------------------------	-----	-----

SUGGESTED SEEPAGE RATES FOR DIFFERENT SOIL TYPES:
GW, GP, GM, GC, SW, SP and SM (silty sand, sand silt mixtures and gravel mixtures) = 0.20 ft per day
OL and ML (inorganic silts - very fine sands, silty, or clayey fine sands) = 0.016 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 with shallow 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 <X:\Spatial\Soils\USCS\PondSoils.lyr>. Use "0" if the ponds intersect the water table.

TOTAL STORAGE

FILE NUMBER	65-22705 Pond 4
REVIEWER	Dan Nelson
DATE	1/21/2014

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

Surface Area (in Acres)	6.62853535	"Surface Area" is automatically carried over from the "Seepage Loss Sheet"
Average Pond Depth (in feet)	8	"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
Pond Capacity (in acre feet)	53.0282828	you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above.

Volume Needed Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (in acre feet)	0	The "Volume Needed Above Initial Fill" is the acre-feet of water required to meet <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). PLEASE 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 (in acre feet)	0.0	The "Estimated Seepage Loss" is automatically carried over from the Seepage Loss Sheet
Estimated Evaporation Loss (in acre feet)	7.4	The "Estimated Evaporation Loss" is automatically carried over from the Evaporation Loss Sheet
Total Volume Required (in acre feet)	60.4	"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.

Flow Rate Into Pond (in cfs)	1.00	The "Flow Rate" Into the Pond depicts the actual flow either measured or estimated into the pond.
Highest Daily Evaporation Rate From Evaporation Tab. (in mm/day)	3.44	This number is automatically selected by picking the highest recorded number in the "Precipitation Deficit Table".
Maximum Required Daily Maintenance Volume (in acre feet per day)	0.07	"Maximum Required Daily Maintenance Volume" is the maximum volume of water needed on any given day during the year, and is calculated by adding the highest daily evaporation loss to the average daily seepage loss in acre feet. The average daily seepage loss is calculated by dividing the "Estimated Seepage Loss" by 365 days. This is acceptable, since the seepage rate shouldn't vary throughout the season unless the pond completely freezes over during the winter months. The highest daily evaporation loss is calculated by dividing the Highest Daily Evaporation Rate by the 304.8 conversion factor and multiplying this number by the pond surface area to attain a combined daily acre feet requirement.
Minimum Maintenance Flow (in cfs)	0.04	The "Minimum Maintenance Flow" is the minimum amount of flow required to maintain the level of the pond. This number is determine by dividing the "Maximum Required Daily Maintenance Volume" by 1.9835. This flow can be used to determine if the flow rate into the pond is adequate to maintain the pond level.
Days Required to Fill the Pond	28	The "Days Required to Fill the Pond" is calculated by dividing the "Pond Capacity" by the "Flow Rate" minus "Minimum Maintenance Flow" multiplied by 1.9835. This section will assist you in determining if the flow rate being diverted to the pond is adequate to fill the pond while maintaining the pond level. The length of time to fill the pond will help determine if the flow rate is adequate for the size of pond being proposed. This number should be between 1 and 365 days for a project to be successful.
Days Required to Fill the Pond at 13,000 gallons per day	-1519	The "Days Required to Fill the Pond at 13,000 gallons per day" is calculated converting the "Pond Capacity" and the "Maximum Daily Maintenance Volume" to gallons. The "Pond Capacity" is then divided by 13,000 gallons minus the "Maximum Daily Maintenance Volume" in gallons to determine the number of days to fill pond. This number should be between 1 and 365 if this pond is to described as a domestic use.

User Input
Calculated value
Formula Explanations

Evaporation Loss Calculation

FILE NUMBER	65-21705 Pond 4
REVIEWER	Dan Nelson
DATE	1/21/2014

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

The acronyms used on the Kimberly Research Center website are defined below:
P = Precipitation
ET= Evapotranspiration
P _d = Precipitation deficit
P _d =ET-P

User Input
Calculated value
Formula Explanations

USING THIS SPREADSHEET

To ascertain the evaporation from a pond, you will need to go to the Kimberley Research Center website. The link is found below. This web site provides the Precipitation Deficit for the area where the pond is located. The Precipitation Deficit is the total amount of free pan 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, and the entire state is pretty much covered. 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.

Found at: <http://www.kimberly.uidaho.edu/ETIdaho/online.php>

Precipitation Deficit

Station: Twin Falls 2 NNE (NWS -- 109294)

Month	mm/day ¹	Days per month	mm/Month
Jan	0.00	31	0.00
Feb	0.00	28	0.00
March	0.00	31	0.00
April	0.39	30	11.70
May	0.88	31	27.28
June	1.82	30	54.60
July	3.44	31	106.64
August	2.88	31	89.28
September	1.49	30	44.70
October	0.20	31	6.20
November	0.00	30	0.00
December	0.00	31	0.00

PLEASE NOTE: We cannot use the season average, because there are several areas in Northern Idaho with a negative Precipitation Deficit. Therefore, we must enter each monthly deficit, and enter in a zero (0) for each negative month. The reason for this is that precipitation can only offset evaporation to the extent of the evaporation.

Please enter the daily average Precipitation Deficit as shown in the example below.

Although it has sometimes been useful to consider wintertime evaporation to be zero, Allen and Robison (2007, p. 169) noted, "Evaporation during nongrowing (wintertime) periods varies widely"

¹Negative monthly mean values should be entered in the above table as "0".

Total mm/year = 340.40

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

(340.40) ÷ 304.8) X 6.63 = 7.4 AFA

Surface Area of Pond is automatically Carried over from the Seepage Loss Sheet.

SEEPAGE CALCULATIONS

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

FILE NUMBER	65-21705 Pond 4
REVIEWER	Dan Nelson
DATE	1/21/2014

User Input
Calculated value
Formula Explanations

INPUTS

SQ. FT. Calculator Pond Surface area in acres
6.6285

POND SURFACE AREA (SQ. FT.)	288739
-----------------------------	--------

SUGGESTED SEEPAGE RATE (FT/DAY)	0.0000
---------------------------------	--------

Use the table below to find the "SUGGESTED SEEPAGE RATES".

FORMULA: (Surface Area X Seepage Rate) / 7.48 = Gallons Per Day loss

CONVERT TO GPD	0	GPD
----------------	---	-----

TOTAL SEEPAGE LOSS (AFA)	0.0	AFA
--------------------------	-----	-----

SUGGESTED SEEPAGE RATES FOR DIFFERENT SOIL TYPES:
GW, GP, GM, GC, SW, SP and SM (silty sand, sand silt mixtures and gravel mixtures) = 0.20 ft per day
OL and ML (inorganic silts - very fine sands, silty, or clayey fine sands) = 0.016 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 with shallow 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 <X:\Spatial\Soils\USCS\PondSoils.lyr>. Use "0" if the ponds intersect the water table.