

Nelson, Dan

From: Terry Scanlan <TScanlan@spfwater.com>
Sent: Friday, May 01, 2020 2:48 PM
To: Nelson, Dan
Subject: RE: 63-34765 Proof and Exam
Attachments: pond-loss-calculationtotal.pdf

Good catch Dan. There was a left-over calculation in the spreadsheet that I didn't catch. Here is an updated page.

From: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>
Sent: Friday, May 1, 2020 2:26 PM
To: Terry Scanlan <TScanlan@spfwater.com>
Subject: RE: 63-34765 Proof and Exam

Hi Terry,

I just went through the supplemental information, and I have a question. In your pond spreadsheet, you list the surface area of the pond as 0.1 acres and the average depth as 5 feet. However, you list the pond capacity as 0.8 ac-ft. The spreadsheet is set up to calculate the capacity by multiplying the surface area by the average depth, so the pond should have a capacity of 0.5 ac-ft ($0.1 \times 5 = 0.5$ ac-ft).

My calculation show the capacity of the pond is 0.5 ac-ft plus the evaporation loss of 0.2 af or a total storage use of 0.7 af. Could confirm my calculations or provide some reasoning why the capacity is higher than the standard calculations for pond calculation.

I have everything ready to go, I just you to let me know if you want to use my calculations or provide the justification for your calculations.

Thank you.

Dan Nelson

From: Terry Scanlan [<mailto:TScanlan@spfwater.com>]
Sent: Wednesday, April 29, 2020 10:41 AM
To: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>
Cc: elksprings55@gmail.com
Subject: RE: 63-34765 Proof and Exam

Dan –

Please see the attached supplement. Let me know if this is adequate, and whether you need me to send a hard copy. Thanks.

Terry

From: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>
Sent: Friday, April 17, 2020 3:13 PM
To: Terry Scanlan <TScanlan@spfwater.com>
Cc: elksprings55@gmail.com
Subject: RE: 63-34765 Proof and Exam

Hello Terry,

I received word back, and we can include the pond in the domestic use. However, we need to show that the permit holder doesn't divert more than 13,000 gallons per day from the spring and the pond. If the spring is running 2,160 gallons per day, then you would need to add any diversion from the pond for irrigation onto the 2,160 gallons. We will need a pond spreadsheet and a calculation showing the maximum daily evaporation and seepage rate. As long as you can show everything is less than 13,000 gpd, there shouldn't be any problems. I will place a condition on the license referencing the pond, so that future investigations will show the pond is covered.

The following is an example of what we would need:

Spring diversion to Home = 500 gallons
Spring diversion to Pond = 1,660
Irrigation from pond = 12 gpm X 60 min X 4 hours = 2,880 gallons
Pond seepage and evaporation = 2,000 gallons
Total Gallons = 7,040 Maximum Gallons Per Day.

I hope this helps. If you have any questions, please don't hesitate to contact me. If you can get this to me within the next couple of weeks, I think we can get this one licensed reasonably quickly.

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

From: Terry Scanlan [<mailto:TScanlan@spfwater.com>]
Sent: Monday, April 13, 2020 8:27 AM
To: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>
Cc: elksprings55@gmail.com
Subject: RE: 63-34765 Proof and Exam

Dan –

The diversion to the pond is within the 13,000 gpd authorized under the permit. The 1.5 gpm spring flow rate is equal to 2.4 afa, but I think that the spring flow declines during the summer so I expect the annual discharge volume from the spring is less than 2.4 af.

I listed a 1.2 af volume because it is the standard for domestic with outside irrigation. However, if we can go with a higher volume (2.4 af) we would be all set. Is that an option?

Terry

From: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>
Sent: Monday, April 13, 2020 8:15 AM
To: Terry Scanlan <TScanlan@spfwater.com>

Cc: elksprings55@gmail.com

Subject: RE: 63-34765 Proof and Exam

Hi Terry,

I received the field exam you sent in for 63-34735. I just did a quick glance at the field exam that you supplied, and the first thing I noticed was the pond. This permit did not include a storage use, it is only for in-house use and up to ½ acre of irrigation. A volume of 1.2 af is the standard for in-house use and yard irrigation, and wouldn't be adequate to cover the pond, home, and yard irrigation. What are your thoughts on covering the pond for this property?

Dan Nelson

From: Terry Scanlan [<mailto:TScanlan@spfwater.com>]

Sent: Saturday, April 11, 2020 2:18 PM

To: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>

Cc: elksprings55@gmail.com

Subject: 63-34765 Proof and Exam

Dan – Hard copies of signature pages will follow by US Mail.

Terry M. Scanlan, P.E., P.G. | Principal Engineer/Hydrogeologist

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Total Storage Calculations

FILE NUMBER	TBD
REVIEWER	SPF Water Engineer
DATE	4/27/2020

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

User Input
Calculated value
Formula Explanations

Surface Area (AC.)	0.1	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	5	"Average Pond Depth" depicts the actual depth of the pond either measured or estimated. Note: If you know the maximum depth and not the average depth, the Field Examiner's Handbook suggests multiplying the maximum depth by 0.4 to get the average depth, or you can use any method that seems reasonable to attain average depth.
Pond Capacity (AF)	0.5	Pond Capacity is calculated by multiplying the Pond Surface Area by the Average Pond Depth. If you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above. Note: If pond capacity is determined using a method shown on the "Pond Capacity" sheet, the user may need to modify the value of "Pond Capacity" (cell B9) manually. Note that if the value is modified manually, the formula will be altered for future use.
Multiple Fill Volume Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (AF)	0	The "Multiple Fill Volume Above Initial Fill" is the acre-feet of water required to meet a <i>from storage</i> component if the <i>from storage</i> component exceeds a one time fill. This section should not include the amount of water needed to fill the pond initially or the amount of water needed to maintain the pond level due to evaporation or seepage. For example: if a pond has a capacity of 5 acre feet and 2.5 acre feet of seepage and evaporation, but the pond is used for irrigation that requires 10 acre feet of from storage for the irrigation use, then you would insert 5 acre feet into this location (10 acre feet needed - 5 acre feet from the initial fill = 5 acre feet of additional storage needed). 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 (AF)	0.0	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	0.2	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	0.7	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 (CFS)	0.003	The "Flow Rate into Pond" depicts the actual flow, either measured or estimated, into the pond. For offstream facilities, this will be equivalent to "diversion to storage" rate.
Highest Daily Evaporation Rate From Evaporation Tab. (mm/Day)	5.48	This number is carried over from the "Evaporation Loss" sheet. It is the highest recorded number in the "Precipitation Deficit Table".
Required Daily Maintenance Volume (AF/Day)	0.002	"Required Daily Maintenance Volume" is the maximum volume of water needed on any given day during the year to maintain pond volume. It 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 (CFS)	0.001	The "Minimum Maintenance Flow" is the minimum amount of flow required to maintain the level of the pond. This number is determined 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	120	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. <i>If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond.</i>
Days Required to Fill the Pond at 13,000 Gallons per Day	13	Some water users may want to fill a pond under the 13,000 gallons per day domestic exemption. The "Days Required to Fill the Pond at 13,000 Gallons per Day" is calculated by converting the "Pond Capacity" and the "Required Daily Maintenance Volume" to gallons. The "Pond Capacity" is then divided by 13,000 gallons minus the "Required Daily Maintenance Volume" in gallons to determine the number of days to fill pond. <i>If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond.</i> Negative values indicate that the supply of 13,000 gallons per day is not enough volume to overcome the required daily maintenance volume; the pond will never fill.

Nelson, Dan

From: Grimm, Angie
Sent: Friday, April 17, 2020 2:32 PM
To: Nelson, Dan
Subject: RE: 63-34765 Proof and Exam

Dan,

I think it's ok to include a condition describing the pond on the license. Even though the spring only discharges 2160 gpd, the permit holder is storing water in the pond and the total use (directly from the spring and from the pond) should not exceed 13,000 gpd. If you think there is a better tool than the Memo 67 spreadsheet to document that I'm ok with it.

Thanks,
Angie

From: Nelson, Dan
Sent: Friday, April 17, 2020 11:55 AM
To: Grimm, Angie <Angie.Grimm@idwr.idaho.gov>
Subject: RE: 63-34765 Proof and Exam

Hi Angie,

Since the spring can only produce 2,160 gpd, I think we can definitely fit it into the 13,000 gpd criteria. I am good with not including the storage component, but I think we need to include the pond use in a condition. That way they would have something on records that authorizes the pond. Once we receive the spreadsheet from Terry, I think we could include condition 219 to ensure the pond doesn't magically grow in size.

If you are good with this, I will let Terry know.

Dan

From: Grimm, Angie
Sent: Friday, April 17, 2020 11:48 AM
To: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>
Subject: RE: 63-34765 Proof and Exam

Hi Dan,

After reading Memo 67 I offer the following thoughts:

1. I think we should ask Terry to do the spreadsheet in Memo 67 to demonstrate the total uses do not exceed 13,000 gpd (the amount the applicant said on the permit application would not be exceeded + permit condition).
2. Provided the Memo 67 spreadsheet does show the daily use doesn't exceed 13,000 gallons, I think we can license the permit with domestic use (no storage) and the volume should include the total annual volume used (pond included). My thinking for simply issuing the license as domestic use rather than including any storage component is based on the last paragraph on page 4 of Memo 67. It indicates if a ground water permit application is filed (even though it meets the exemption), we can issue that permit as domestic use

only with no storage. It stands to reason, in my mind, if we can do this with ground water there is no reason not to do it with surface water too. This also seems to legitimize, to some degree, the idea that it's ok to include a small pond of this nature within the domestic use originally permitted.

3. Issuing the license as domestic use (no storage) would also avoid the questions about whether a license amendment is needed or not.

What do you think?

Thanks,
Angie

From: Nelson, Dan
Sent: Monday, April 13, 2020 8:52 AM
To: Grimm, Angie <Angie.Grimm@idwr.idaho.gov>
Subject: FW: 63-34765 Proof and Exam

Hi Angie,

I did a quick look at Terry's exam and I noticed a pond on the property. Terry recommended a volume of 1.2 af, which would cover the home and the yard, but not the pond. I questioned Terry about this, and he wondered whether we could include the pond in the domestic use. The spring flows at 1.5 gpm or 2,160 gpd or 2.4 af per year, so it is under the 13,000 gpd requirement authorized by Administrative Memo #67 for a domestic use. However, no pond was mentioned in the application for permit. According to Terry the pond volume is under 1 af. I checked the surface area of the pond and it was 0.07 acres, so if the pond was 10 feet deep, it would be 0.7 af.

My thoughts are that I think we should require him to do a pond spreadsheet to show the volume required by the pond use, and add that amount onto the 1.2 af for the home and the yard irrigation. It appears as though they fill the ponds with the spring to allow irrigation water to be stored up for the yard and garden, because the spring has such a low flow rate. My only concern is that the pond was not mentioned in the application for permit, but I think requiring another permit for the pond would be a waste of money and time for both the permit holder and the Department.

What are your thoughts?

Dan Nelson

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Terry

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