

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 51-7292
Exam Date: 2/20/2015

1. Current Owner: ECHO WATER USERS ASSN INC
C/O CHARLES HONSINGER
PO BOX 2773
BOISE ID 83701-2773
(208)342-4591

UNITED STATES OF AMERICA ACTING THROUGH
USDI BUREAU OF LAND MANAGEMENT
IDAHO STATE OFFICE
1387 S VINNELL WAY
BOISE ID 83709-1657
(208) 373-4000

2. Accompanied by:

Phone No:

Address:

Relationship to Permit Holder:

3. **SOURCE**

EAST FORK BRUNEAU RIVER

TRIBUTARY

BRUNEAU RIVER

B. OVERLAP REVIEW

1. Other water rights with the same place of use: Overlap? ☒ Yes ☐ No

Water Right No.	Source	Purpose of Use	Basis
51-2440	CLOVER CREEK	STOCKWATER	DECREED
51-7056	CLOVER CREEK	STOCKWATER	DECREED

Comments: 2 water rights above come from "old" pump house. Combined use will be issued on conditions of approval.

2. Other water rights with the same point of diversion: Overlap? ☐ Yes ☒ No

Water Right No.	Source	Purpose of Use	Basis

Comments: No POD overlap.

C. DIVERSION AND DELIVERY SYSTEM

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

Source	Govt. Lot	¼	¼	¼	Sec.	Twp.	Rge.		County
EAST FORK BRUNEAU RIVER			SW	SW	23	11S	9E		OWYHEE

Method of Determination: Legal Description in permit validated by PLSS data and mapping.

Change in POD? ☐ Yes ☒ No

Amendment Required? ☐ Yes ☒ No

2. PLACE OF USE:

STOCKWATER FROM STORAGE, WILDLIFE FROM STORAGE, STOCKWATER

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
07S	08E	24	X			X													
07S	09E	19								X									
07S	09E	30													X				
07S	09E	32			X		X												
07S	09E	33											X						
08S	07E	7		X															
08S	07E	15											X						
08S	07E	17							X										
08S	07E	28		X			X												
08S	07E	29							X	X									
08S	07E	32													X			X	
08S	07E	33										X	X						
08S	07E	34									X					X			
08S	07E	36							X			X							
08S	08E	26	X																
08S	09E	4					X L3	X L4											
08S	09E	5						X L4											
08S	09E	8							X			X							
08S	09E	17											X						
08S	09E	18																X	
08S	09E	19									X								
08S	09E	20															X		
08S	09E	29		X															
08S	09E	32									X	X							
09S	07E	2											X	X					
09S	07E	8				X									X				
09S	07E	9										X							
09S	07E	13											X						
09S	07E	17		X														X	
09S	07E	20													X				
09S	07E	24																X	
09S	07E	26							X										
09S	07E	35							X										
09S	08E	22						X											
09S	08E	30									X	X L3							
09S	08E	31																X	

09S	08E	34											X					
09S	09E	1													X			
09S	09E	8	X				X											
09S	09E	10						X	X									
09S	09E	11		X				X				X			X			X
09S	09E	13										X						
09S	09E	14							X									X
09S	09E	17						X										
09S	09E	23											X				X	
09S	09E	25													X			
09S	09E	26		X				X										
09S	09E	27													X			
09S	09E	28																X
09S	09E	29				X												
09S	09E	31		X	X	X											X	X
09S	09E	33								X	X							
09S	09E	34	X	X														
09S	09E	36		X														
09S	10E	7		X				X							X			
09S	10E	8										X						
09S	10E	9								X								
09S	10E	17		X														
09S	10E	18													X			
09S	10E	20											X					
09S	10E	26				X					X							
09S	10E	27								X								
09S	10E	29													X			
09S	10E	30												X				
09S	10E	33					X											
09S	10E	35														X		
09S	10E	36										X						X
09S	11E	31											X					
													L4					
10S	07E	2	X															
			L1															
10S	08E	1										X						
10S	08E	3							X									
									L4									
10S	08E	4													X			
10S	08E	6							X									
									L3									
10S	08E	9					X											
10S	08E	10								X	X	X	X					

10S	08E	14					X											X
10S	09E	5									X			X				
10S	09E	7								X	X	X						
												L3						
10S	09E	8					X											
10S	09E	9												X				
10S	09E	11					X											
10S	09E	14					X	X										
10S	09E	21														X		
10S	09E	22												X	X	X		
10S	09E	25					X	X										
10S	09E	26					X											
10S	09E	27		X														
10S	09E	32					X				X							
10S	09E	36										X	X					
10S	10E	4					X											
10S	10E	20			X						X							
10S	10E	30								X								
										L1								
11S	09E	3									X			X				X
11S	09E	4									X							
11S	09E	11					X				X							
11S	09E	14			X						X							
11S	09E	16														X		
11S	09E	22													X			
11S	09E	23											X					

STOCKWATER STORAGE, WILDLIFE STORAGE

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
09S	08E	31																X	
09S	09E	31	X	X	X	X													
11S	09E	14								X									
11S	09E	23											X						

Method of Determination: Map of property submitted by land owner identifies POU clearly.

Change in POU? ☒ Yes ☐ No

Amendment Required? ☒ Yes ☐ No

3.

☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components.

Indicate weir size/pipe as applicable.

☒ 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
NA	NA	NA	NA	NA	NA

*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
Flow Tracker	Handheld ADV	Son Tek	--	P4554	--	2/18/2015

2. Measurements: Flow tracker used in ditch past headgate before entering the pond system.

E. FLOW CALCULATIONS

 X Additional Computation Sheets Attached

Measured Method:

Open ditch measurement was collected on site. Average flow rate was measured to be 1.2596 cfs. See discharge measurement summary attached to this report.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

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

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

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

2. Volume Calculations for Other Uses: STORAGE CAPACITY

Pond ID	Pond Capacity
11S 9E Sec 23	2.2
11S 9E Sec 14	4.0
9S 9E Sec 31	9.3
9S 8E Sec 31	6.7

Sum **22.2 af**

STOCKWATER

Admin. Memo #3 suggests 12 gpd/head. Permit suggests use for up to 10,000 sheep and 16,000 cattle.

$$16,000 \text{ head} \times 12 \text{ gpd/head} \times 365 \text{ d} = 7,008,000 \text{ g} = \mathbf{215.08 \text{ af}}$$

$$0.23 \text{ cfs} = \mathbf{166.5 \text{ af}} \quad . \quad 23 \text{ cfs} \times 262 \text{ days} \times 1.9835 = \mathbf{119.5 \text{ af}} \quad 28 \quad 03-31-2015$$

$$\# \text{ of fills needed to serve 16,000 cattle} = 215.08 / 22.2 = 9.7 \text{ fills}$$

$$\# \text{ of fills authorized by a diversion rate of 0.23 cfs} = 166.5 / 22.2 = 7.5 \text{ fills}$$

G. NARRATIVE/REMARKS/COMMENTS

Field exam was completed by Water Resource Agent Patrick Kelly and Staff Hydrologist Dan Nelson on February 20, 2015. Darcy Helmick, Land Manager and representative of Simplot escorted Dan and I to the diversion and provided guidance on the system.

An incomplete field exam was started by Steve Lester on July 8, 1993. Notes from that field exam were found to be difficult to interpret and a diversion rate was missing from the report. Three storage ponds separate from the pumping pond were found and not included in the 1993 report. At the time of our field exam in 2015, there are a total of four storage ponds that are used to deliver water to troughs. Historical aerial photography shows that all four ponds were built at the time of the December 1993 Statement of Completion, and so will be included in this licensing report.

Water is initially diverted out of Clover Creek by headgate installed at the bridge of Clover Three Creek Road. A ditch moves water into a pond and flows back into the Creek. From the pumping pond, water is moved to 3 other ponds via a 75 hp DEUTZ Corp diesel motor (model: TD20111041). Water was not being pumped from the pond at the time of our field exam, and because this was not the primary diversion, a diversion rate was not measured from the pump.

Water is pumped from the pumping pond 1.6 miles north to "Clover Creek Reservoir". From here, there are valves that direct water to the remaining 2 ponds 13 miles further north. Gravity flow drains water into troughs from the storage ponds.

A diversion rate was measured in the delivery ditch between the headgate and pumping pond. Water passes through the ditch into the pond and back into the river. A Son Tek Flow Tracker handheld ADV was used to measure velocity. A diversion rate of 1.2596 cfs was taken. Permit 51-7292 authorizes a diversion rate of 0.23 cfs. Flow Tracker results were printed and included in this report.

Aerial imagery was used to measure surface area using ArcMap tools. Depths of the ponds were taken from pond operator estimates. Evaporation rates were taken from a nearby weather station at similar elevation and climate type. Seepage is not a concern and was not included in the total storage estimates since the ponds are lined. Further details on total storage are attached to this report. A total storage volume of 22.5 af was calculated and is the volume of a onetime fill. Permit 51-7292 authorized the storage of 24.0 af. A new application for permit will need to be filed to account for additional storage and any refill.

Overlap review found 2 other water rights (51-2440 & 51-7056) owned by Echo Water Users Assn for parts of the POU. At the time of our field exam, we were informed that the diversion associated with these rights was the "old pump house" and water is no longer diverted at that location. The old pump house is located 10 linear miles downstream from the current diversion in use. A combined diversion rate of 0.72 cfs is authorized by WR 51-2440 & 51-7056, and a transfer may assist in making up some of the difference in diversion rate - if a transfer is allowed.

An amendment will be required to accurately identify Place of Use for the storage ponds and troughs. Because the stockwater from storage use was permitted for 22.0 af, it is 0.2 af short of the 22.2 af capacity of the ponds. To account for this, we will subtract 0.2 af from the wildlife from storage component of the right. This gives the stockwater component the full water capacity of the storage ponds under this right.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS**1. Recommended Amounts**

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
WILDLIFE FROM STORAGE	1/01 to 12/31		1.80 AF
STOCKWATER STORAGE	1/01 to 12/31		22.2 AF
WILDLIFE STORAGE	1/01 to 12/31		22.2 AF
STOCKWATER FROM STORAGE	2/15 to 12/01		22.2 AF
STOCKWATER	2/15 to 12/01	0.230 CFS	~~166.5 AF~~ 119.5 at
DIVERSION TO STORAGE	2/15 to 12/01	0.230 CFS	
<u>Totals:</u>		0.230 CFS	~~166.5 AF~~ 119.5 at

CS
3-31-2015

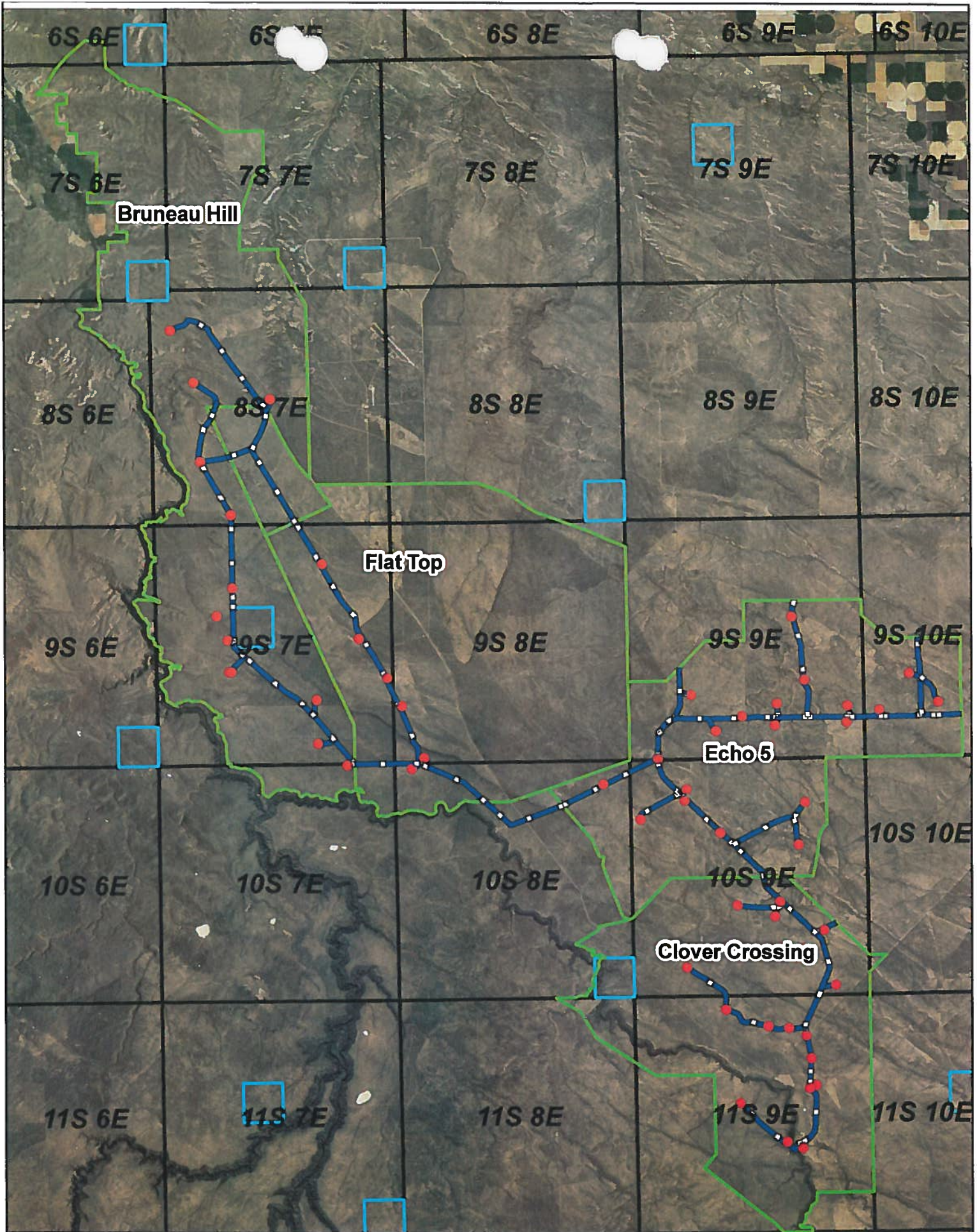
2. Recommended Amendments

☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☐ None

☒ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

I. AUTHENTICATION

Field Examiner's Name Patrick Miley Date 2/20/2015
 Reviewer Camela Skaggs Date 3/31/2015



- State Owned Land
- BLM Allotments
- Water Pipeline
- Trough Locations
- Trough Locations

Data Source:
Water pipeline, trough and grazing allotments
data provided by the BLM Jerbridge Field Office
Twin Falls, Idaho
Obtained June 2, 2011

ECHO WATER SYSTEM WITHIN The Clover Crossing, Flat Top, Echo 5 and Bruneau Hill BLM Grazing Allotments Owyhee County, Idaho

This map is a graphical representation of data.
The J.R. Simplot Company does not warrant the
accuracy or currency of the data it has provided
and does not guarantee the suitability of the data
for any purpose, expressed or implied.

Simplot



Map Projection = UTM Zone 11 NAD83
File Date: 10/20/11

Total Storage Calculations (PUMP Pond)

FILE NUMBER	51-7292
REVIEWER	Patrick Kelly
DATE	2/25/2015

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.)	0.56	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	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 seems reasonable to attain average depth.
Pond Capacity (AF)	2.24	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)	1.6	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	3.9	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)	1.25	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)	5.50	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)	0.01	"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)	0.01	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	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. <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	75	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.

Total Storage Calculations (Clover Creek Res)

FILE NUMBER	51-7292
REVIEWER	Patrick Kelly
DATE	2/25/2015

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.)	0.66	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	6	"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)	3.96	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)	1.9	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	5.9	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)	1.25	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)	5.50	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)	0.01	"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)	0.01	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	2	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. 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.
Days Required to Fill the Pond at 13,000 Gallons per Day	141	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. 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. 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.

Total Storage Calculations (NE Pond)

FILE NUMBER	51-7292
REVIEWER	Patrick Kelly
DATE	2/25/2015

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.)	1.55	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	6	"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)	9.3	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 " <u>From Storage</u> " 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)	4.5	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	13.8	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)	1.25	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)	5.50	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)	0.03	"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)	0.01	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	4	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	780	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.

Total Storage Calculations (NW Pond)

FILE NUMBER	51-7292
REVIEWER	Patrick Kelly
DATE	2/25/2015

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.)	1.11	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	6	"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)	6.66	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)	3.2	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	9.9	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)	1.25	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)	5.50	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)	0.02	"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)	0.01	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	3	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	335	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.

Discharge Measurement Summary

Date Generated: Fri Feb 27 2015

File Information

File Name 517292.WAD
Start Date and Time 2015/02/25 10:01:22

Site Details

Site Name
Operator(s) DAN

System Information

Sensor Type FlowTracker
Serial # P4554
CPU Firmware Version 3.9
Software Ver 2.30
Mounting Correction 0.0%

Units (English Units)

Distance ft
Velocity ft/s
Area ft²
Discharge cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.3%	2.5%
Velocity	1.4%	11.6%
Width	0.2%	0.2%
Method	2.9%	-
# Stations	3.9%	-
Overall	5.1%	12.0%

Summary

Averaging Int.	40	# Stations	13
Start Edge	LEW	Total Width	6.800
Mean SNR	30.9 dB	Total Area	4.590
Mean Temp	32.71 °F	Mean Depth	0.675
Disch. Equation	Mid-Section	Mean Velocity	0.2744
		Total Discharge	1.2596

Measurement Results

St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	10:01	1.40	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0
1	10:01	2.50	0.6	0.500	0.6	0.200	0.3727	1.00	0.3727	0.400	0.1491	11.8
2	10:02	3.00	0.6	0.900	0.6	0.360	0.1490	1.00	0.1490	0.450	0.0670	5.3
3	10:04	3.50	0.6	1.000	0.6	0.400	0.5417	1.00	0.5417	0.500	0.2708	21.5
4	10:05	4.00	0.6	1.000	0.6	0.400	0.5217	1.00	0.5217	0.500	0.2608	20.7
5	10:06	4.50	0.6	1.000	0.6	0.400	0.3658	1.00	0.3658	0.500	0.1829	14.5
6	10:07	5.00	0.6	0.900	0.6	0.360	0.2425	1.00	0.2425	0.450	0.1091	8.7
7	10:08	5.50	0.6	0.900	0.6	0.360	0.2034	1.00	0.2034	0.450	0.0915	7.3
8	10:09	6.00	0.6	0.800	0.6	0.320	0.1952	1.00	0.1952	0.400	0.0781	6.2
9	10:11	6.50	0.6	0.800	0.6	0.320	0.1247	1.00	0.1247	0.400	0.0499	4.0
10	10:13	7.00	0.6	0.600	0.6	0.240	0.0249	1.00	0.0249	0.300	0.0075	0.6
11	10:14	7.50	0.6	0.400	0.6	0.160	-0.0295	1.00	-0.0295	0.240	-0.0071	-0.6
12	10:14	8.20	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0

Rows in italics indicate a QC warning. See the Quality Control page of this report for more information.

Discharge Measurement Summary

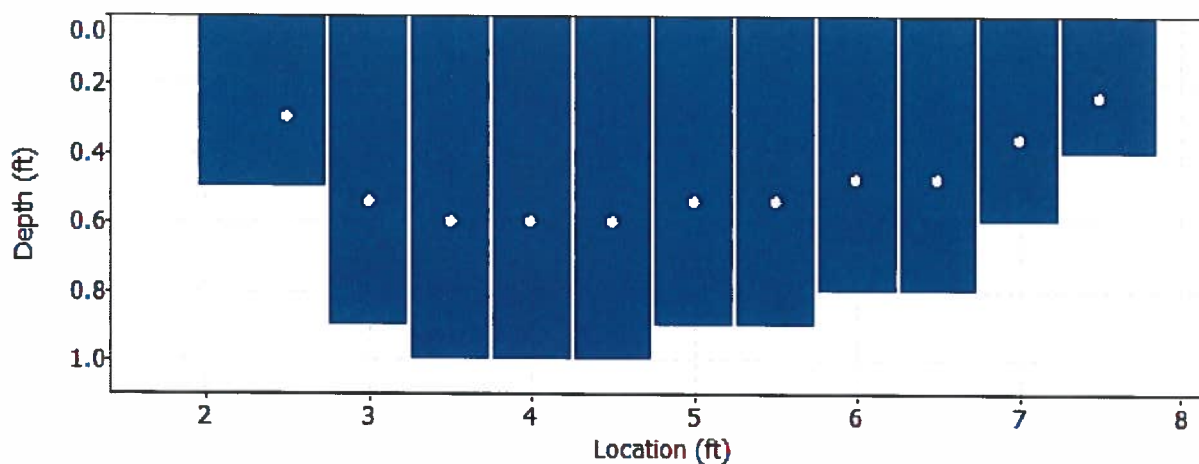
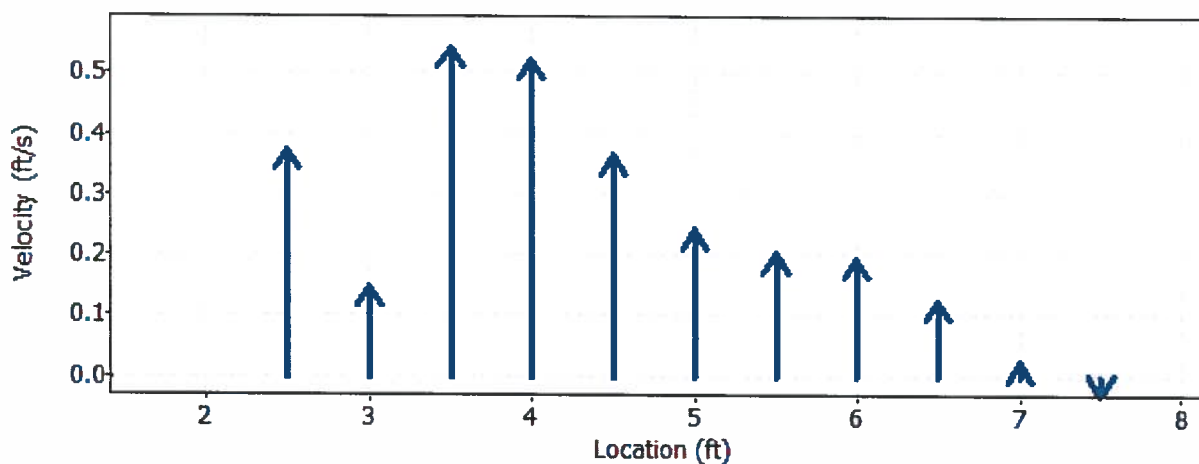
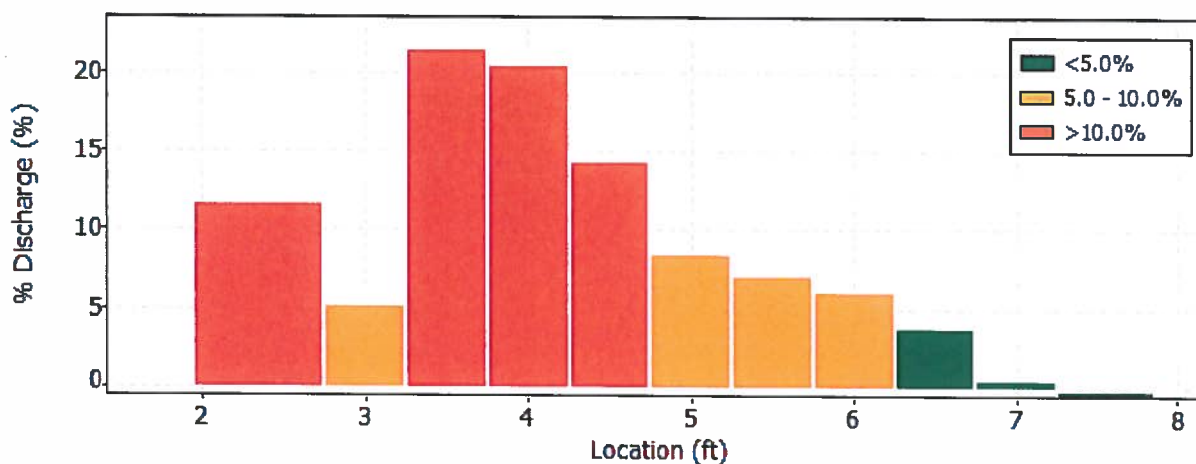
Date Generated: Fri Feb 27 2015

File Information

File Name 517292.WAD
Start Date and Time 2015/02/25 10:01:22

Site Details

Site Name
Operator(s) DAN



Discharge Measurement Summary

Date Generated: Fri Feb 27 2015

File Information

File Name 517292.WAD
Start Date and Time 2015/02/25 10:01:22

Site Details

Site Name
Operator(s) DAN

Quality Control

St	Loc	%Dep	Message
10	7.00	0.6	High angle: 23
		0.6	SNR (41.7) is different from typical SNR (30.9)
11	7.50	0.6	High angle: -169
		0.6	SNR (44.0) is different from typical SNR (30.9)