

December 20, 2017

Tim Luke
Idaho Department of Water Resources
PO Box 83720
Boise, ID 83720-0098

Subject: Sandy Pond Recharge 2017 Annual Report

Dear Tim,

Enclosed are daily data and calculations for recharge at Sandy Ponds during this year. SCADA data for the pond's W-26 inflow weir show that inflow to Sandy Ponds began on April 2. Per SPF's observations on April 12, the upper pond was full and spilling into the overflow recharge pond and the downstream ponds were filling. SCADA data for W-26 flow stopped on October 16 due to power being shut down at Morris Pond where the data is relayed out to SPF. Butch Morris said that the canal flow stopped very soon after October 16, so a few days of inflow and subsequent recharge are missing from the record. The W-26 measurement record for 2017 was much improved over 2016 and we are pleased with its operation.

Outflows from the ponds include 1) Morris's pond pump measured with a magnetic flowmeter, 2) Morris's pond overflow weir, 3) flow into the Sandy Pipe Vault measured with an ultrasonic meter, 4) evaporation estimated based on average ETIdaho information, and 5) recharge to the aquifer.

Morris's pond pump's magnetic flowmeter indicated an annual volume of 303.1 acre-feet. SCADA readings for this site indicated an annual volume of 220.2 acre-feet. The cause of the discrepancy is unclear and the direct flowmeter readings are used for this report.

Total volume measured at the Morris Pond Overflow Weir is 11.7 acre-feet.

The ultrasonic flowmeter installed on the Sandy Pipe Outflow (inflow to the Vault) indicated a year-end total volume of 2077.6 acre-feet. Corbin Knowles had reset the volume reading to zero on May 5 when flow first started for the season. The raw SCADA data for this meter indicates a total annual volume of 3065 acre-feet. Both volumes are incorrect, as the ultrasonic flowmeter transmitted erroneous flows to the SCADA logger system at numerous times throughout the season as observed by SPF, Corbin Knowles, and Butch Morris. These values ranged from a few cfs to nearly 40 cfs. When we were able to confirm these logged flows were in error, adjustments were made to the daily record. This attached record includes both the raw recorded and adjusted values for Sandy Pipeline flows into the vault. The adjusted Sandy Pipe Outflow is 1103.6 acre-feet.

Flowmeters indicated 691 acre feet was pumped from the vault while 46.6 acre feet was injected into the vault from the Farmers Box (see table below). The difference between Sandy Pipe inflows, pumping, and Farmers Box inflow is $1103.6 - 644.4 = 459.2$ acre feet. The operating season this year, from first to last pumping from the vault, lasted 142 days. Therefore, the calculated average spill from the vault to Curren Ditch is 1.6 cfs ($459.2 \text{ af} / 142 \text{ days} / 1.9835 \text{ af per cfs-day} = 1.6 \text{ cfs}$). This spill rate seems to be high compared to SPF's observations this year, but is more reasonable when contrasted to the raw recorded SCADA data or the flowmeter volume. Conversations with Butch Morris also confirmed the 1.6 cfs average flow is about right.

Pumping from Sandy Vault and injection from Farmers Box:

Morris Vault Pump	76.0
Musser Vault Pump	523.5
Candy Vault Pump	91.5
Farmers Box Inflow	<u>-46.6</u>

Pumped – Curren Inflow: 644.4 acre feet

Evaporation from the ponds is calculated based on ETIdaho's Hagerman station for 243 days (April 2 through November 30) for the full 44-acre surface area and totals 122.29 acre-feet.

Total computed recharge is:

W-26 Inflow	8830.41
Morris Pond Pump	- 303.10
Morris Pond Weir	- 11.73
Sandy Pipe Outflow	-1103.59
Evaporation	<u>- 122.29</u>
Total Recharge	7289.70 acre-feet

Please let me know if you have any questions.

Sincerely,

Scott N. King, P.E.
Supervising Engineer



cc: T.J. Budge

File: 535.0240

Hagerman

Open water shallow systems (ponds, streams)

[Precipitation Deficit \(Click here for a graph\)](#)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Growing Season ^a	Non Growing Season ^b	Annual
Mean	mm/day												mm		
Monthly	-0.17	0.27	1.54	2.74	3.71	4.74	5.42	4.75	3.93	2.29	0.21	-0.94	871	0	871
Days	0	0	0	29	31	30	31	31	30	31	30	0			243
Monthly Total mm	0	0	0	79.5	115.0	142.2	168.0	147.3	117.9	71.0	6.3	0			847.13
Monthly Total af	0	0	0	11.5	16.6	20.5	24.3	21.3	17.0	10.2	0.9	0			122.29