

MEMORANDUM

TO: File 85-~~7664~~ *7460 DAV 6-23-2014*
FROM: Daniel Nelson – Staff Hydrologist
DATE: June 17, 2014
SUBJECT: Review of System for Licensing

Sandy Hemenway performed the field exam on this permit and was unable to complete the field report due to retirement. Sandy properly located the point of diversion and place of use for this permit, but there were several issues that needed to be resolved prior to licensing of this permit. Due to the amount of information that was missing, I went back to the site and worked with the hatchery Manager, Aaron Penney.

Ms. Hemenway performed a theoretical calculation for the two pumps for this system and came up with a diversion rate of 3.88 cfs. However, these pumps use a variable speed drive, so a theoretical is not recommended in this case. I measured the surface water diversions and found the maximum diversion rate was 2.58 cfs. This measurement seems more suitable for the system.

Instead of doing the calculations for the storage component based on the actual tank size, Ms. Hemenway used ArcMap to get a general volume. I have attached a spreadsheet showing the volume of the tanks based on their size, so I am recommending a volume of 0.4 acre feet. An X35 condition will be needed to account for the same storage on both water rights 85-7660 and 85-7664.

I have included a fish propagation worksheet with this memo, and it looks as though they are operating this facility within normal standards. This facility operates between April 1 and June 15th of each year or 43 days. The total volume for fish propagation will be the rate of flow of 2.58 cfs for 43 days or 220 acre-feet minus the storage component of 0.4 acre feet for a balance of 219.6 acre feet.

I am recommending this permit as follows:

Diversion to storage = 2.58 cfs
Fish propagation storage = 0.4 af
Fish propagation = 2.58 cfs and 219.6 af
For a total of 2.58 cfs and 220 af.

POLYSONIC READINGS

PERMIT #: 85-7660

POINT OF DIVERSION

South Fork Clearwater River Diversion

FIRST SET OF INFORMATION:

SET-UP IMPUTE DATA USED DURING
PREPARATION FOR FLOW MEASUREMENTS.

SECOND SET OF INFORMATION:

THESE ARE THE READINGS TAKEN FOR
THIS PUMP. THE TOTAL FLOW WAS
AVERAGED OVER A 10 MINUTE READING.

FLOWS IN GALLONS PER MINUTE (GPM)

1160 GPM FLOW RATE

FLOWS IN CUBIC FEET PER SECOND (CFS)

1160 GPM / 448.8 = 2.58 CFS FLOW RATE

	15:03+	1.170E 3GPM	00R
		+00000 *10 G	00R
		-00000 *10 G	00R
	15:04+	1.155E 3GPM	00R
		+00116 *10 G	00R
		-00000 *10 G	00R
	15:05+	1.155E 3GPM	00R
		+00231 *10 G	00R
		-00000 *10 G	00R
MODE SELECT	15:06+	1.175E 3GPM	00R
INPUT		+00348 *10 G	00R
		-00000 *10 G	00R
OUTER DIAMETER	15:07+	1.165E 3GPM	00R
8.6299 IN		+00465 *10 G	00R
		-00000 *10 G	00R
PIPE MATERIAL	15:08+	1.175E 3GPM	00R
? PUC		+00581 *10 G	00R
		-00000 *10 G	00R
WALL THICKNESS	15:09+	1.164E 3GPM	00R
0.3591 IN		+00693 *10 G	00R
		-00000 *10 G	00R
INNER LINING	15:10+	1.134E 3GPM	00R
? NO LING. 1^		+00811 *10 G	00R
		-00000 *10 G	00R
KIND OF FLUID	15:11+	1.161E 3GPM	00R
? WATER		+00928 *10 G	00R
		-00000 *10 G	00R
SENSOR MOUNTING	15:12+	1.152E 3GPM	00R
? U		+01044 *10 G	00R
		-00000 *10 G	00R
TYPE OF SENSOR	15:13+	1.157E 3GPM	00R
? SMALL		+01160 *10 G	00R
		-00000 *10 G	00R
DATA CHANGE			
? NO			
SPACING			
6.264 IN U			
ZERO MODE			
CLEAR			
ZERO MODE			
AUT ZERO			

Permits 85-7660 an 85-7664

Storage Tank Calculations

By Dan Nelson

Number of Tanks	Tank Diameter in feet	Tank Depth in feet	Volume in Cubic Feet per tank	Volume of all tanks in Cubic Feet	Volume in Acre Feet
10	20	5	1570	15700	0.3604224

The total volume for this system is 0.4 acre feet.

Fish Propagation Worksheet

Determination of Density Index = Weight of Fish Produced in pounds/ (Fish length in inches X Facility Volume in ft³)		
Fish Weight	5,000.00	
Length	3.00	
Volume	1,570.00	
Density Index	1.06	
Under Ideal Conditions, Density Index should be between 0.4 and 1		

Determination of facility exchange = Diversion Rate in cfs X 3600/ Facility Volume in ft³		
Diversion Rate	2.83	
Facility Volume	15,700.00	
Exchanges per Hour	0.65	
Under Ideal Conditions, Exchanges per Day should be 2.5 for Trout.		

Diversion Capacity Calculation = Diversion Rate in cfs X 1.9835 X 43 days		
Diversion Rate	2.83	
Total Volume	241.37212	

Determination of Flow Index = Weight in Pounds/ (Fish Length X Diversion Rate in gpm).		
Fish Weight	5,000.00	
Length	3.00	
Diversion Rate	1,270.00	
Flow Index	1.31	
Under Ideal Conditions, Flow Index should be between 0.83 and 2.7		

Adjusted Density Index if the Facility was a Standard Facility is as follows: Adjusted Density Index = (Actual Density Index X Standard Exchange of 2.5 per Hour)/ Actual Exchanges per Hours=.		
Actual Density Index	1.06	
Actual Exchanges Per Hour	0.65	
Adjusted Density Index	4.09	
If the Adjusted Density Index is between 0.4 and 1 then the density Index was Lowered to handle a lower diversion rate, so the annual volume should equal diversion capacity.		

<---- Use This Volume if Adjusted Density Index falls Within
Standards.