Natl Fish Hatchery data 7/14/2004

Attachment to Main Spring - Hagerman National Fish Hatchery

The diversions reported in the attached table are diverted under Water Right Nos. 36-00132 and 36-15448. Flow rates from eight measuring devices are used to compute the total diversion rate. Measuring device #1 (USFWS Site No. 423003) is a 48" concrete Parshall flume. Measuring device #2 (USFWS Site No. 423015) is an in-line propeller meter. Measuring device #3 (USFWS Site No. 423017) is an in-line ultrasonic meter. Measuring device #4 (USFWS Site No. 423018) is an in-line ultrasonic meter. Measuring device #5 (USFWS Site No. 423019) is an in-line turbine meter. Measuring device #6 (USFWS Site No. 544104) is a 6" Montana flume. Measuring device #7 (USFWS Site No. 423001) is an instantaneous measurement with a Marsh-McBirney current meter. The section for this measurement is a rectangular concrete channel. Measuring device #8 (USFWS Site No. 423002) is a 90 degree V-notch weir. The total diversion rate is computed by adding the measurements from the flumes, propeller meter, ultrasonic meters, and turbine meter and then subtracting the measurements from the V-notch weir and the current meter.

1 + 2 + 3 + 4 + 5 + 6 - 7 - 8 = Main Spring

1 - 410053 - Main Spring
2 - 410055 - Spring 13 (part)
3 - ~~none - Spring 11 overflow~~ 410051 - Spring 11 (part or alternate?) data not provided
4 - No WMIS ID - Hatchery 2
5 - 410055 - Spring 13 (part)
6 - 410051 - Spring 11
7 - 410025 - Spring 16
8 - 410057 - Spring 15

Main Spring + Spring 11 + Spring 13 + Hatchery 2 - Spring 15 - Spring 16
(12 & 14 included) (36-15449, 36-15450 sep. WR)

Main + Springs 11-14
36-132, 36-15448A, 36-15448B
36-8354

7/14/2004 Main Spring = 24.8 + 0.46 + 1.04 + 2.25 - 1.15 - 6.95 = 20.45

Len Lewis Spring 16 4100

RATING NUMBER: 4 Pt rectangular Weir Checked by:

DATE (1)	TIME (2)	GAGE HEIGHT (3)	(4)	(5)	DISCHARGE (cfs or gpm) (6)	REMARKS (7)	OBS. INIT. (8)
6-9	10:10				6.72		LB
6-16	8:50				7.03		LB
6-24	9:00			8.14	~~8.95~~		MO
6-30	8:23				7.14		E.W.
7-8	10:45				7.49		E.W.
7-14	9:00				6.95		MO
	weekly current meter measurement						

[redacted]

36A20030001
Spring 9

SITE NAME: Old Wet Lab Weir

SITE NUMBER: 544102

TYPE AND SIZE OF STRUCTURE: 1

RATING NUMBER:

DATE (1)	TIME (2)	H_A GAGE HEIGHT (3)	H_B GAGE HEIGHT (4)	DISCHARGE (cfs) or gpm (5)	REMARKS (6)
6-9	10:03	10.9		0.90	
6-16	9:15	11.0		0.90	
6-24	9:16	11.0		0.90	
6-30	8:41	11.0		0.90	
7-8	10:08	11.0		0.90	
7-14	9:15	11.0		0.90	

90° V-notch weir

4/0024

SITE NAME: Bickle Lake

SITE NUMBER: 423011

TYPE AND SIZE OF STRUCTURE: 15

RATING NUMBER:

DATE (1)	TIME (2)	GAGE HEIGHT (3)	(4)	(5)	DISCHARGE (cfs or gpm) (6)	REMARKS (7)
6/9	9:00	0.44			14.74	
6/16	7:34	0.44			14.74	
6-24	9:56	0.44			14.74	
6-30	8:51	0.44			14.74	
7-8	10:54	0.44			14.74	
7-14	9:27	0.44			14.74	

15 ft Cippoletti weir

410049

SITE NAME: Riley Lake

SITE NUMBER: 423008

TYPE AND SIZE OF STRUCTURE: 7

RATING NUMBER:

DATE (1)	TIME (2)	GAGE HEIGHT (3)	(4)	(5)	DISCHARGE (cfs or gpm) (6)	REMARKS (7)
6/01	9:04	0.34			4.67	
6/15	7:36	0.34			4.67	
6-24	9:54	0.34			4.67	
6-30	8:54	0.34			4.67	
7-8	10:57	0.34			4.67	
7-14	9:25	0.35			4.99	

7 ft Cippoletti weir

410050

SITE NAME: Tunison Lab Rcwy's

SITE NUMBER: 544101

TYPE AND SIZE OF STRUCTURE: 1

RATING NUMBER:

DATE (1)	TIME (2)	GAGE HEIGHT (3)	(4)	(5)	DISCHARGE (cfs) or gpm (6)	REMARKS (7)
6-9	10:03	0.40			1.47	
6-16	9:05	0.40			1.47	
6-24	9:15	0.42			1.58	
6-30	8:42	0.38			1.37	
7-8	10:06	0.38			1.37	
7-14	9:12	0.42			1.58	

$1.58 = 3.33\left(L - 0.2(0.42)\right)(0.42)^{1.5}$

$1.74 = L - 0.084$

$1.82 = L$

1.82 ft contracted rectangular weir

410051
rpt w/main spring

SITE NAME: Spring 11 Parshall Flume (6-inch)
SITE NUMBER: 544104

DATE (1)	TIME (2)	H_A GAGE HEIGHT (3)	H_B GAGE HEIGHT (4)	DISCHARGE (cfs or gpm) (5)
6-9	8:21		[illegible]	1.24
6-16	9:02		0.65	1.04
6-21	9:07		0.70	1.17
6-30	8:33		0.66	1.07
7-8	9:58		0.66	1.07
7-14	9:10		[illegible]	1.07 MD

410052

SITE NAME: Spring 8 Ultrasonic

SITE NUMBER: 423016

DATE (1)	TIME (2)	DIAL VOLUME (ft³ or gal) (3)	TIME FOR VOLUME (sec or min) (4)	FLOW RATE (cfs or gpm) (5)	TOTALIZER READING (ft³, gal, ac-ft) (6)	VOLUME SINCE LAST READING (ft³, gal, ac-ft) (7)
6-9	[illegible]			[illegible]		
6-[illegible]	[illegible]			0.54		
6-24	9:18			0.55		
6-30	8:44			0.54		
7-8	10:05			0.56		
7-[illegible]	[illegible]			[illegible]		
7-14	9:18			0.52		

410053

SITE NAME: Main Spring 4ft Parshall Flume

SITE NUMBER: 423003

DATE (1)	TIME (2)	H_A GAGE HEIGHT (3)	H_B GAGE HEIGHT (4)	DISCHARGE (cfs or gpm) (5)
6/9	9:11		1.32	24.795
6-16	8:07		1.32	23.620
6-21	7:59		1.32	24.795
6-30	9:12		1.28	23.62
7-8	11:12		1.32	24.795
7-14	10:26		1.32	24.795

410055 (a)
rpt w/main spring

SITE NAME: Spring 13 In-line Propeller Meter
SITE NUMBER: 423015

DATE (1)	TIME (2)	DIAL VOLUME (ft^3 or gal) (3)	TIME FOR VOLUME (sec or min) (4)	FLOW RATE (cfs or gpm) (5)	TOTALIZER READING (ft^3, gal, ac-ft) (6)	VOLUME SINCE LAST READING (ft^3, gal, ac-ft) (7)
[illegible]					[illegible]	[illegible]
[illegible]	[illegible]				[illegible]	2.938
6-26	10:00				215.178	5.314
6-30	9:14				218.415	3.237
7-8	11:14				222.517	4.102
7-14	10:29				227.263	4.746

$4.746\ AF \times \frac{43560\ ft^2}{ac} = 206{,}700\ ft^3$

7-8 11:14 AM to 7-14 10:29 AM

$= 5\ days + 23hr + 15min$

$= 432{,}000 + 82{,}800 + 900$

$= 515{,}700\ sec$

$\frac{206{,}700}{515{,}700} = 0.40\ cfs$

410055 (b)

rpt w/ main spring

7-8 11:10AM to 7-14 10:31AM

= 5 days + 23hr + 15min

= 515,700 sec

$\frac{29051}{515700} = 0.056$ cfs

SITE NAME: Spring 13 Turbine Meter

SITE NUMBER: 463019

DATE (1)	TIME (2)	DIAL VOLUME (ft³ or gal) (3)	TIME FOR VOLUME (sec or min) (4)	FLOW RATE (cfs or gpm) (5)	TOTALIZER READING (ft³, gal, ac-ft) (6)	VOLUME SINCE LAST READING (ft³, gal, ac-ft) (7)
[illegible]	[illegible]				[illegible]	193201
[illegible]	[illegible]				[illegible]	7822
6-21	10:01				22347611	28091
6-30	9:16				22376155	28544
7-8	11:16				22413499	37344
7-14	10:31				22447550	29051

NO WMIS ID

Per site plan - appears to be part of water from Spring 13/14/15 that is not ~~diverted to Brattain Ditch or~~ overflowed to ~~main Spring.~~ collection pond. ~~Does not appear to be measured~~ ~~data for WMIS.~~ Part of the water has already been measured @ USFWS 423002 /WMIS 410057.

SITE NAME: Hatchery 2 ultrasonic

SITE NUMBER: 423018

DATE (1)	TIME (2)	DIAL VOLUME (ft³ or gal) (3)	TIME FOR VOLUME (sec or min) (4)	FLOW RATE (cfs or gpm) (5)	TOTALIZER READING (ft³, gal, ac-ft) (6)	VOLUME SINCE LAST READING (ft³, gal, ac-ft) (7)
10/1						
5/19	11:07	~~4.34~~		~~0.36~~		
5/19	10:19			0.42		
5/26	9:59			0.97		
6/3	8:36			1.38		
6/9	9:07			1.77		
6-	-			1.95		
6-24	11:41			2.02		
6-30	9:20			2.24		
7-8	9:09			2.28		
7-14	9:35			2.25		

410058 (a)

SITE NAME: Spring 17 Ultrasonic Meter

SITE NUMBER: 423004

DATE (1)	TIME (2)	DIAL VOLUME (ft³ or gal) (3)	TIME FOR VOLUME (sec or min) (4)	FLOW RATE (cfs or gpm) (5)	TOTALIZER READING (ft³, gal, ac-ft) (6)	VOLUME SINCE LAST READING (ft³, gal, ac-ft) (7)
10/1/03	11:57			2.34		
10/9/03	10:38			2.30		
10/15/03	10:50			2.34		
10/21				—		
2/27						
03/03	8:43			2.87		
3/10	[illegible]			2.89		
3/18	10:37			2.84		
3/23	11:20			2.78		
	[illegible]			[illegible]		
4/8	11:19			2.70		
4/1	10:22			2.71		
4/21	14:43		[illegible]	2.71		
4/[illegible]	[illegible]			2.70		
5/5	11:30			2.69		
5/13	[illegible]			2.71		
5/19	10:29			2.70		
[illegible]	[illegible]					
6-24	10:15			2.61		
6-30	9:25			2.36		
7-8	9:05			2.37		
[illegible]	[illegible]			[illegible]		
7-14	11:10			2.81		

410058 (b)

SITE NAME: Spring 17 weir

SITE NUMBER: 423021

TYPE AND SIZE OF STRUCTURE: 9

RATING NUMBER:

DATE (1)	TIME (2)	GAGE HEIGHT (3)	(4)	(5)	DISCHARGE (cfs or gpm) (6)	REMARKS (7)
10/1						Water is being Read by
10/21	10:55	1.10			3.154	
10/29	11:22	1.10			3.154	Water is now going to
11/5	10:37	1.09			3.083	we will Read from
11-12	11:41	1.09			3.083	We Live up the tr
11-20	11:31	1.09			3.083	
11-25	11:47	1.08			3.014	
12-3	11:46	1.08			3.014	
12-10	9:13	1.08			3.014	
12-17	9:23	1.08			3.014	
12-24	10:20	1.08			3.014	
12-31	9:22	1.08			3.014	
1-7-04	10:06	1.08			3.014	
1-14-04	12:55	1.07			2.945	
1-22	10:39	1.07			2.945	
1-28					2.945	
2/3	8:46	1.07			2.945	
2/11	10:49	1.07			2.945	
2/19	10:46	1.07			2.945	
2/25	10:21	1.06			2.877	
3/3						- Water is now Run
						front rcwy's will be
						Green Hook
5/26	10:10	1.06			2.877	- front rcwy's are
6/3	8:52	1.06			2.877	Water is running
6/9	9:20	1.06			2.877	in's rise reek
6-16	6:34	1.06			2.877	
						Trout rcwy back on 1
						reading in ultrasonic bo

90° V-notch weir

NA

SITE NAME: Domestic Well Meter

SITE NUMBER: 423020

DATE (1)	TIME (2)	DIAL VOLUME (ft^3 or gal) (3)	TIME FOR VOLUME (sec or min) (4)	FLOW RATE (cfs or gpm) (5)	TOTALIZER READING (ft^3, (gal), ac-ft) (6)	VOLUME SINCE LAST READING (ft^3, (gal), ac-ft) (7)
6-9	10:35				4947120	7870
[illegible]	[illegible]				4947870	7950
6-21	:18				4955030	6050
6-30	10:16				4961960	6930
7-8	11:36				4970160	8200
7-19	10:41				4977590	7430

90° V-notch weir

DATE (1)	TIME (2)	GAGE HEIGHT (3)	(4)	(5)	DISCHARGE (CFS or gpm) (6)
6/3	8:00	1.16			3.598
6/9	10:20	1.16			3.598
6-16	9:00	1.16			3.598
6-24	9:05	1.16			3.598
6-30	8:30	1.16			3.598
7-8	9:56	1.16			3.598
7-19	9:02	1.15			3.502

90° V-notch weir

REMARKS (7)	OBS. INIT. (8)
	E.W.
	JB
	JB
	MO
	E.W.
	E.W.
	MO

This flow is remeasured at either "Hatchery 2", "Main Spring", or Brailsford Ditch