

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 98-7913
Exam Date: 07/12/2017

1. Current Owner:
KOOTENAI TRIBE OF IDAHO PO BOX 1269 BONNERS FERRY ID 83805-1269
2. Accompanied by: Chris Chaney
Phone No: 208-267-3620
Address: Same as above
Relationship to permit Holder: Representative, Facility Engineer

3. SOURCE:
KOOTENAI RIVER
MOYIE RIVER
GROUND WATER

Tributary
COLUMBIA RIVER
KOOTENAI RIVER

Method of Determination: Arcmap and DRG.

B. OVERLAP REVIEW

1. Other water rights with the same place of use: YES Overlap

Water Right No.	Source	Purpose of Use	Basis
98-7670	GROUNDWATER	COMMERCIAL	LICENSE
98-7671	MOYIE RIVER	RECREATION STORAGE	LICENSE
98-7804	SKIN CREEK	MUNICIPAL	LICENSE
98-8041	GROUNDWATER	DOMESTIC	Permit In process licensing, split from this WR.

Comments: Rights 98-7670 & 98-7671 use different PODs than this water right, and water use is related to an RV park co-located with this right's fish hatchery water use, but separate and not a concern for overlap. Right 98-7804 is a municipal water right which overlaps this right's POU, but the fish propagation and hatchery operation are not service connected to the municipal system and there is no concern for overlap. Right 98-8041 has been split from this right, and accounts for domestic use within the hatchery and for two homes co-located with the hatchery; the groundwater source is a separate well, and there is no mixing of water between the two systems for 98-7913 & 98-8041 thus no concern for overlap.

2. Other water rights with the same point-of-diversion: NO Overlap

C. DIVERSION AND DELIVERY SYSTEM**1. LOCATION OF POINT(S) OF DIVERSION:**

KOOTENAI RIVER L2 (NW¼ NE¼), Sec. 22, Twp 62N, Rge 02E, B.M. BOUNDARY County
MOYIE RIVER NW¼ SE¼, Sec. 15, Twp 62N, Rge 02E, B.M. BOUNDARY County
GROUND WATER SW¼ SE¼, Sec. 15, Twp 62N, Rge 02E, B.M. BOUNDARY County
GROUND WATER SW¼ SE¼, Sec. 15, Twp 62N, Rge 02E, B.M. BOUNDARY County

Method of Determination: GPS. POD(s) located as follows:

- Kootenai River POD -116°11.163, 48°42.926
- Moyie River POD -116°11.041, 48°43.345
- Groundwater Hatchery Well (HW2) -116°11.173, 48°43.204 D0058065
- Groundwater Hatchery Well (HW3) -116°11.169, 48°43.213 D0058099

PLACE OF USE: FISH PROPAGATION

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
62N	02E	15														X	X		

Method of Determination: Field examination and Arcmap aerial imagery.

3.

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

☒ Indicate weir size/pipe as applicable.

Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.

☒

Aerial Photo Attached (required for irrigation of 10+ acres).

☒

Photo of Diversion and System Attached

☒

4.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
KOOTENAI RIVER (INTAKE)		3EA 5			
MOYIE RIVER (INTAKE)		3EA 7.5			
HW2 – D0058065		10			
HW3 – D0058099		10			

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
FLOW METER(S)						

2. Measurements: Flow measurement readings were taken using the applicant's system installed flow meters & SCADA system panel. Each POD was operated individually, and the flow measurement recorded w/photographs taken.

E. FLOW CALCULATIONS

Measured Method: flowmeters as follows:

- Kootenai River POD – 3ea 5 hp pump(s), SCADA system reading = 1,299 gpm or 2.89 cfs
- Moyie River POD – 3ea 7.5 hp pump(s), SCADA system reading = 16,645 gpm or 3.67 cfs
- HW2 well D0058065 POD – 10 hp pump(s), SCADA system reading = 332.5 gpm or 0.74 cfs
- HW3 well D0058099 POD – 10 hp pump, SCADA system reading = 333.47 gpm or 0.74 cfs.

Normal hatchery operations utilize 1 surface source and up to 2 groundwater sources at any given time, switching surface sources and/or groundwater to achieve temperature ratings. The largest total diversion rate used under normal operations equals 3.67 cfs (Moyie river) + 0.74 cfs (HW2 well) + 0.74 cfs (HW3 well) = 5.15 cfs. Typically, the 2 wells are operated lead/lag and not simultaneously, but it is permissible and has occurred in the past.

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation: N/A

2. Volume Calculations for Other Uses:

Fish Propagation annual volume for year 2016 =

- 93,600,000 gal (Moyie River) + 102,170,000 gal (Kootenai River) + 11,770,000 gal (HW2 & HW3 groundwater) = 207,540,000 gal or 636.9 af = **637 af** considering department rounding standards.

G. NARRATIVE/REMARKS/COMMENTS

Admin note: the irrigation and domestic use were split and are accounted for under WR 98-8041. Parent right 98-7913 shall account for the fish propagation water use associated with Twin River Fish Hatchery. This was done as the GW well source for the domestic and irrigation being separate along with a separate water system than the fish propagation water system.

A field examination was conducted by department staff on 7/12/2017 accompanied by the hatchery manager at that time. Since the exam the hatchery manager has changed, and follow-up field exam & requests for information were handled by the hatchery's facility engineer Chris Chaney. At time of initial exam, water was shown being diverted from the Kootenai River, Moyie River, and 2ea groundwater sources supporting fish propagation at the Twin River Fish Hatchery. The applicant's water system incorporates flow meters on each source and uses a SCADA monitoring system which enables instantaneous flow rates to be captured as listed below:

- Kootenai River POD – 3ea 5 hp pump(s), SCADA system reading = 1,299 gpm or 2.89 cfs
- Moyie River POD – 3ea 7.5 hp pump(s), SCADA system reading = 16,645 gpm or 3.67 cfs
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Under normal circumstances one surface source and a groundwater source co-mingle and are used to fill the facilities head tanks, brood tanks, rearing tanks, and incubation tanks depending on fish type either sturgeon or burbot. The water source(s) and temperature are dependent on what stage the fish type is at in the hatchery process. All water used from the POD(s) related to the hatchery operation are non-consumptive and are routed to settling areas prior to release back into the Moyie River just upstream of the confluence of Moyie & Kootenai River(s).

The fish propagation POU consists of a main fish hatchery building which houses an assortment of tanks varying in size and shape. Mr. Chaney provided specifications by fish type for the number, size & volume of tanks utilized in the hatchery's operation by email on 3/31/2021 (enclosed). Fish propagation calculation sheets were developed during licensing review which include the facilities total volume = 24,483 gallons. Mr. Chaney and hatchery personnel provided tank turnover rates, which were compiled for reference to demonstrate what the facility currently operates at using an average turnover rate of 1 time per hour. The turnover rate is less than anticipated by IDWR standards, but these standards are focused on trout rearing data. The applicant rears sturgeon and burbot, which are bottom dwelling fish species that have reduced turnover requirements to maintain healthy rearing operations.

The fish propagation POU was traced out during licensing review using Arcmap aerial imagery and consists solely of the fish hatchery main building and co-located footprint. Water is piped in from each of the two surface sources that have individual pump stations, and water mixed in a common line with groundwater from the two hatchery production wells (HW2 & HW3). The annual volume for fish propagation was derived using SCADA system historical data. Mr. Chaney provided annual volume reports for years 2016-2020. Year 2020 was the largest volume year recorded and was selected for use recommending the annual volume for licensing purposes as follows: 93,600,000 gal (Moyie River) + 102,170,000 gal (Kootenai River) + 11,770,000 gal (HW2 & HW3 groundwater) = 207,540,000 gal or 636.9 af = **637 af** considering department rounding standards.

The annual volume derived using the facilities tank capacity total and turnover rates (1 per hr) demonstrate the need for 663.0 af of volume annually, which identifies the hatchery has not operated at its full capacity during the development period (based on data provided by the applicant). Email communication between department staff Nathan Jensen, Kootenai Tribe of Idaho Conservation Aquaculture Supervisor, show that the 1 turnover rate was an estimation versus a hardline requirement base on the complexities and stages of the hatchery's fish propagation process. Several pages of email communication between hatchery staff and the department provide adequate information to conclude the use of water by the applicant is beneficial in nature and I recommend approving the permit for licensing purposes.

Conditions 132, R66, 26A, 046, and WB9 were removed from the permit during licensing review. Conditions 122 and 027 were added to the permit describing the applicant shall not divert water at a rate exceeding what is reasonable... and that water use for fish propagation is non-consumptive. All other conditions on the permit shall be carried forward to licensing. Overlap concerns: Rights 98-7670 & 98-7671 use different PODs than this water right, and water use is related to an RV park co-located with this right's fish hatchery water use, but separate and not a concern for overlap. Right 98-7804 is a municipal water right which overlaps this right's POU, but the fish propagation and hatchery operation are not service connected to the municipal system and there is no concern for overlap. Right 98-8041 has been split from this right, and accounts for domestic use within the hatchery and for two homes co-located with the hatchery; the groundwater source is a separate well, and there is no mixing of water between the two systems for 98-7913 & 98-8041 thus no concern for overlap. There are no additional overlap concerns for this water right.

Have conditions of permit approval been met? X Yes No

H. RECOMMENDATIONS

1. Recommended Amounts

<u>Beneficial Use</u>	<u>Period of Use</u>	<u>Rate of Diversion</u>	<u>Annual Volume</u>
FISH PROPAGATION	01/01 to 12/31	3.85 CFS	637.0 AF

Totals: 3.85 CFS 637.0 AF

2. Recommended Amendments

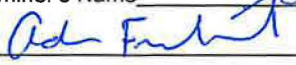
☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☒ None

☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☒ None

I. AUTHENTICATION

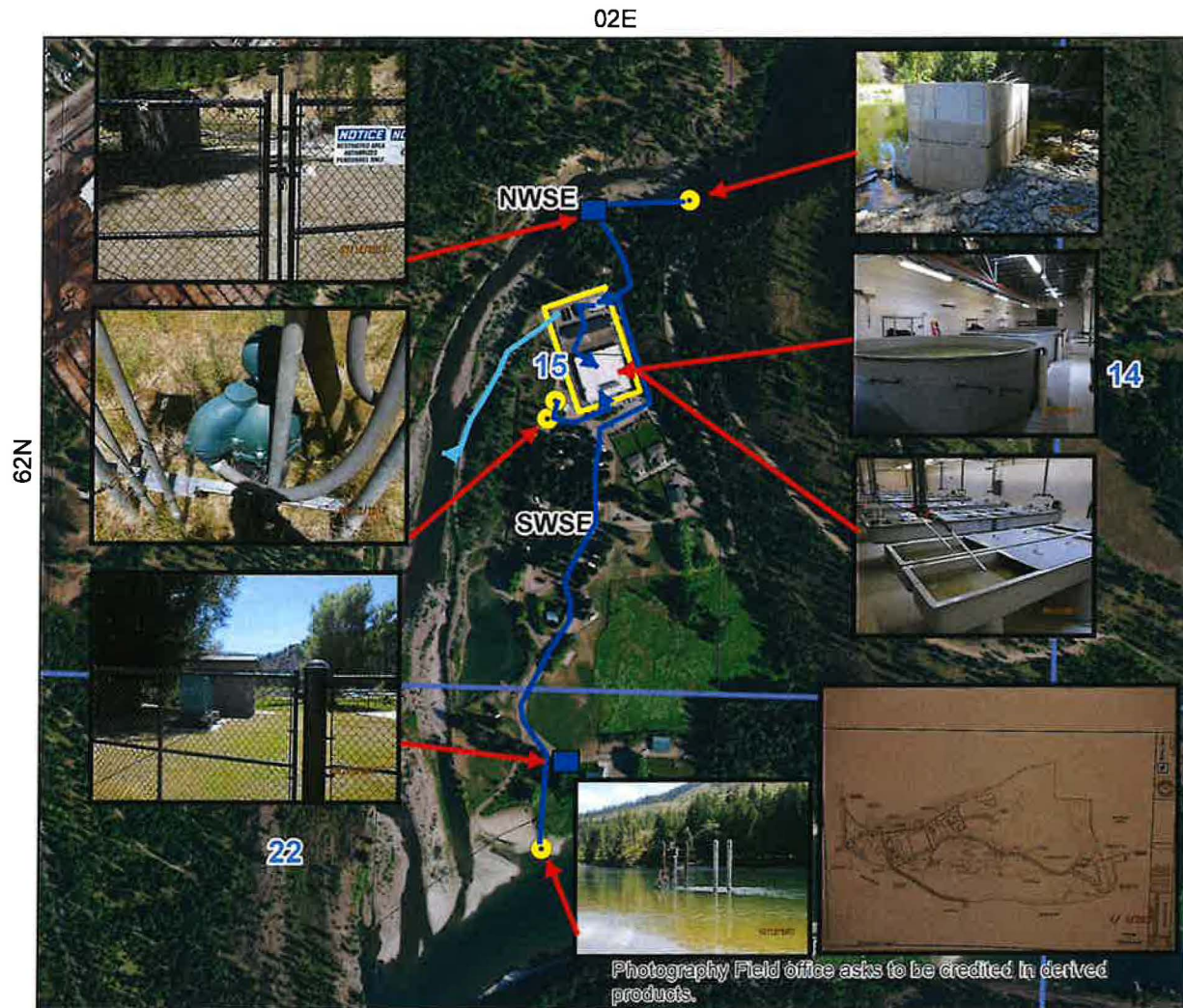
Luke Bates -

Field Examiner's Name  Date 2/9/2022

Reviewer  Date 2/11/2022

State of Idaho
Department of Water Resources
Attachment to Field Exam
98-7913

FISH PROPAGATION system diagram.



- Point of Diversion
- Place Of Use Boundary
- Townships
- PLS Sections
- Quarter Quarters

0 0.075 0.15 0.3 Miles



WR 98-7913 FISH PROPAGATION CALCULATION SHEET

FACILITY VOLUME DATA: Total tank usage for Sturgeon and Burbot based on email data received from the Fish Hatchery's Facility Engineer, Chris Chaney, on March 31, 2021; revised data by email on December 6, 2021.

FACILITY VOLUME TOTAL			
Tank Use	# tanks	Gal per tank	Gal per type
brood	6	5287	31722
incubation	36	239	8604
rearing	38	1504	57152
brood	12	2350	28200
rearing	52	846	43992
incubation	28	376	10528
head tanks	5	587	2935
Total Gal for tanks			183133

Facility volume (cubic feet) = 183,133 gal / 7.48 gal per cubic feet = **24,483 gal**

DETERMINING FACILITY EXCHANGE & DIVERSION CAPACITY CALCULATION: using Department fish propagation Excel Doc, water system maximum diversion rate, and facility volume.

Determination of facility exchange =	
Diversion Rate (CFS)	5.02
Facility Volume (Gal)	24,483.00
Exchanges per Hour	0.74

Diversion Capacity Calculation = Diversion Rate in cfs X 1.9835 X 356 days	
Diversion Rate (CFS)	5.02
Total Volume (AF)	3634.36705

Fish Hatchery operations use in tank aerators to increase oxygen levels; sturgeon & burbot are less active than trout, and by nature require less oxygen than trout during rearing stage of hatchery operations resulting in a reduced exchange per hour rates compared to trout.

ANNUAL VOLUME DATA DERIVED FROM FISH TANK(S) & HOURLY TURNOVER RATES: Calculated using email data received from the Fish Hatchery's Facility Engineer, Chris Chaney, on March 31, 2021 & April 5, 2021; revised data by email on December 6, 2021.

Annual Volume Data Req'd Using Fish Tank(s) & Tank Turnover Rates								
Corrected cells in RED	STURGEON							
	GPM	# of Tanks	MIN/HR	turnover per HR	HR/DAY	DAY/YEAR	Annual (GAL)	
	10	6	60	1	24	120	10368000	Brood Stock
	2	36	60	1	24	150	15552000	Incubation
	8	38	60	1	24	240	105062400	Rearing
# cones	BURBOT							
	GPM		MIN/HR	turnover per HR	HR/DAY	DAY/YEAR	Annual (GAL)	
	17.61	12	60	1	24	60	18258048	Brood Stock
1	0.066	168	60	1	24	90	1437004.8	Incubation
	9.68	52	60	1	24	90	65235456	Rearing
Total GAL							215912908.8	
STURGEON & BURBOT COMBINED TURNOVER VOLUME							662.6	

Email correspondence between Department staff and fish hatchery engineer, Chris Chaney, resulted in "corrected cells" highlighted in red from the original data submitted by the applicant. Total sturgeon & Burbot turnover volume = 215,912,908.8 gal / 325,850 gal per af = 662.5 af = **663.0 af** considering Department rounding standards.

ANNUAL VOLUME DATA DERIVED BY WATER SYSTEM SCADA MONITORING SYSTEM: Fish hatchery facility engineer, Chris Chaney, provided annual data volume for years 2016-2020 in an email received on April 26, 2021, which were captured by flowmeters installed on the system for each of the water sources.

SCADA Annual Volume Data YR2016			
Source	Gal (MG)	Gal	Acre-feet
Moyie	93.6	93600000	287.2
Kootenai	102.17	102170000	313.5
GW	11.77	11770000	36.1
	TOTAL	207540000	636.9

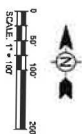
YR2016 was the largest consumption year on record for the fish hatchery's SCADA monitoring system.

RECEIVED
MAR 31 2021

DWR/NORTH

MOYIE RIVER

KOOTENAI
RIVER



J-C103

Sheet 13 of 283
Date: 03/25/2013

KOOTENAI TRIBE OF INDIANS
BORNEO FISHING CO.
KOOTENAI-STURGEON BURBOT HATCHERY
FISH CONSERVATION AQUACULTURE PROGRAM

CIVIL SITE PLAN

REV	DATE	DESCRIPTION	BY
A	03-09-12	30% SUBMITTAL	
B	12-31-12	40% PRICING SET	
C	02-01-13	90% SUBMITTAL	
D	03-13-13	95% SUBMITTAL	
E	05-07-13	FINAL PRICING	
F	05-28-13	100% PRICING SET	



TETRA TECH

www.tetratech.com
1420 Fifth Avenue, Suite 800
Seattle, WA 98101
Tel: 206.463.0430 Fax: 206.463.0301

6" VOLT - X MOTOR
WATER WELL SUBTROL

HP **10** V **230/460**

KW **7.5** PH **3** HZ **60**

DATE **13H19** 13 06048 A
CODE

QTY **1**

236 3128 120



S/N 13H19-13-06048A

X



Franklin Electric
www.franklin-electric.com

Product of USA



Franklin Electric
SUBMERSIBLE MOTOR

MODEL **2363128120**

3-PHASE

60Hz metric	8.6 kW	460 V	16.1 A	3480 min ⁻¹	cos φ 0.86
	(7.5 kW SF 1.15)	230V	32.2 A	3480 min ⁻¹	cos φ 0.86

60Hz SF 1.15	10 HP	460 V	14.2 A	3450 RPM	16.1 MAX A
		230V	28.4A	3450 RPM	32.2 MAX A

KVA Code H

Thrust Load 15500N 3500LB

Max Ambient Temp 30°C

Min Cooling Flow 16cm/s 0.5ft/sec

Ins Class F

IP68

Continuous Duty

PRODUCT OF USA

GROUND well HZ

with PAGE 3



Franklin Electric

FRANKLIN ELECTRIC
TURBINE PUMP TEST STAND

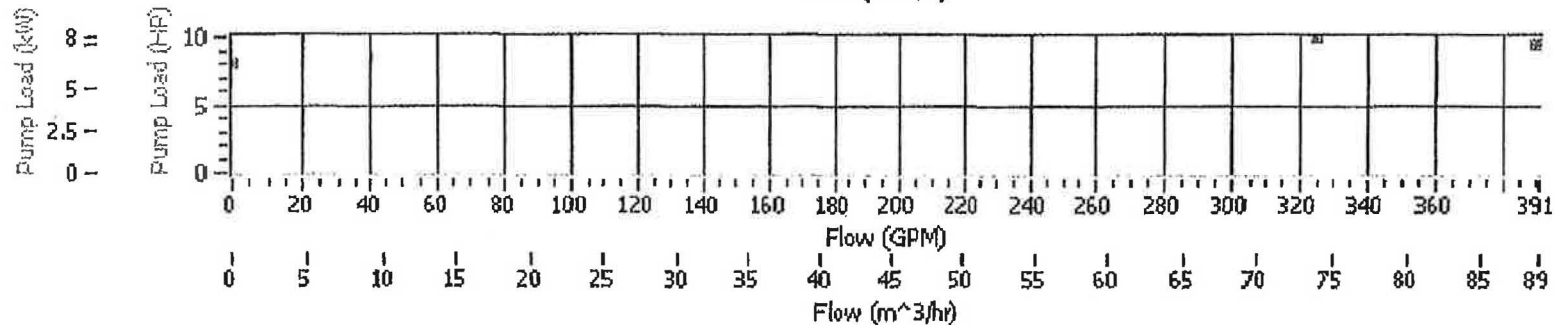
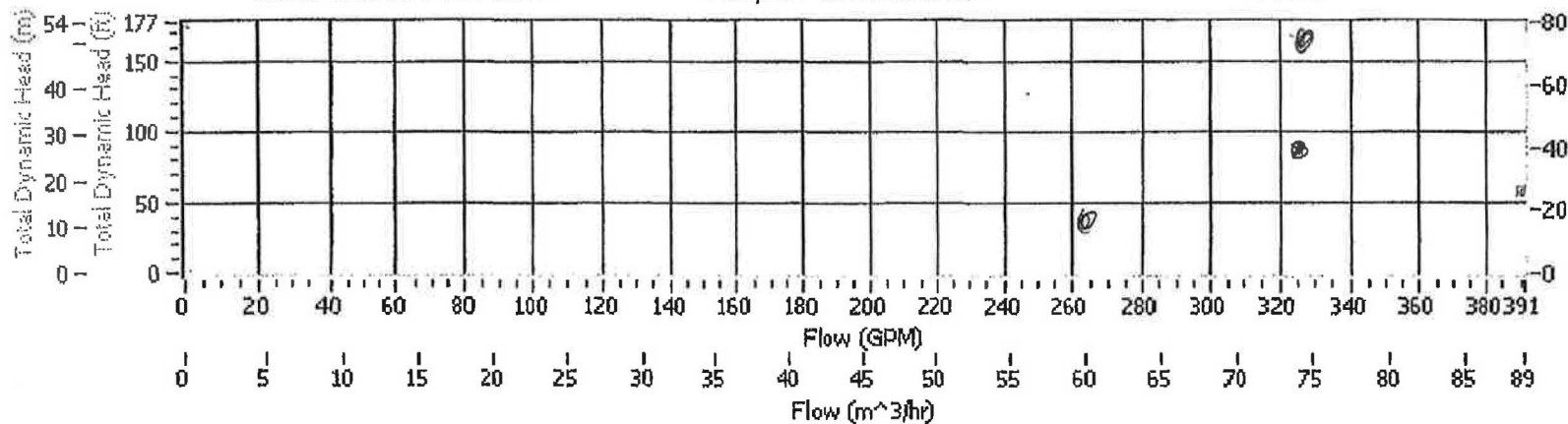
1301 W. Stovall Road
Willburton, OK 74578
(918) 465-2348

FINAL PRODUCTION TEST DATA

Model 325STS10D6B-0364

Pump SN 13H192005030P

Hz 60



This is production test data for the pump referenced above, tested on a calibrated motor.

This is not a certified curve, and Franklin Electric does not guarantee this performance under all conditions.

Tested By: Anthony C

Test Date: 8/19/2013 8:13 AM

Pump
Well
GROUND



MOD **325STS10D6B-0364**



SUBMERSIBLE TURBINE PUMP
3 STAGE, 6" MOTOR BRACKET, 4" DISCHARGE

DATE **13H19**
CODE **20 05030 P**

9706 0325 103



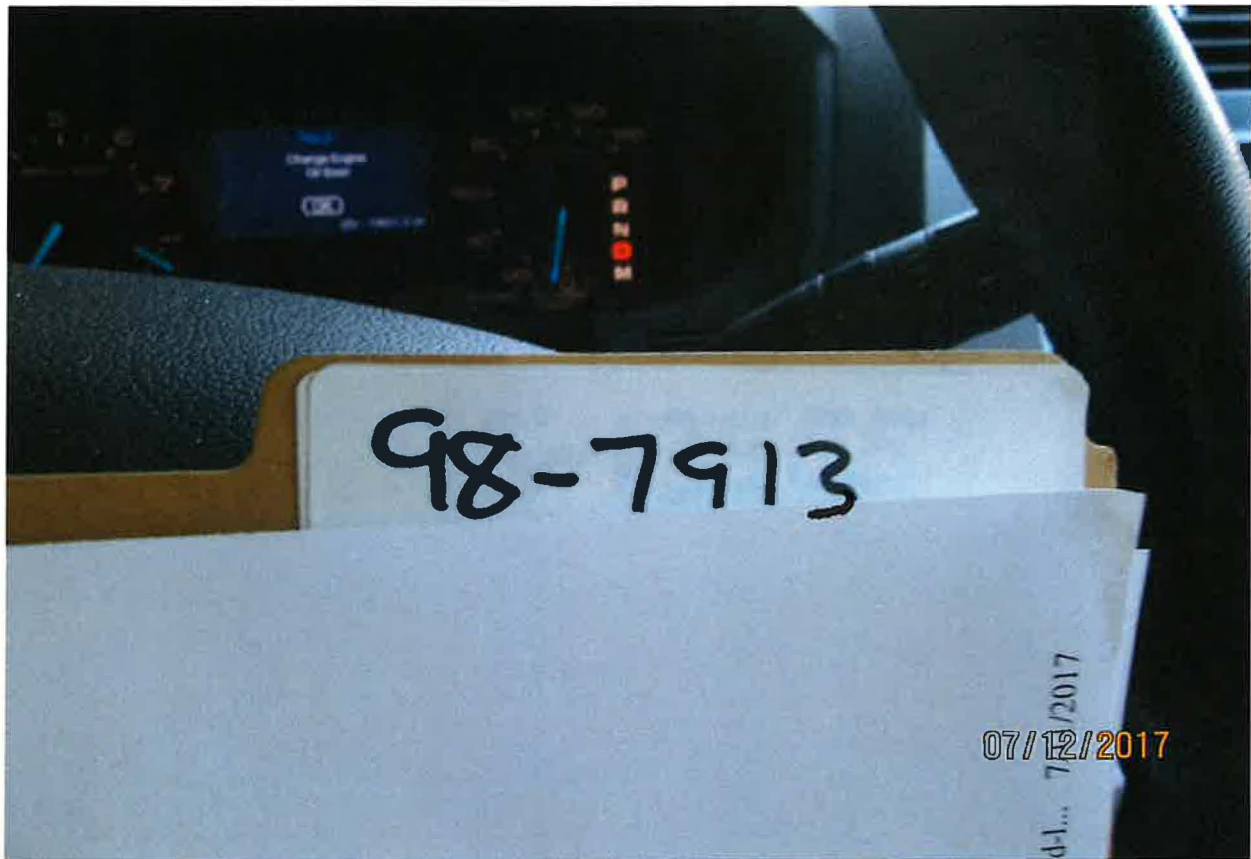
S/N 13H19-20-05030P



Franklin Electric

X

PRODUCT OF USA



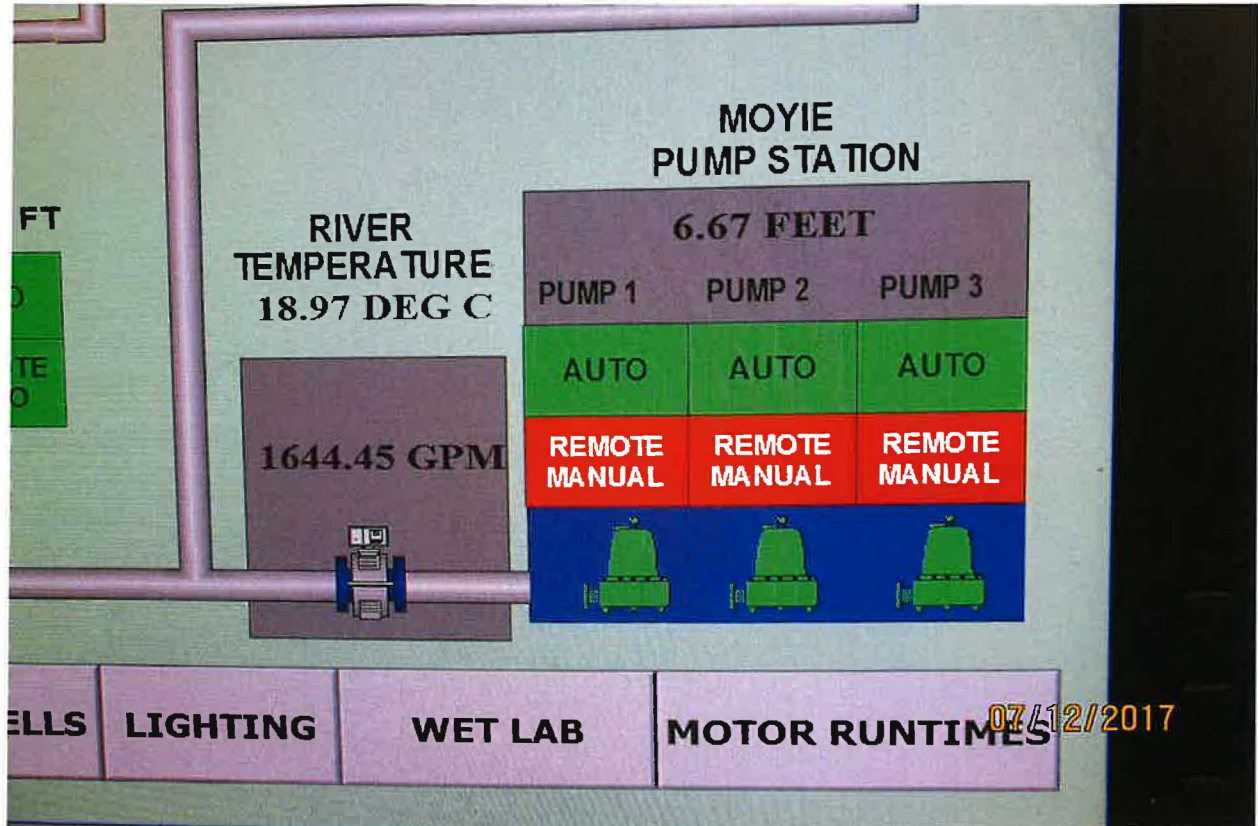
FIELD EXAM DATE – 7/12/2017



POD – MOYIE RIVER INTAKE WORKS



MOYIE RIVER CONVEYANCE SYSTEM PUMP STATION



MOYIE RIVER PUMP STATION – FLOW RATE = 1,645 GPM



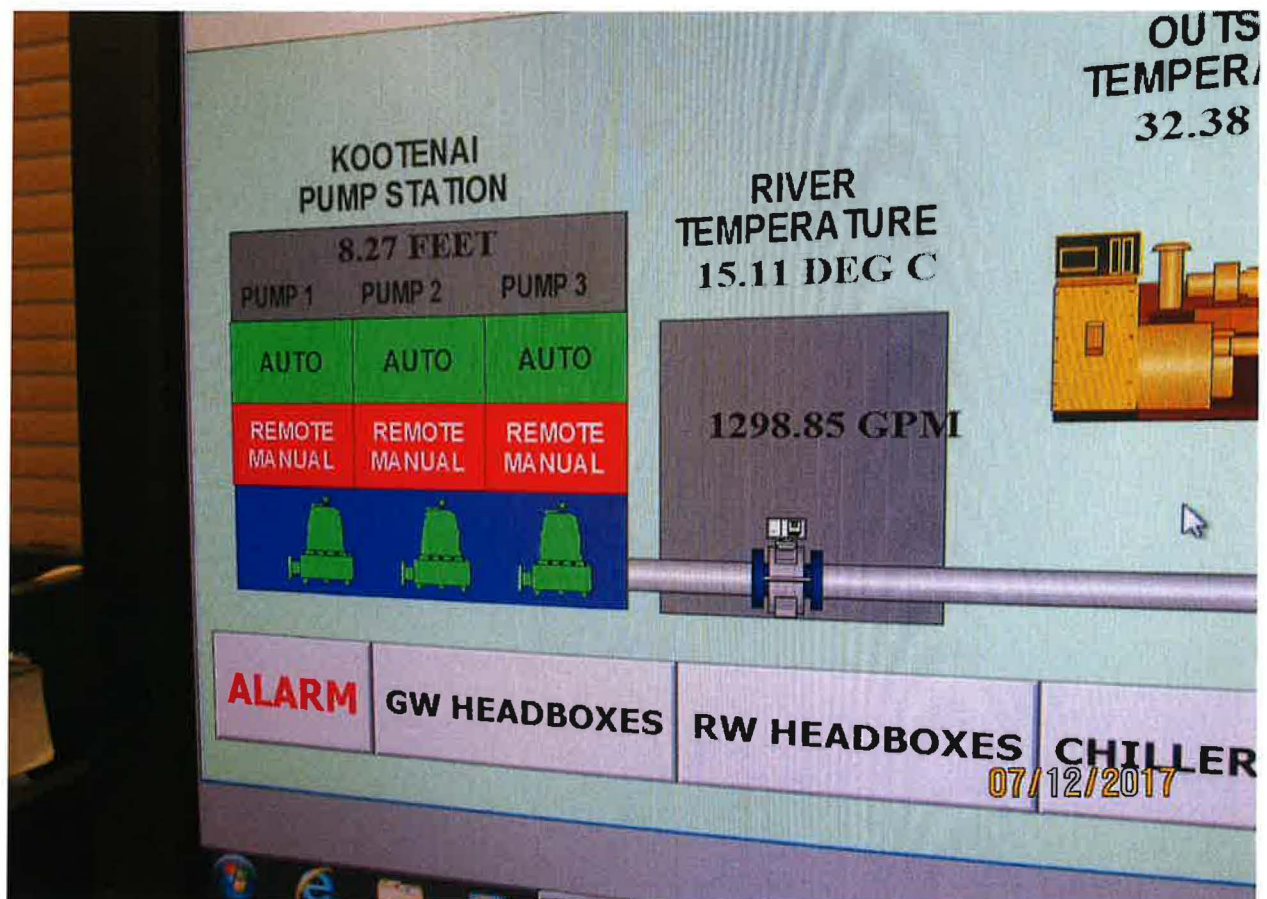
POD – KOOTENAI RIVER INTAKE WORKS



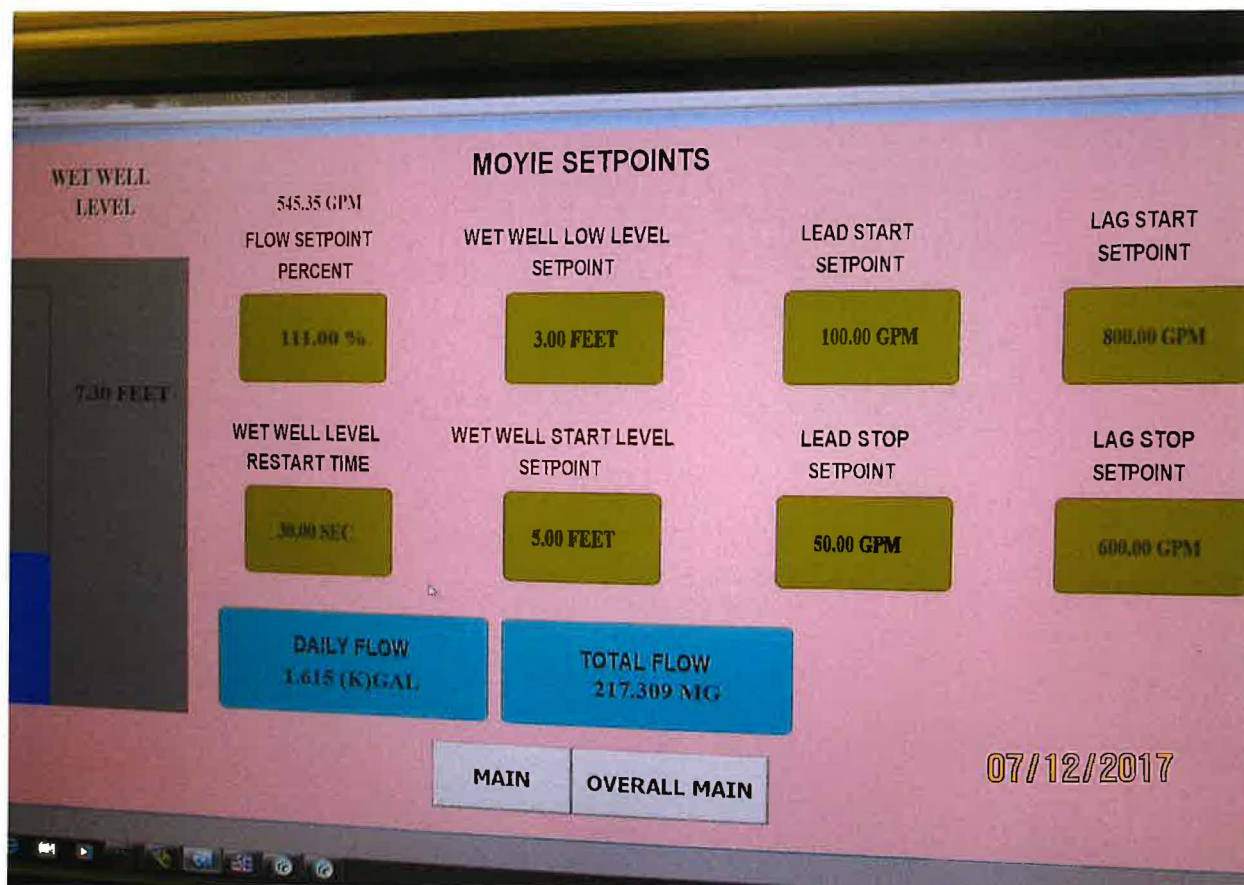
KOOTENAI RIVER CONVEYANCE SYSTEM PUMP STATION



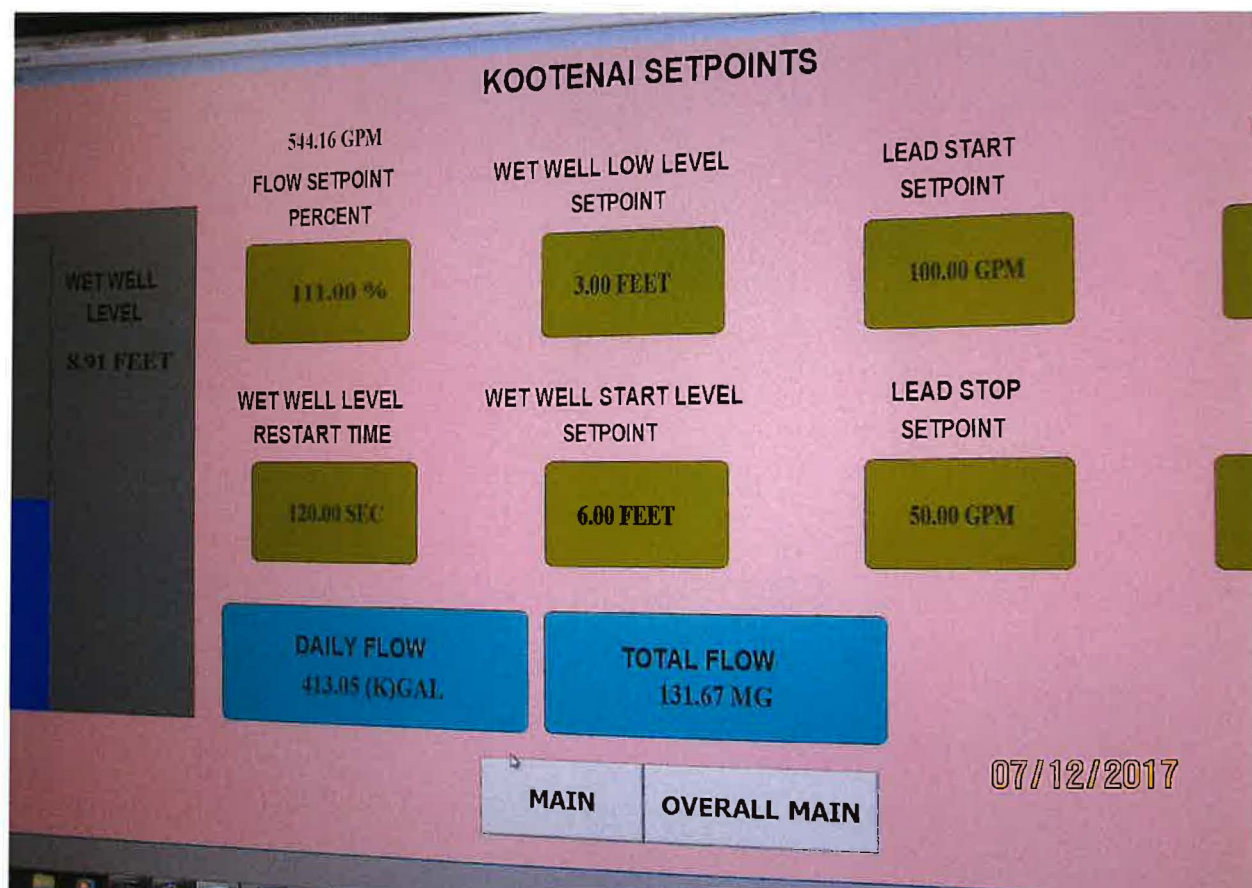
KOOTENAI RIVER CONVEYANCE SYSTEM PUMP STATION PIPE VAULT(S)



KOOTENAI RIVER PUMP STATION – FLOW RATE =1,299 GPM



HATCHERY SCADA SYSTEM – MOYIE SETPOINTS

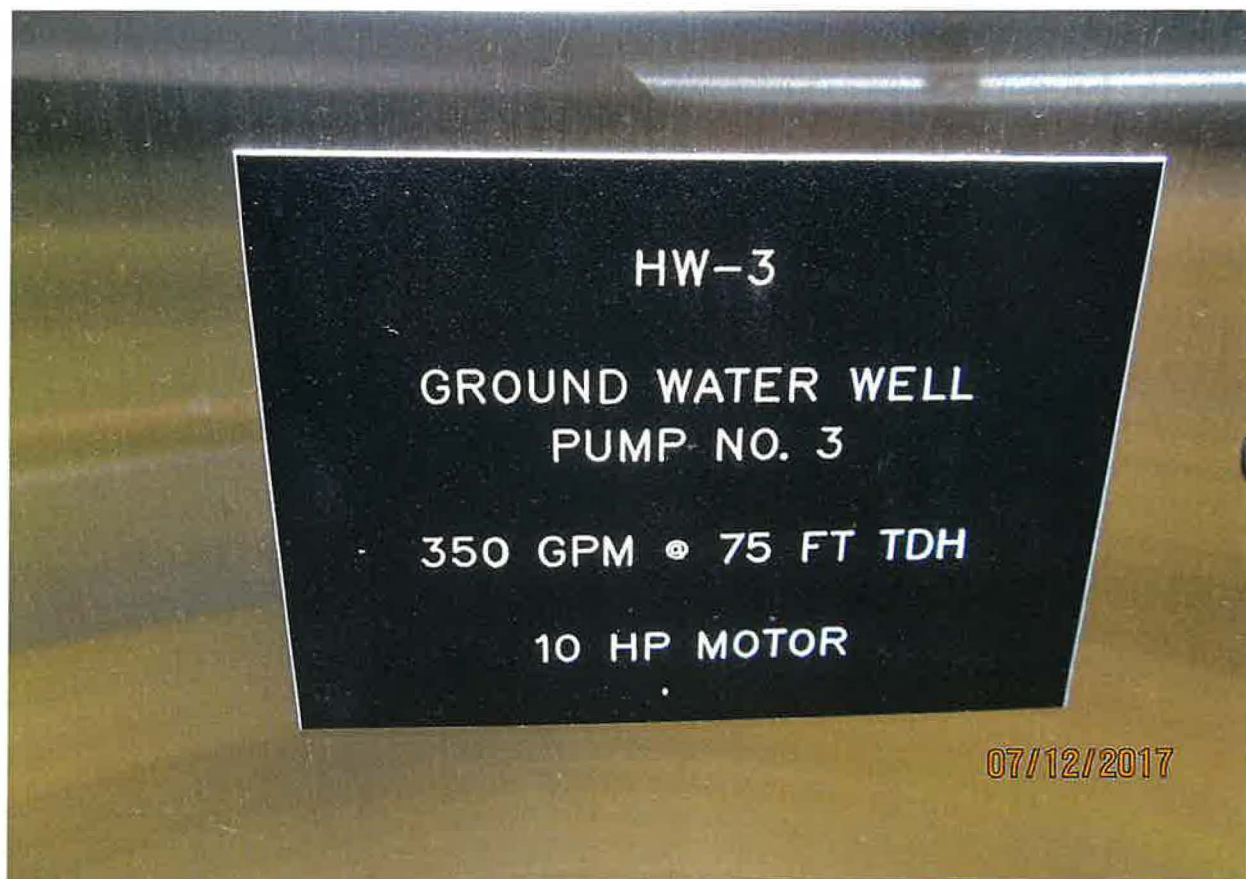


HATCHERY SCADA SYSTEM – KOOTENAI SETPOINTS

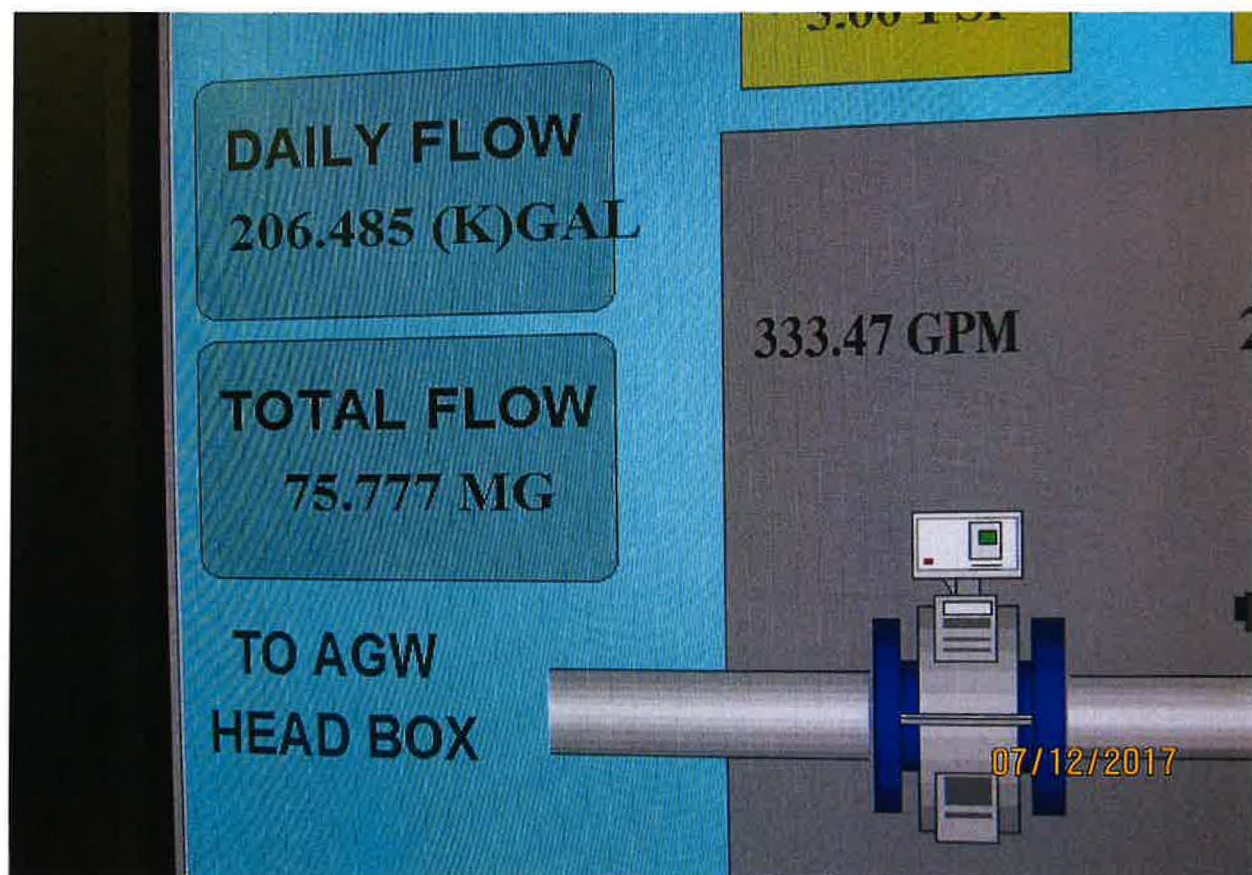


POD – WELL D0058099 (HW3)





POD – D0058099 – (HW3) 10 HP MOTOR INSTALLED



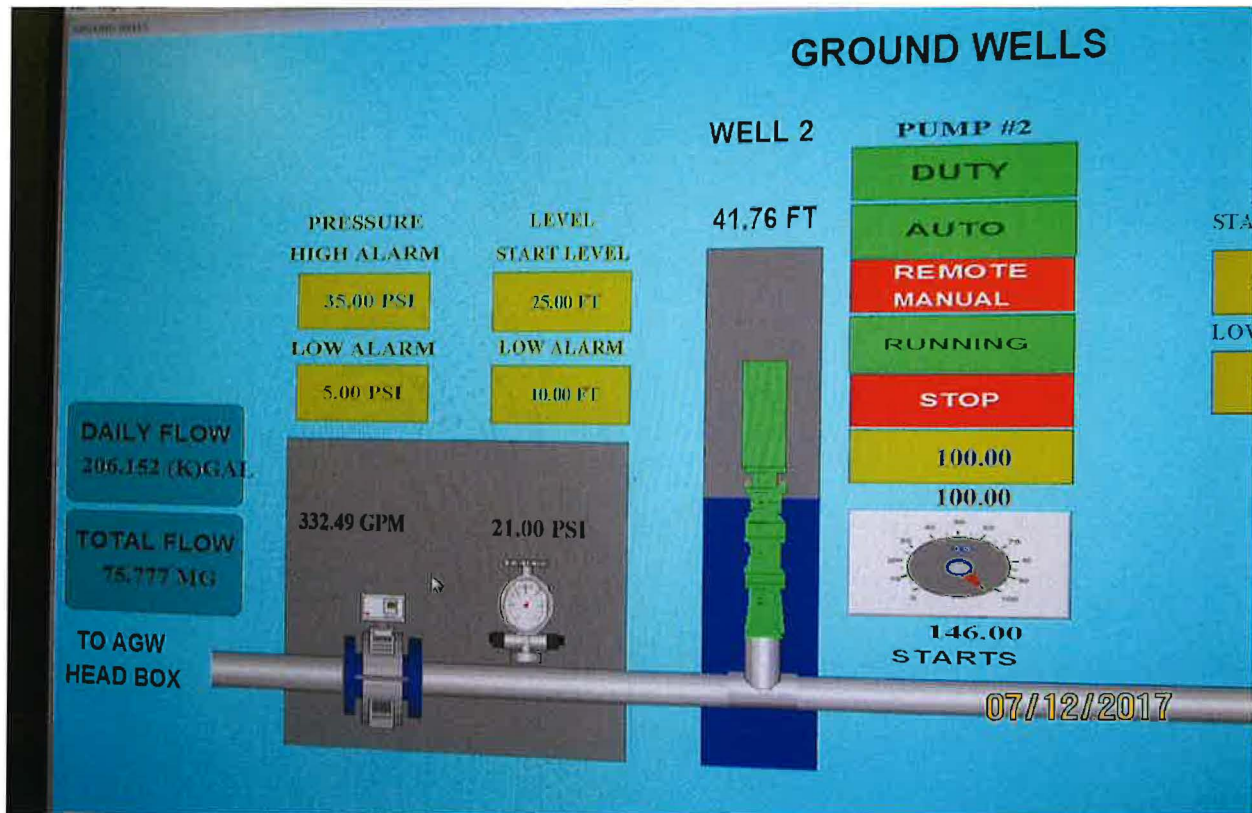
D0058099 (HW3) FLOW RATE = 333.5 GPM



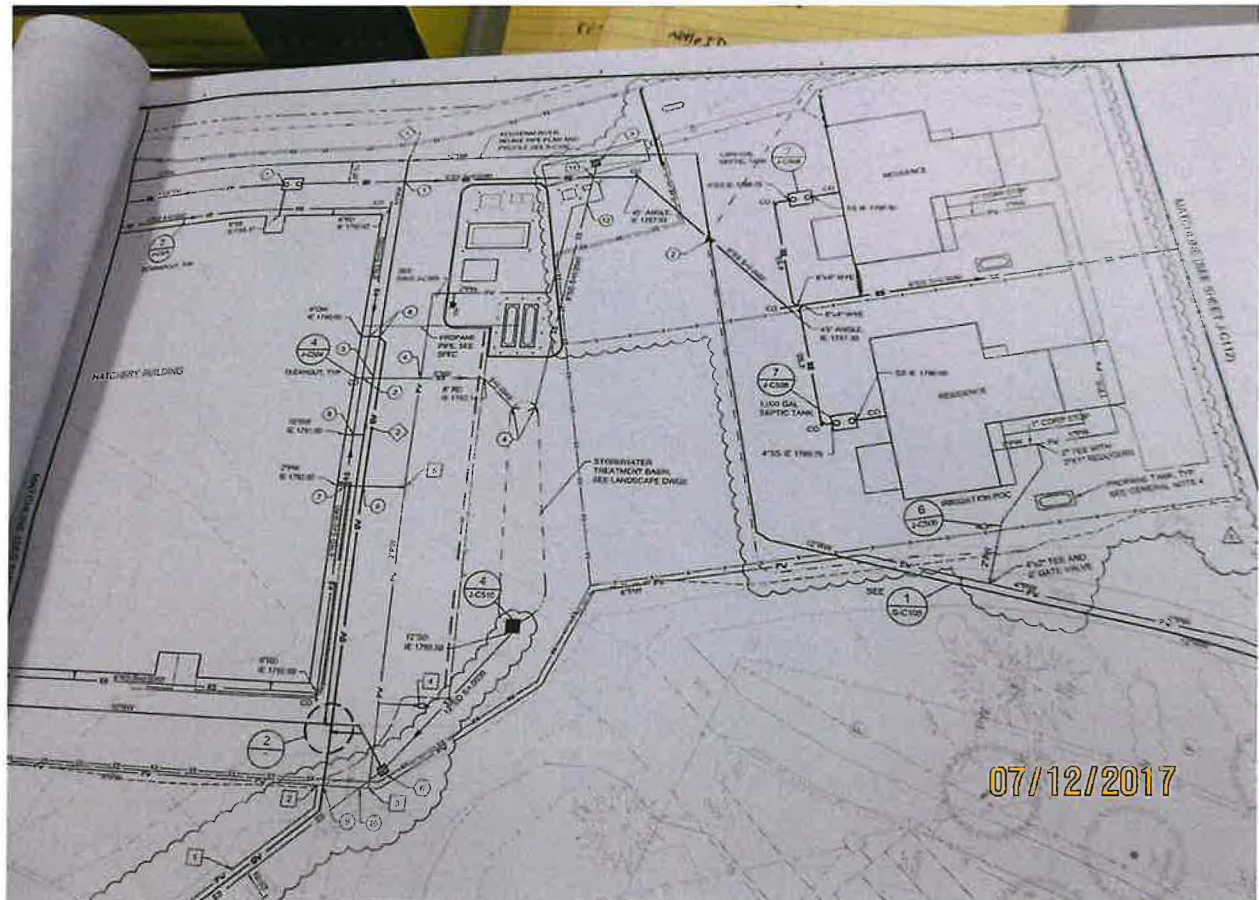
POD – WELL D0058065 (HW2)



POD – D0058065 – 10 HP MOTOR INSTALLED



D0058065 (HW2) FLOW RATE = 332.5 GPM



FISH HATCHERY SCHEMATIC – KOOTENAI RIVER PIPE PLAN AND PROFILE



FISH PROPAGATION POU - HATCHERY OPERATIONS FOR STURGEON & BURBOT





FISH PROPAGATION POU - HATCHERY OPERATIONS FOR STURGEON & BURBOT





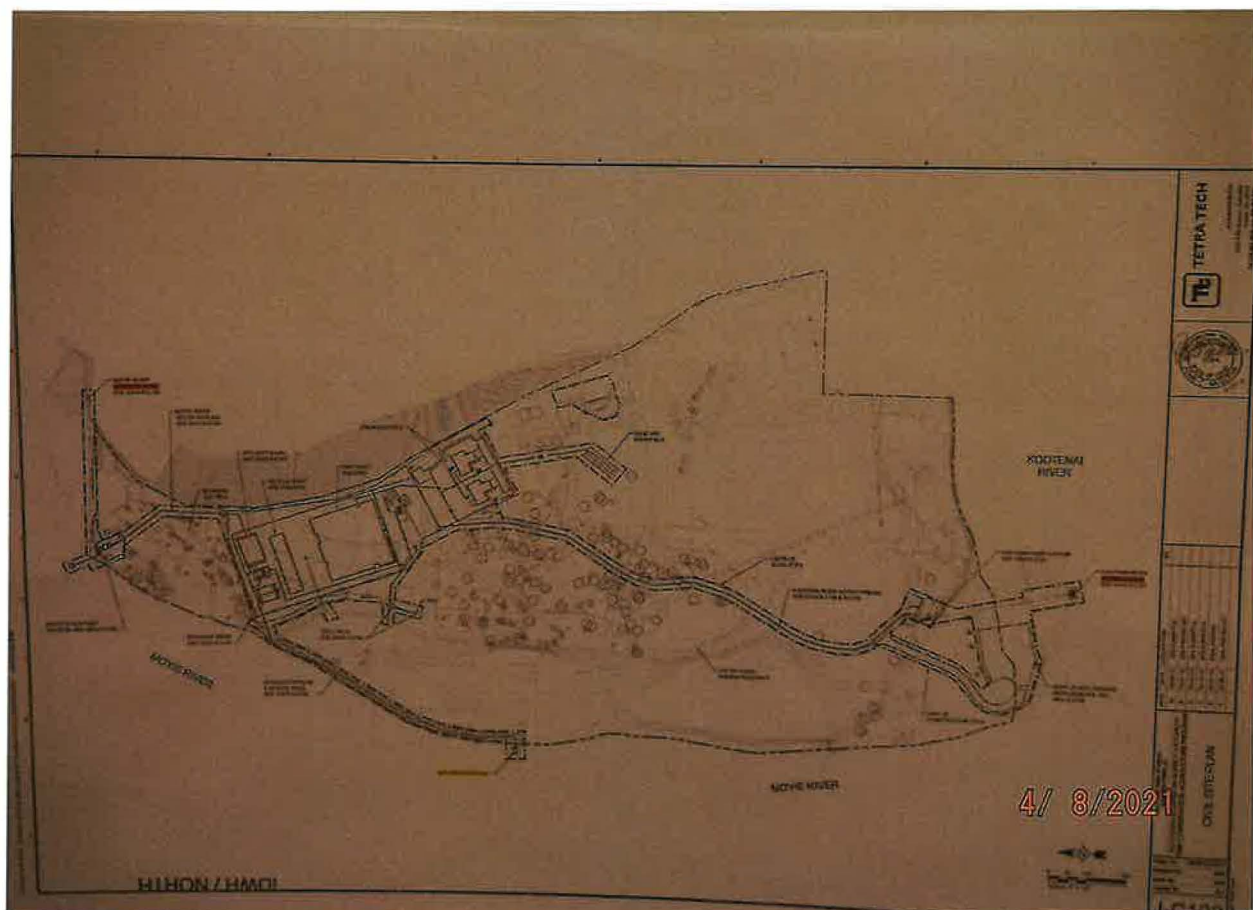
FISH PROPAGATION POU - HATCHERY OPERATIONS FOR STURGEON & BURBOT





FISH PROPAGATION POU - HATCHERY OPERATIONS FOR STURGEON & BURBOT





HATCHERY OPERATION WATER SYSTEM DIAGRAM – MOYIE RIVER INTAKE (UPPER L/H), KOOTENAI RIVER INTAKE (MIDDLE R/H), EFFLUENT OUTFALL BACK TO MOYIE RIVER (BOTTOM MIDDLE)

