

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 95-16473
Exam Date: 08/18/2020

1. Current Owner:
KOOTENAI TECHNICAL EDUCATION CAMPUS 6838 LANCASTER RD RATHDRUM ID 83858
2. Accompanied by: Colby Mattila
Phone No: 208-712-4733
Address: Same as above
Relationship to permit Holder: Director - KTEC

3. **SOURCE:**
GROUND WATER

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
95-2168B	GROUNDWATER	IRRIGATION	DECREED
95-16466 (+ 10ea others)	GROUNDWATER	MUNICIPAL	DECREED

Comments: Decreed Right 95-2168B uses groundwater for the irrigation of 158.0 acres with a POU that overlaps this permit's POU. The KTEC facility began construction prior to year 2013, and first shows up on Arcmap aerial imagery in 2013. Due to the land subdivision & land use change coupled with a period of non-use related to 95-2168B in the area of KTEC's facility there is no concern for overlap between rights; the irrigation acreage assumed by KTEC from 95-2168B is considered forfeited due to non-use of active irrigation in more than a 5-year timeframe.

Decreed Right(s) 95-16466 and 10ea additional decreed Rights belonging to the City of Rathdrum primarily use groundwater source(s) for municipal purposes, of which KTEC's facility is in the service area causing overlap between the two rights. KTEC is served by the municipal system for Domestic uses, but the heating & cooling system covered under this permit is a separate closed loop system which negates any overlap concerns between rights.

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

C. DIVERSION AND DELIVERY SYSTEM

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

GROUND WATER NE¼ NE¼, Sec. 7, Twp 51N, Rge 04W, B.M. KOOTENAI County (Injection)
-116°52.646, 47°47.136 D0060952
GROUND WATER NE¼ NE¼, Sec. 7, Twp 51N, Rge 04W, B.M. KOOTENAI County -116°52.642, 47°47.190 D0060949
GROUND WATER NE¼ NE¼, Sec. 7, Twp 51N, Rge 04W, B.M. KOOTENAI County -116°52.641, 47°47.203 D0060950
GROUND WATER NE¼ NE¼, Sec. 7, Twp 51N, Rge 04W, B.M. KOOTENAI County -116°52.643, 47°47.200 D0060951

Method of Determination: GPS; wells located at the GPS coordinates listed above.

PLACE OF USE: HEATING & COOLING

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
51N	04W	7	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
D0060949		40			
D0060950		40			
D0060951		40			

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
FLOWMETER						

2. Measurements: Applicant has a TruFlo flowmeter installed on the diverting works located where the main service trunk pipe meets the Cla-Val valve (restrictor valve). Multiple iterations of pump operations were completed, and photographs taken of the maximum flowrates observed at time of exam; the pressure sustaining valve limits flow with 2 pumps operating equal to 22.6 liters per minute (well 2 pump) + 42.9 liters per min (well 3 pump) = 65.5 liters per min that converts to 17.3 gpm or 0.04 cfs considering department rounding standards.

E. FLOW CALCULATIONS

Measured Method: In-line flowmeter readings captured during exam: 2 pumps operating = 22.6 liters per minute (well 2 pump) + 42.9 liters per min (well 3 pump) = 65.5 liters per min that converts to 17.3 gpm or **0.04 cfs** considering department rounding standards.

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation: N/A
 2. Volume Calculations for Other Uses: Maximum Diversion Volume derived for heating & cooling is not additive between beneficial uses, rather **3.1 af** combined use.

G. NARRATIVE/REMARKS/COMMENTS

Field exam performed on 8/8/2020 with the applicant's representative, Colby Mattila, showed 3ea wells providing groundwater for Kootenai Technical Campus' (KTEC) heating and cooling system. A 4th well serves as the injection well POD located approx. 550 ft SE of the KTEC facility. 3ea well POD(s): D0060949, D0060950, & D0060951 are located east of the facility and pipe to a main truck service pipe that enters the facility for heating and cooling uses. Each well was GPS located at time of exam, and each well has a 40 HP variable frequency drive pump motor installed. The permit was approved to develop up to 0.63 cfs, but the applicant is limited by a pressure sustaining Cla-Val valve installed prior to the system's heat exchanger, which greatly reduces pumping capacity used by the system.

A TruFlo flowmeter is installed on the diverting works located where the main service trunk pipe meets the Cla-Val valve (restrictor valve). Multiple iterations of pump operations were completed, and photographs taken of the maximum flow rates observed at time of exam; the pressure sustaining valve limits flow with 2 pumps operating equal to 22.6 liters per minute (well 2 pump) + 42.9 liters per min (well 3 pump) = 65.5 liters per min that converts to 17.3 gpm or 0.04 cfs considering department rounding standards. Although the 3ea diversion POD's with 40hp pumps have larger pumping capacities than the system currently operates with, I am recommending 0.04 cfs as the diversion rate to license this permit. The system is designed to operate 1-to-2 pumps at one time with the 3rd designed to run lead/lag with the others. Typically, only one pump is operational at a given time due to the restrictor plate cutting off flow-through above 15 PSI at the pressure sustaining valve, but two pumps were operated to show the valve will still limit the systems pump capacity.

During the exam, KTEC campus grounds and inside the building were explored and photographs collected of the closed loop heating/cooling system. KTEC is served by a municipal provider for their domestic & irrigation uses, and this permit's water system is stand-alone. Arcmap aerial imagery was used to trace out the POU which consists of the 56,000 sqft facility. The building's construction started in 2012 & uses current energy saving technologies in the built-out, which is assumed to reduce the heat/cool system requirements throughout the year. KTEC maintains a 71 degree heating & 76 degree cooling set-points for normal operation. The campus is not in session during a normal school summer break which allows a reduced need for cooling in the June-August timeframe. The campus is located approximately 5 miles from the Coeur D'Alene airport & is in a region of mild climate where historically HVAC use for heating is outweighs the need for cooling.

Although the applicant has a flowmeter installed on the system, prior to the field examination no annual volume reporting was tracked by the applicant, resulting in no volume records from the development period of the permit. Following the field examination, I recommended KTEC begin monthly reporting to be done the morning of the 1st day of the month to capture a volume value for the previous month. Despite not being within the development period, due to the nature of the heating/cooling system I pursued using annual reported volume from 1 February 2021 to 28 February 2022 as proxy data for licensing purposes to gage a typical annual system usage. Enclosed with the B.U. report is data that reflects a 12-month total volume = 1.7 af considering department rounding standards. I then pursued historical climate heating/cooling data for the last 50 years to determine if the reported annual volume correlated with historic degree heating/cooling day (HDD/) data.

My volume recommendation is a degree-day-based calculation applied to pre-permit weather conditions at a nearby weather station located at the CDA airport (KCOE station). The base temperature of 65 degrees when extrapolating the HDD heating/cooling data was used which is enclosed for review. The max HDD for the period-of-record at KCOE station occurred in 1985 which is within the 50-year window prior to the development period of the permit.

Using the actual weather from www.degreeedays.net and the WRCC's 1985 climate data from the CDA airport weather station KCOE, the heating volume for the water use would be 3.0 af and the cooling volume would be 0.1 af. I recommend the same total annual diversion volume of 3.1 af for both heating & cooling beneficial uses to afford the applicant maximum flexibility to meet climate variances yearly without exceeding either components volume and/or maximum diversion volume recommended of **3.1 af**.

KTEC's heating/cooling system incorporates components that were designed to use a larger diversion of water, but the system was having issues with pump capacity which led to the installation of the Cla-Val pressure sustaining valve. I was able to speak with the install technician from Hydro-tech local here in the CDA area, and it was explained that there was too great of water flow coming off the chiller to the heat exchanger causing it to overload; following install of the pressure sustaining valve the system works, and the applicant is left with a greatly over-built diverting works for the needs of the HVAC system.

Conditions 26A, 046, & X11 were removed from the permit during licensing review. A text condition was added to describe those heating & cooling uses are for a technical education campus. All other conditions on the permit shall be carried to licensing. Overlap concerns: Decreed Right 95-2168B uses groundwater for the irrigation of 158.0 acres with a POU that overlaps this permit's POU. The KTEC facility began construction prior to year 2013, and first shows up on Arcmap aerial imagery in 2013. Due to the land subdivision & land use change coupled with a period of non-use related to 95-2168B for acreage associated with KTEC's facility there is no concern for overlap between rights; the irrigation acreage assumed by KTEC from 95-2168B is considered forfeited due to non-use of active irrigation in more than a 5-year timeframe.

Decreed Right(s) 95-16466 and 10ea additional decreed Rights belonging to the City of Rathdrum primarily use groundwater source(s) for municipal purposes, of which KTEC's facility is in the service area causing overlap between the two rights. KTEC is served by the municipal system for Domestic uses, but the heating & cooling system covered under this permit is a separate closed loop system which negates any overlap concerns between rights. There are no additional overlap concerns for this 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>
HEATING	01/01 to 12/31	0.04 CFS	3.1 AF
COOLING	01/01 to 12/31	0.04 CFS	3.1 AF
Totals:		0.04 CFS	3.1 AF

2. Recommended Amendments

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

 Change P.U. as reflected above Add P.U. as reflected above X None

I. AUTHENTICATION

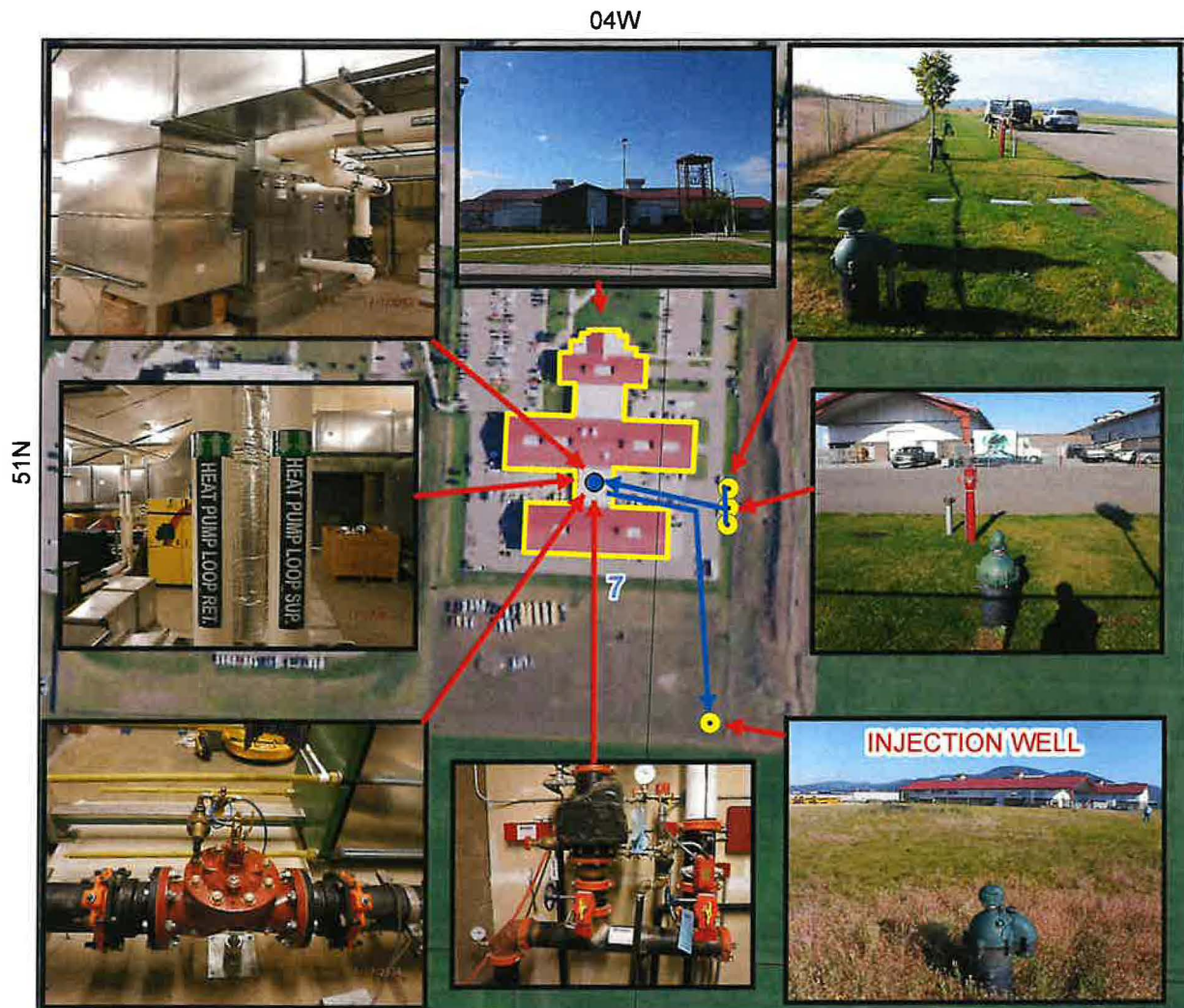
Luke Bates -

Field Examiner's Name Joe BTD Date 3/4/2022
Reviewer Ad Fink Date 7/21/2022

Reviewer Ad Fink Date 7/21/2022

State of Idaho
Department of Water Resources
Attachment to Field Exam
95-16473

HEATING and COOLING system diagram



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

0 0.035 0.07 0.14 Miles



WR #95-16473		KOOTENAI TECHNICAL EDUCATION CAMPUS			spreadsheet originated with Michele Edl on 2/23/2022				
HEATING VOLUME CALCULATIONS									
		totalizer data	date		comment				
		527850	12/31/2021		other heat sources (kids, lights, computers...) mostly absent				
		373349	12/1/2021						
A		154501	gallons/ time period		totalizer difference / time				
B		1146.7	HDD/ that same time period		HDD website calculator* or manual calculations from a nearby station				
					use Base65 for both short & long term HDD CDD data set consistency				
A/B		134.74	gal / HDD		unitized as representative of the bldg operation				
	gal/AF		325851.4319		conversion factor				
D		6579.84	long-term avg annual HDD		Coeur D Alene station calculations by WRCC**				
A/B x D		886536.897	gal / avg yr						
		2.721	convert gal to AF						
		2.7	AF for heating avg HDD yr						
A/B		134.74	gal / HDD						
	gal/AF		325851.4319		conversion factor				
E		7155		1985	50 yr period-of-record max HDD at Coeur D Alene station calculated by WRCC				
A/B x E		964031.268	gal / yr with max HDD						
		2.958	convert gal to AF						
		3.0	AF heating during the highest HDD yr						
COOLING VOLUME CALCULATIONS									
		totalizer data	date		comment				
		261877	6/30/2021		other heat sources are in the bldg				
		253997	6/1/2021						
A		3940.00	gallons / time period		totalizer difference / time				
B		249.4	CDD / that same time period		CDD website calculator* or manual calculations from a nearby station				
A/B		15.797915	gal / CDD		unitized as representative of the bldg operation				
	gal/AF		325851.4319						
F		362.32	long-term avg annual CDD		Coeur D Alene station calculations by WRCC**				
A/B x F		5723.900561	gal / avg yr						
		0.018	AF for cooling avg CDD yr						
A/B		15.797915	gal / CDD						
	gal/AF		325851.4319		conversion factor				
G		447		1985	Coeur D Alene station calculations by WRCC; must use same max year				
A/B x G		7061.668003	gal / yr for cooling during the max HDD year						
		0.1	AF for cooling during the max HDD year						
					* try degree.days.net to collect calculated HDD and CDD				
					** https://wrcc.dri.edu/Climate/west_coop_summaries.php				
					site provides long-term statistics for most weather stations				
DO A QUICK REALITY CHECK									
consider comparing projected volume with continuous run-time									
1.) volume totalizing flowmeter total from 3/01/2021 to 2/28/2022 = 1.7 af, considering Department rounding standards.									
2.) Projected total annual volume using historical climate data from above = 3.0 af (heating) + 0.1 af (cooling) = 3.1 af									
I recommend licensing the Permit for this volume, to provide a buffer to the applicants in order to mitigate cyclic climate variations in future years, considering the beneficial use is a non-consumptive use.									
3.) Continuous pump run time at 0.04 cfs for year = 29.0 af									

KOOTENAI TECHNICAL EDUCATION CAMPUS ANNUAL VOLUME

READING DATE (close of business that day)	VOLUME (LITERS)	VOLUME (GALLONS)	MONTH TOTAL (GAL)	MONTH TOTAL (AF)
7-Jan-21	8845169	2336646.0	monitoring start date for volume	
31-Jan-21	9169904	2422431.9	85785.9	0.3
28-Feb-21	9999999	2641719.7	219287.9	0.7
31-Mar-21	1-Mar-21 - zero'd	124833	39047	0.120
30-Apr-21		242208	22920	0.070
31-May-21		253997	11789.0	0.036
30-Jun-21		261877	7880	0.024
31-Jul-21		265982	4105	0.013
31-Aug-21		273724	7742	0.024
30-Sep-21		278345	4621	0.014
31-Oct-21		302148	23803	0.073
30-Nov-21		373349	71201	0.219
31-Dec-21		527850	154501	0.474
31-Jan-22		654418	126568	0.388
28-Feb-22	Feb 28th last reading	741707	87289	0.268
		12 month Total (AF)=		1.72

flowmeter was initially installed to read liters per min; it had operated and was near the reset back to zero morning of 1 March 2021, and I had them switch it over to GPM. Due to probable erroneous reading in February 2021, readings derived during period of liters per minute were not used in volume calculations.

NOTE: used data from 1-March-2021 through 28-February-2022 to evaluate 12 month annual Vol use

Calculations: Vol (Gal) - previous month reading Vol (Gal) = Monthly Total (Gal) and
 Monthly Total (Gal) / 325,850 gal per acre-foot = Monthly Total (AF) as highlighted in yellow.
 Sum 12 months Monthly Total (AF) = 12 Month Total (AF)

sqft building = 56,000; large portion receives passive heating, main heating for classrooms/common areas

System Temp set points = 71 deg heating & 76 deg cooling

closed loop system, stand alone no other beneficial uses from source(s) or to injection well. KTEC uses municipal provider water for their domestic use, separate system.

system designed semi-lead/lag with 2 well pumps operating at one time & 3rd in standby to pick up load as required. The system was designed for open flow from wells, but after build-out they found the higher diversion rate from source was causing issues with heat exchanger operations & a pressure sustainability valve was installed from the common service in pipeline & heat exchanger. This limits 2 pumps operating at one time to approx 18 gpm. LARGEST OBSERVED - well 2 pump (22.6 liters per min) + well 3 pump (42.9 liters per min) = 65.5 liters per min = 17.3 gpm = **0.04 cfs**

Degree Heating Day Chart Data

Description:	Fahrenheit-based heating degree days with a base temperature of 65 F	
Source:	www.degreedays.net	
Accuracy:	Estimates were made to account for missing data: the "% Estimated" column shows how much each figure was affected (0% is best, 100% is worst)	
Station:	Coeur d'Alene, Coeur d'Alene Air Terminal, ID, US (116.82W,47.77N)	
Station ID:	KCOE	
Period:	12/1 - 12/31 2021	
Note:	Distance from station KCOE to KTEC campus = 5.3 miles, both residing within the prairie between Rathdrum, ID and Hayden, ID.	
Date	HDD 65	% Estimated
12/1/2021	10.4	0
12/2/2021	19.2	0
12/3/2021	31.5	0
12/4/2021	32.1	0
12/5/2021	38.8	0
12/6/2021	41.3	0
12/7/2021	36	0
12/8/2021	30.9	0
12/9/2021	35.6	0
12/10/2021	35	0
12/11/2021	28.8	0
12/12/2021	29.6	0
12/13/2021	33.8	0
12/14/2021	32.3	0
12/15/2021	38.3	0
12/16/2021	38.7	0
12/17/2021	51.8	0
12/18/2021	37.3	0
12/19/2021	34.5	0
12/20/2021	39.1	0
12/21/2021	41.4	0
12/22/2021	30.9	0
12/23/2021	29.4	0
12/24/2021	32.8	0
12/25/2021	34.7	0
12/26/2021	40.4	0
12/27/2021	47.9	0
12/28/2021	54.2	0
12/29/2021	54	0
12/30/2021	52.4	0
12/31/2021	53.6	0
TOTAL HDD 65	1146.7	

Degree Cooling Day Chart Data

Description:	Fahrenheit-based cooling degree days with a base temperature of 65 F	
Source:	www.degreedays.net	
Accuracy:	Estimates were made to account for missing data: the "% Estimated" column shows how much each figure was affected (0% is best, 100% is worst)	
Station:	Coeur d'Alene, Coeur d'Alene Air Terminal, ID, US (116.82W,47.77N)	
Station ID:	KCOE	
Period:	6/1 - 6/30 2021	
Note:	Distance from station KCOE to KTEC campus = 5.3 miles, both residing within the prairie between Rathdrum, ID and Hayden, ID.	
Date	HDD 65	% Estimated
6/1/2021	9.3	0
6/2/2021	11.8	0
6/3/2021	11.1	0
6/4/2021	6.8	0
6/5/2021	0.4	0
6/6/2021	0	0
6/7/2021	0	0
6/8/2021	1.4	0
6/9/2021	0	0
6/10/2021	0.3	0
6/11/2021	0.2	0
6/12/2021	1.2	0
6/13/2021	8.5	0
6/14/2021	7.3	0
6/15/2021	0	0
6/16/2021	1.1	0
6/17/2021	5.1	0
6/18/2021	7.5	0
6/19/2021	7.4	0
6/20/2021	6	0
6/21/2021	8.9	0
6/22/2021	12.1	0
6/23/2021	11.9	0
6/24/2021	10.5	0
6/25/2021	12.4	0
6/26/2021	16.3	0
6/27/2021	19.2	0
6/28/2021	22.1	0
6/29/2021	25.5	0
6/30/2021	25.1	0
TOTAL HDD 65	249.4	

COEUR D ALENE, IDAHO

Monthly Total Heating Degree Days

(101956)

Base Temperature = 65 F

File last updated on Apr 4, 2013

*** Note *** Provisional Data *** After Year/Month 201304

a = 1 day missing, b = 2 days missing, c = 3 days, ..etc.,

z = 26 or more days missing, A = Accumulations present

Long-term means based on columns; thus, the monthly row may not sum (or average) to the long-term annual value.

Months with 5 missing days or less use mean for missing day(s)

Individual Months not used for annual or monthly statistics if more than 5 days are missing.

Individual Years not used for annual statistics if any month in that year has more than 5 days missing.

YEAR(S)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
1895	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	386.00	473.50	805.50	1064.50	2729.50
1896	1069.00	820.50	891.00	670.00	520.50	178.00	21.50	51.50	231.21a	476.50	1001.00	896.50	6827.21
1897	1121.50	939.50	1060.00	540.00	197.00	172.00	113.15a	29.50	259.50	522.00	873.00	1081.00	6908.15
1898	1167.50	841.56a	975.00	528.50	235.00	129.50	74.00	37.00	0.00z	0.00z	0.00z	0.00z	3988.06
1899	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00
1900	973.00	1009.50	770.50	473.50	344.00	129.50	48.50	0.00z	0.00z	0.00z	0.00z	0.00z	3748.50
1901	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00
1982	1097.00	935.00	762.50	656.50	357.50	91.50	68.00	15.50	184.00	536.00	873.00	1030.50	6607.00
1983	885.50	725.00	648.00	543.00	291.00	128.50	82.00	6.50	254.00	455.50	742.00	1322.00	6083.00
1984	1034.50	845.50	725.00	572.00	426.50	182.00	24.50	14.00	262.00	586.50	810.00	1180.00	6662.50
1985	1192.50	1031.50	845.00	475.00	241.00	106.00	0.00	48.00	320.00	540.00	1130.00	1226.00	7155.00
1986	1005.00	873.50	614.00	543.50	324.00	39.50	48.50	0.00a	0.00z	0.00z	0.00z	0.00z	3448.00
1987	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00
1988	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00
1989	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00
2011	1043.00	1012.00	846.00	713.50	415.00	210.00	56.00	6.00	106.07b	475.50	863.50	1025.50	6772.07
2012	1030.00	906.00	822.00	531.00	358.00	208.00	20.50	18.00	80.56c	487.22a	747.00	957.00	6165.27
2013	1137.50	835.50	774.48a	24.50z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	2747.48

Period of Record Statistics

MEAN	1134.47	917.97	822.51	562.22	325.52	142.24	30.60	35.27	193.30	499.60	833.51	1054.51	6579.84
S.D.	176.93	127.03	99.29	80.16	75.21	48.96	22.37	24.57	77.04	67.49	89.60	115.37	444.81
SKEW	1.24	1.47	0.23	-0.32	0.01	0.03	0.92	0.71	0.39	-0.21	0.39	0.57	0.07
MAX	1747.00	1485.00	1076.50	713.50	520.50	249.00	113.15	98.50	415.00	654.00	1130.00	1373.50	7589.00
MIN	798.80	712.00	614.00	327.50	136.00	38.00	0.00	0.00	38.50	285.00	665.50	819.50	5531.25
NO YRS	95	95	93	90	95	96	96	94	93	88	90	92	74

LINK: <https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?id1956>Data extracted from Western Regional Climate Center: WRCC@DRI.EDU ON 2/23/2021 BY LUKE BATES, Idaho Dept. Water Resources.

COEUR D ALENE, IDAHO

Monthly Total Cooling Degree Days

(101956)

Base Temperature = 65 F

File last updated on Apr 4, 2013

*** Note *** Provisional Data *** After Year/Month 201304

a = 1 day missing, b = 2 days missing, c = 3 days, ..etc.,

z = 26 or more days missing, A = Accumulations present

Long-term means based on columns; thus, the monthly row may not sum (or average) to the long-term annual value.

Months with 5 missing days or less use mean for missing day(s)

Individual Months not used for annual or monthly statistics if more than 5 days are missing.

Individual Years not used for annual statistics if any month in that year has more than 5 days missing.

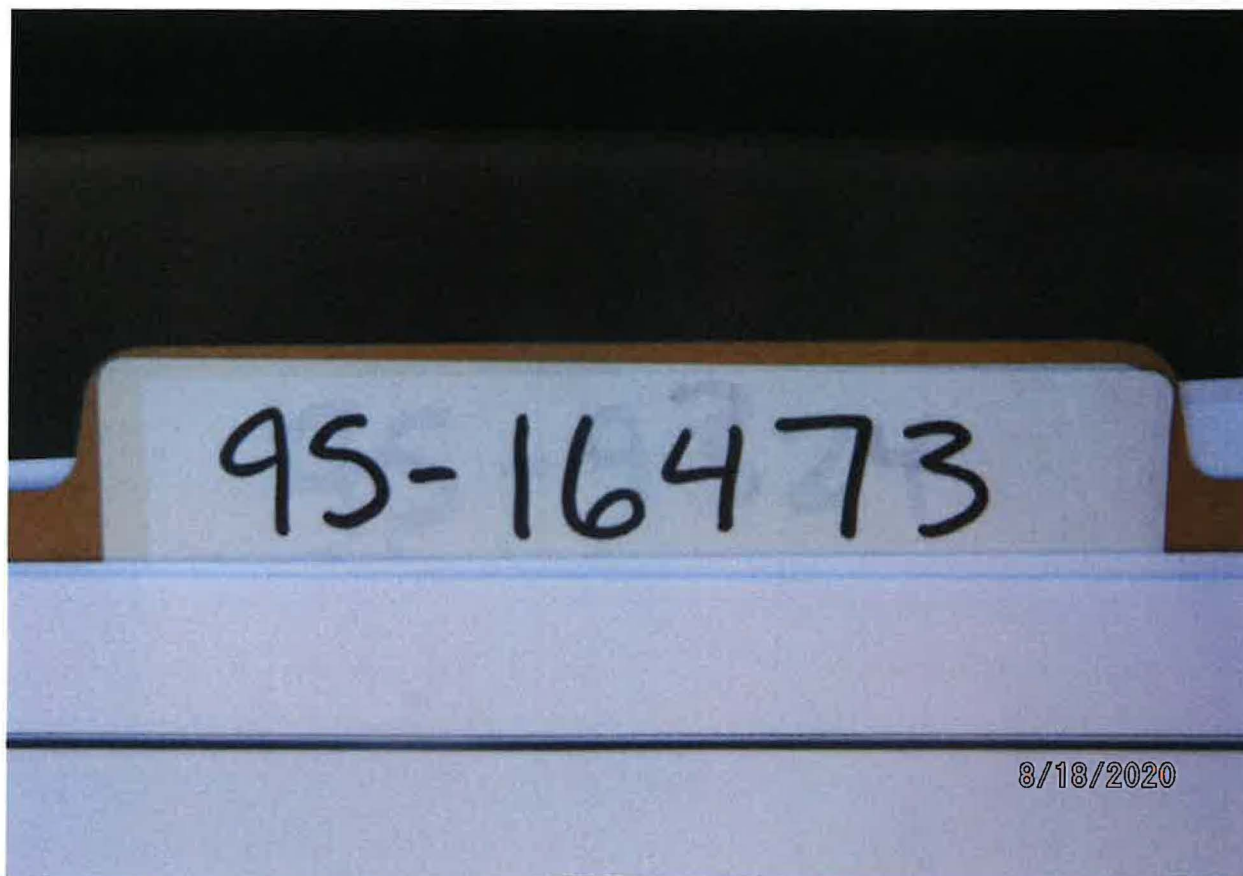
YEAR(S)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
1895	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	12.50	0.00	0.00	0.00	12.50
1896	0.00	0.00	0.00	0.00	0.00	52.50	174.00	76.50	15.52a	0.00	0.00	0.00	318.52
1897	0.00	0.00	0.00	0.00	48.00	20.50	59.93a	165.50	7.50	0.00	0.00	0.00	301.43
1898	0.00	0.00a	0.00	0.00	4.50	42.00	88.50	312.50	0.00z	0.00z	0.00z	0.00z	447.50
1899	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00
1900	0.00	0.00	0.00	0.00	0.50	45.00	109.00	0.00z	0.00z	0.00z	0.00z	0.00z	154.50
1901	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00
1982	0.00	0.00	0.00	0.00	0.00	98.00	126.50	150.00	27.50	0.00	0.00	0.00	402.00
1983	0.00	0.00	0.00	0.00	30.50	22.50	49.50	181.50	10.50	0.00	0.00	0.00	294.50
1984	0.00	0.00	0.00	0.00	3.50	27.00	167.00	209.50	21.00	2.00	0.00	0.00	430.00
1985	0.00	0.00	0.00	0.00	15.50	38.00	326.00	65.50	2.00	0.00	0.00	0.00	447.00
1986	0.00	0.00	0.00	0.00	60.00	125.00	73.50	332.22a	0.00z	0.00z	0.00z	0.00z	590.72
1987	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00
1988	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00
1989	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00
2011	0.00	0.00	0.00	0.00	0.00	11.50	71.50	177.00	72.32b	1.50	0.00	0.00	333.82
2012	0.00	0.00	0.00	0.00	4.00	10.50	189.00	176.00	15.00c	0.00a	0.00	0.00	394.50
2013	0.00	0.00	0.00a	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00

Period of Record Statistics

MEAN	0.00	0.00	0.00	0.28	8.23	39.27	155.51	142.28	25.57	0.24	0.00	0.00	362.32
S.D.	0.00	0.00	0.00	1.37	12.86	30.72	58.21	62.15	25.74	0.73	0.00	0.00	103.37
SKEW	0.00	0.00	0.00	5.30	2.41	1.38	0.53	0.71	1.78	3.85	0.00	0.00	0.56
MAX	0.00	0.00	0.00	8.50	62.50	152.50	326.00	332.22	119.50	4.50	0.00	0.00	690.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	47.00	33.50	0.00	0.00	0.00	0.00	131.50
NO YRS	95	95	93	90	95	96	96	94	93	88	90	92	74

LINK: <https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?id1956>Data extracted from Western Regional Climate Center: WRCC@DRI.EDU ON 2/23/2021 BY LUKE BATES, Idaho Dept. Water Resources.

Heating &
Cooling Year
used 1985's
within 50 year
window of 2000.
(98)



FIELD EXAM DATE 8/18/2020



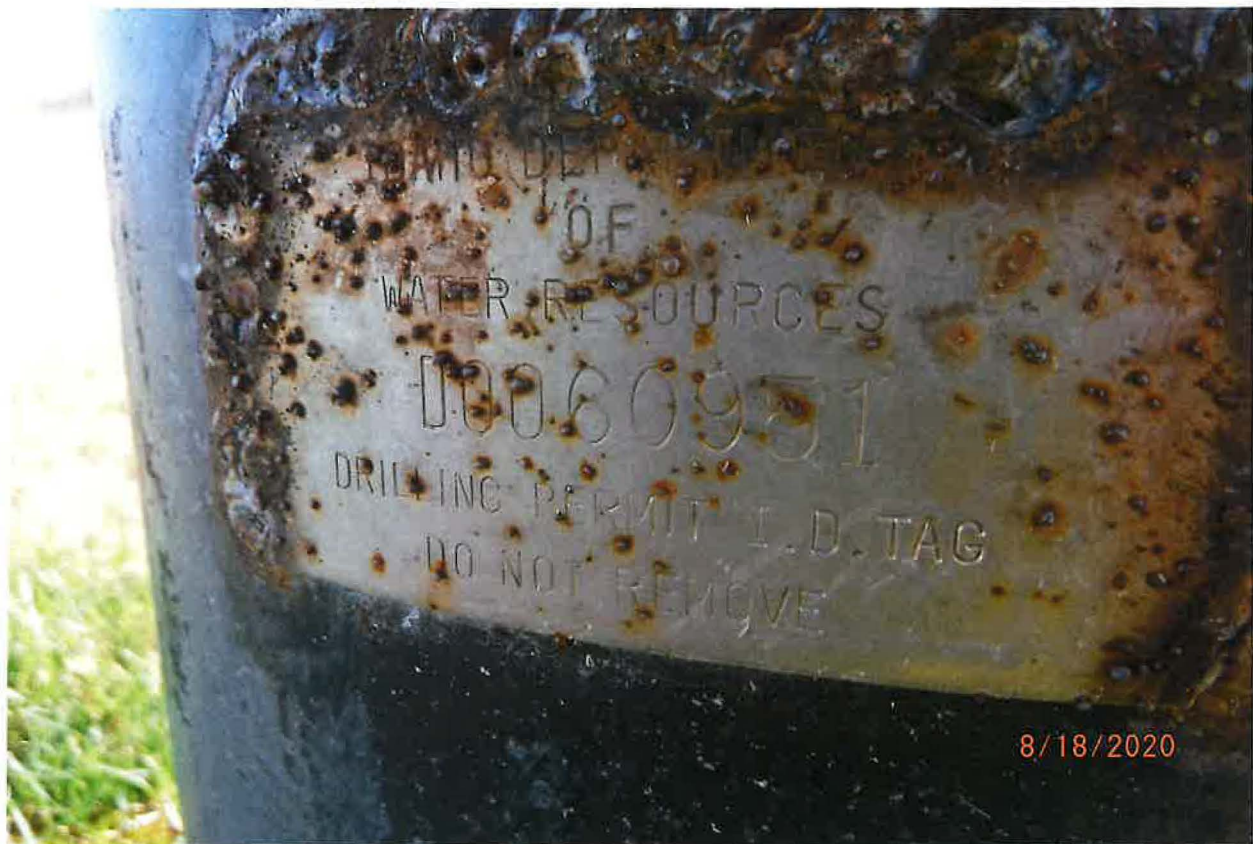
GROUNDWATER POD 1 OF 4 - WELL D-TAG D0060952 (INJECTION WELL)



WELL D-TAG D0060952 (INJECTION WELL)



GROUNDWATER POD 2 OF 4 – WELL D-TAG D0060951, MIDDLE IN ROW OF 3 WELLS (PRODUCTION WELL)



WELL D-TAG D0060951



GROUNDWATER POD 3 & 4 OF 4 - FRONT AND BACK IN PHOTO – WELL D-TAG D0060949 & D0060950
(PRODUCTION WELLS)



WELL D-TAG D0060949



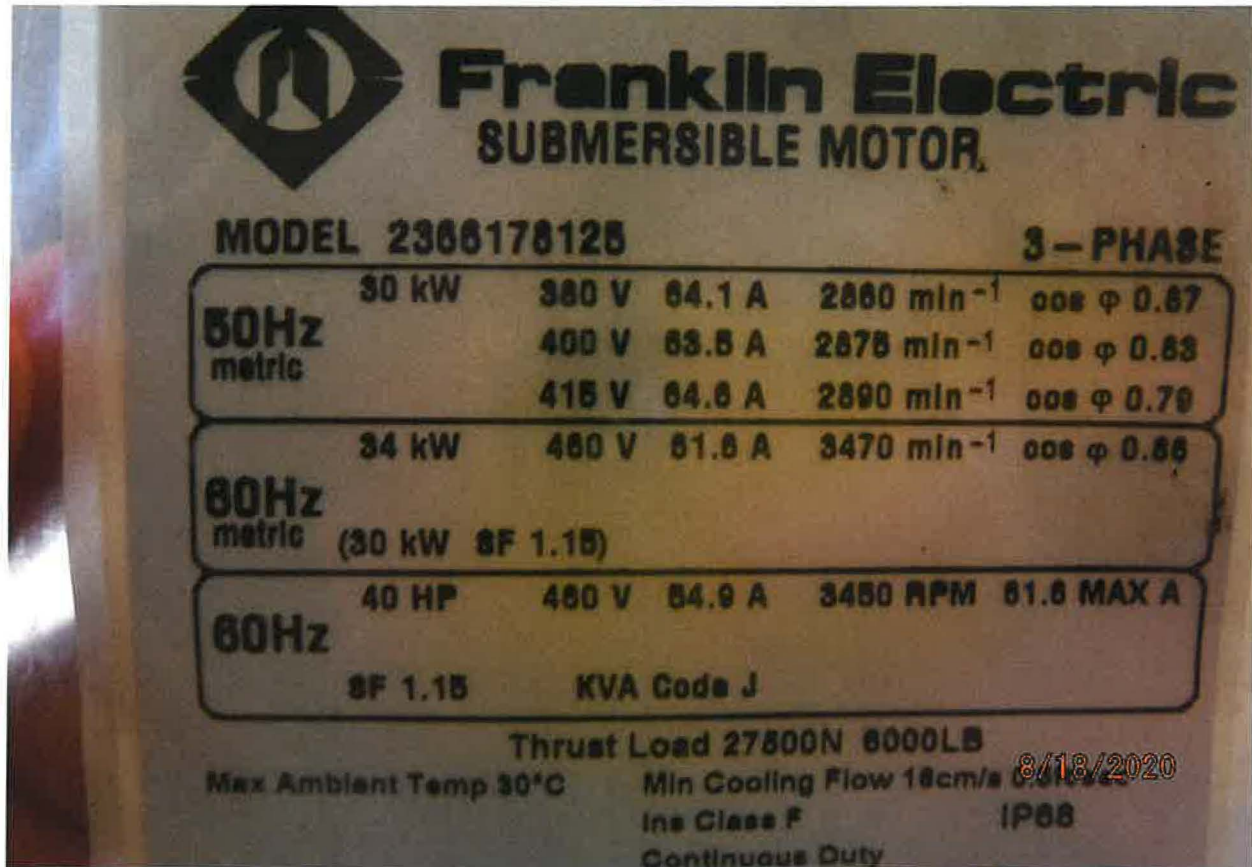
WELL D-TAG D0060950



WELL 1 SYSTEM CONTROL PANEL – VFD 40 HP PUMP MOTOR INSTALLED IN WELL



CONTROL PANELS FOR WELL(S) 2 AND 3



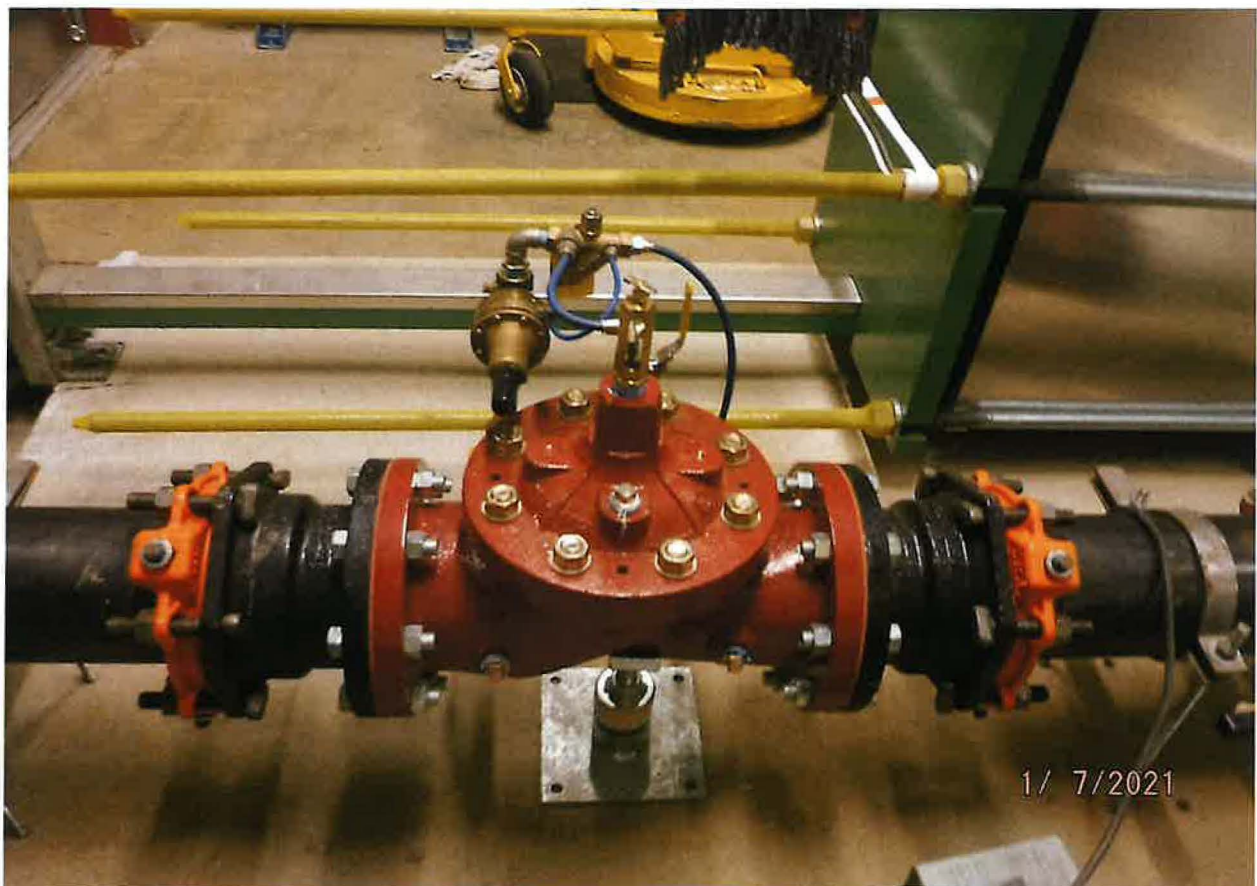
3EA WELLS HAVE 40 HP VFD PUMP MOTORS INSTALLED



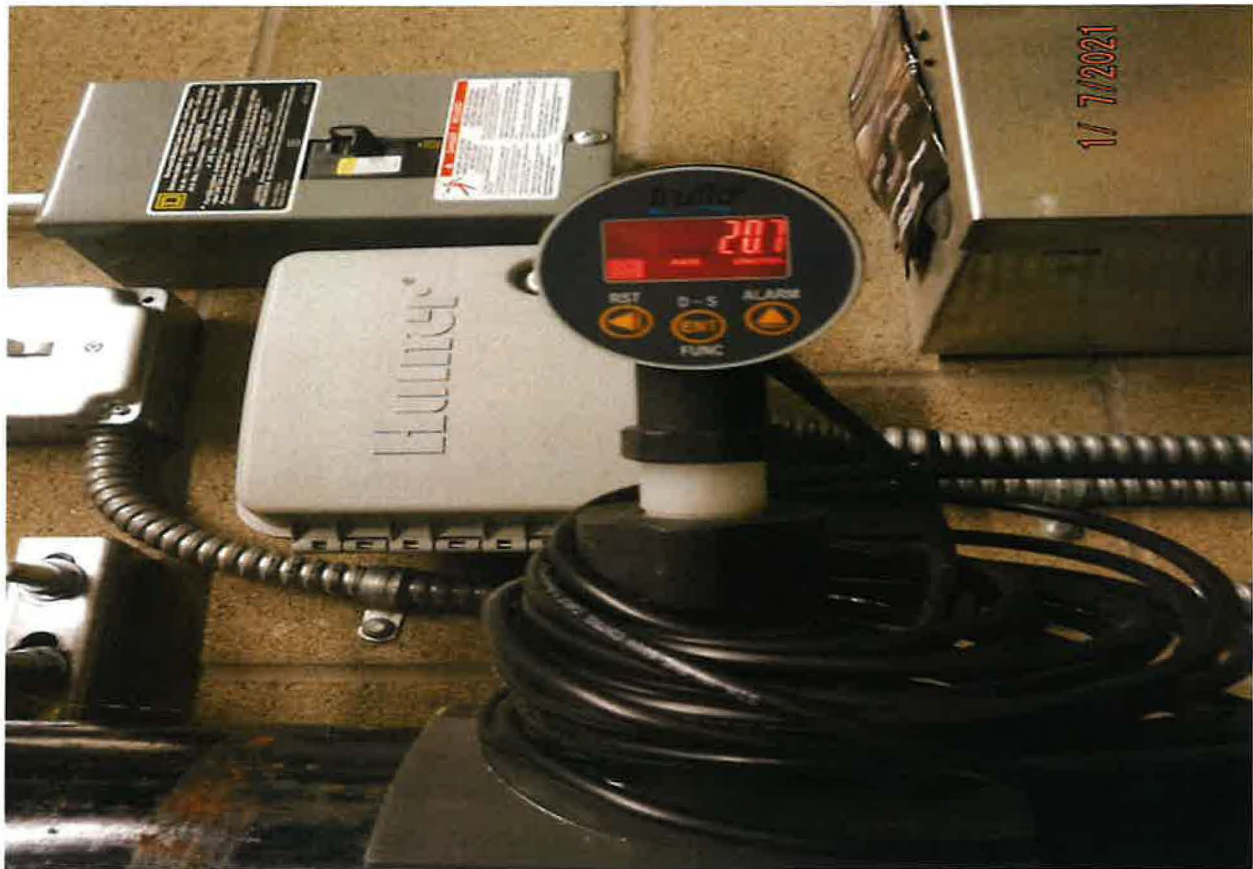
45 PSI OPERATING PRESSURE



WATER CONVEYANCE SYSTEM



RESTRICTER PLATE INSTALLED – LIMITS FLOW THROUGH FROM SOURCE(S) TO HEAT EXCHANGER TO 18.0 GPM



FLOWMETER WELL #1 – 20.7 LITERS PER MIN



FLOW METER WELL 2 - 22.6 LITERS/MIN



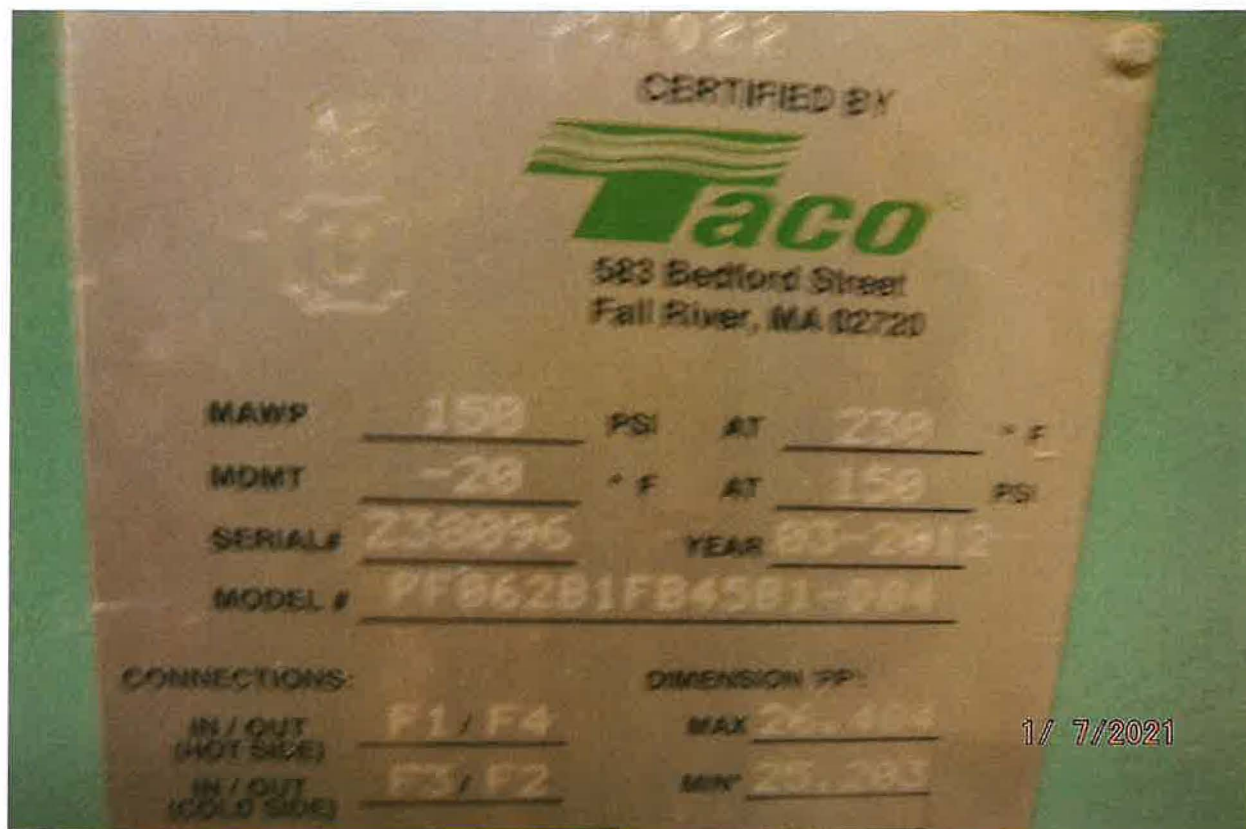
8/18/2020

FLOW METER WELL 3 – 42.9 LITERS/MIN

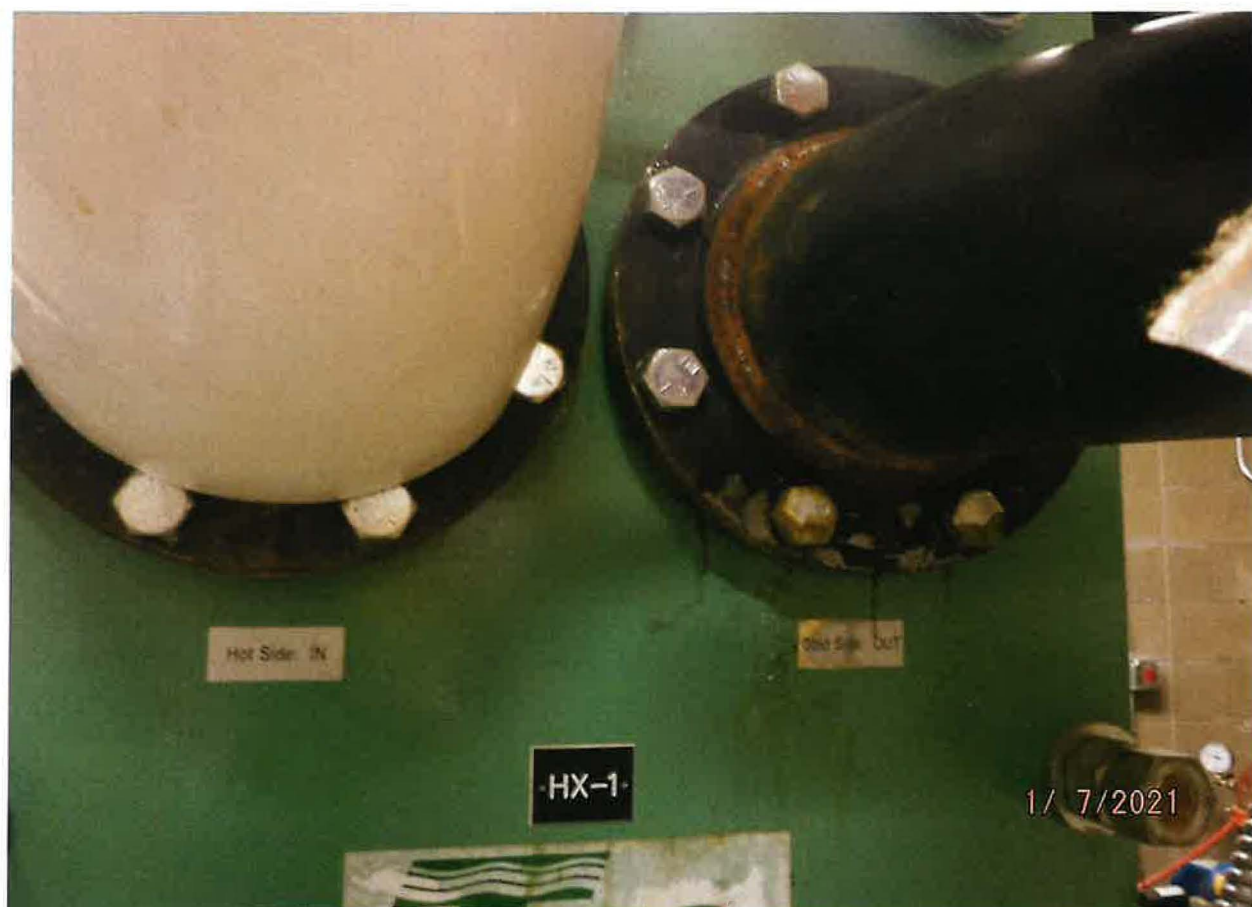


8/18/2020

HEATING AND COOLING – HEAT EXCHANGER



HEAT EXCHANGER DATA PLATE



INFLOW/OUTFLOW PIPING FROM HEAT EXCHANGER



INSULATED HEAT PUMP LOOP LINE(S)



HEATING/COOLING SYSTEM DUCTING (UPSTAIRS IN KTEC FACILITY)



HEATING & COOLING POU



HEATING AND COOLING POU – KOOTENAI TECHNICAL EDUCATION CAMPUS

HEATING & VENT UNIT SCHEDULE			
RATING BASE: 2,200 FT. ELEV., SUMMER SET DB/75F WB, WINTER OF			
DESIGNATION	HV-1	HV-2	
MANUFACTURER	CARRIER	CARRIER	
MODEL NUMBER	35MN	35MN	
LOCATION	207 MECHANICAL	209 MECHANICAL	
SERVICE	104 WELDING TECH	176 CONSTRUCTION	
TYPE	HORIZONTAL	HORIZONTAL	
HEATING COIL	CAPACITY (MBH)	1538	572.8
	GPM	171	42.5
	FLUID PD (FT HG)	7.4	6.0
	SOFT/POWS/TPH	40/2/12	13.5/2/14
	FACE VELOCITY	487.2	550
	AR PD (IN HG)	0.28	0.41
FAN	CFM	20100	8000
	ESP/TSP (IN WG)	0.75/1.5	0.75/1.62
	RPM	1800	1800
	HP	15	5
ELEC	MCA/MCCP	22.5/40	8.1/10
	VOLTS/PHASE	480/3	480/3
FILTER	(QTY) SIZE	(24) 16x15x2	(4) 20x24
	TYPE	MERV-8	MERV-8
OPERATING WT	4426	2083	
VENTILATION (CFM)	1360	2040	
ACCESSORIES/NOTES	1,2,3	1,2,3	

HEAT RECOVERY UNIT SCHEDULE			
RATING BASE: 2,200 FT. ELEV., SUMMER SET DB/75F WB, WINTER OF			
DESIGNATION	HRV-1	HRV-2	
MANUFACTURER	VENMAR	VENMAR	
MODEL NUMBER	ERX0000-78	ERX-50-S-A	
LOCATION	211 MECHANICAL	211 MECHANICAL	
SERVICE	117 AUTO TECH	TERMINAL UNITS	
TYPE	ENTHALPY WHEEL	ENTHALPY WHEEL	
SUPPLY FAN	CFM	13600	6000
	ESP (IN WG)	2.61	3.22
	HP	(2) 5	(2) 3
	VOLTS/PHASE	480/3	480/3
EXHAUST FAN	CFM	13600	6000
	STATIC PRESS	2.61	2.73
	HP	(2) 5	(2) 3
	VOLTS/PHASE	480/3	480/3
OA (DB/WB °F)	80/67	86/67	
EA (DB/WB °F)	90/83.6	80/83	
RELATIVE HUMIDITY %	21.7	22	
RA (DB/WB °F)	75/57	75/57	
SA (DB/WB °F)	83/82.9	83.9/81.3	
TOTAL CAPACITY (SUMMER/WINTER)	285.3/721.2	111.3/308.5	
TOTAL EFFICIENCY (SUMMER/WINTER)	63.4/85.3	500/82.5%	
NOTES	1,2,3,4,5,6,7,8,9	1,2,3,4,5,6,7,9	

- NOTES:
1. PROVIDE EQUIPMENT PAD W/ VIBRATION ISOLATION RAIL BASE
 2. PROVIDE ACCESS DOORS ON THE SIDE OF THE UNIT AS SHOWN ON DRAWINGS
 3. PROVIDE RETURN SMOKE DAMPERS

- NOTES:
1. FACTORY PACKAGED CONTROLS W/ START-STOP BY DOCS
 2. WFO CYCLE FROST CONTROL
 3. WHEEL ROTATION ALARM CONTACTS
 4. PROVIDE WFO FOR EACH SUPPLY AND RETURN FAN
 5. EXTERNALLY FUSED DISCONNECT SWITCH
 6. PROVIDE W/ 1800 ECONOMIZER OPTION
 7. EC TO PROVIDE DUCT SMOKE DETECTOR IN RETURN AIR DUCT
 8. EC TO PROVIDE DUCT SMOKE DETECTOR IN SUPPLY AIR DUCT
 9. PROVIDE POSITIVE SHUTOFF OSA AND EXHAUST DAMPERS

8/18/2020

SAWDUST COLLECT	
DESIGNATION	DC-
MANUFACTURER	STERN
MODEL NUMBER	DA-4
LOCATION	GROUND
SERVICE	176 CON
TYPE	
CFM	40
ESP (IN)	
FAN MOTOR	HP
	DRIVE
	VOLTS/PHASE
FILTER	TYPE
	AREA (SQ)
HOPPER	TYPE
	NUMBER OF CONTAINERS
	CAP (GAL)
CLEANING SYSTEM	LOCATION
	SHOWER
	HP
STARTER	VOLTS/PHASE
CONTROL	
NOTES	