

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 22-13800

Exam Dates: 12/10/2024

Accompanied by: Barry Lewis, Maintenance Manager at Teton Homestead

Examiner: Christian Stewart, IWDR Senior Water Resource Agent

1. Current Owner:

18 N. MAIN LLC
970 W BROADWAY STE E #120
JACKSON, WY 83001

2. **SOURCE: GROUND WATER**

B. OVERLAP REVIEW

1. Place of Use: No overlap.

2. Point of Diversion: No overlap.

C. DIVERSION AND DELIVERY SYSTEM

Freshwater is drawn from the buried freshwater withdrawal well west of the building. Water enters the building through 6" insulated pipe located in the "Storage 5" room in the basement. Water travels across the ceiling and eventually into the heat exchange room. The heating and cooling system is used for the commercial building above. Heated or cooled (used) water is returned through the same path to the "Storage 5" room, where it leaves the building. The water flows into a buried injection well northwest of the building and returns to the aquifer.

1. **POINT OF DIVERSION:**

GROUND WATER SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$, Sec. 26, Twp 05N, Rge 45E, B.M. TETON County

Method of Determination: Well drilling reports

The extraction and injection wells were unable to be physically located at ground level during the examination. Water used for the heat exchanger was traced to two pipes that

exited the building 1 floor below ground level. There was no evidence at the surface of where the wells are located. Well logs and design diagrams indicate that the pipes split away and connect to the injection and extraction wells, which are located within 100 feet of each other. Correspondence with the current property manager indicated that the wells are probably buried.

2. 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	
05N	45E	26												X					

Method of Determination: Site inspection.

4. SYSTEM SPECIFICATIONS:

Well ID:

D0049687 Extraction Well

D0049659 Injection Well

Motor: 2 Baldor Electric 5hp motors

D. FLOW CALCULATIONS

Flow was unable to be directly measured due to the physical characteristics of the diversion and distribution system. All pipes are insulated, and the wells are buried, so there was not enough space to use the magnetic flow meter. Theoretical calculations were performed to estimate the standard operating capacity of the diversion.

The basement floor lies approximately 12 feet below ground surface level. The groundwater levels were measured in the sump system to be 6 ft below basement level at the time of the site visit. The pumps were 2 feet above basement level, creating a head of 8 ft. System PSI was 44. The 2 pumps had a combined 10 HP.

$$Q = \frac{8.8 * 10 * .7}{8 + (2.31 * 44)} = 0.56 CFS$$

Todd Meling of ACE Engineering determined in 2007 that 804,000 BTU is the maximum instantaneous cooling load required for the building characteristics.

$$\Delta Ts = .3 * (t2 - t1)$$

$$\Delta Ts = .3 * (70^{\circ}\text{F}(\text{inside}) - 43^{\circ}\text{F}(\text{water})) = 8^{\circ}\text{F}$$

$$\text{BTU} = 804,000$$

$$\text{GPM} = \frac{\text{BTU}/\text{hour}}{500 * \Delta Ts}$$

GPM = 201 gpm (0.45 CFS) normal operating maximum flow

The system is not capacity limited, and the normal operating maximum flow estimate comes within 10% of the permitted rate, so the system will be licensed for the full 0.5 CFS.

F. VOLUME CALCULATIONS

The system did not have a totalizing volume meter.

The equation for heating requirements for a building is

$$\frac{\text{BTU}}{\Delta T * \text{hrs}} = e * A$$

ΔT = absolute (Observed Temp – 70F)

e = .2938 efficiency factor (highly efficient, back-calculated from Todd Meling)

A = 37,500 square feet Colter Building

Thus, heating/cooling demand is 11,018 BTU ΔT / hour.

11,018 BTU/(500*8F) = 2.75GPM or **0.01217 AF/degree day**

According to Energy Star, Postal Code 83422(Driggs) has 7812(F) average annual heating degree days and 346(F) cooling degree days from 2009-2023.

<https://portfoliomanager.energystar.gov/pm/degreeDaysCalculator>

Degree Days = Days x (Observed Degrees-65 degrees F). While degree days were not calculated to 70 degrees Fahrenheit, this method still produces a more precise estimate than monthly temperature averages, which negate daily heating and cooling cycles.

Heating 7812 days * 0.01217 AF/day = 95 AF

Cooling 346 days * 0.01217 AF/day = 4 AF

Combined average flow = 99 AF. There is no functional difference in how the system operates regardless of whether it is heating or cooling. This will be licensed for both heating and cooling to create flexibility.

G. NARRATIVE/REMARKS/COMMENTS

Permit Development Timeline:

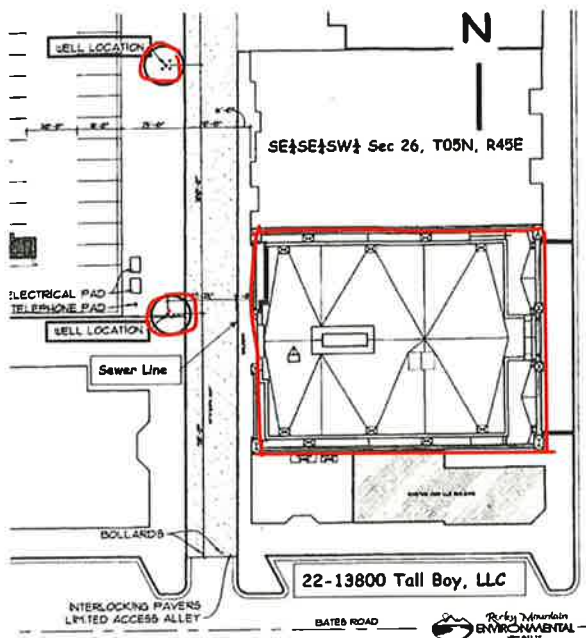
License will be issued with original priority date because the permitholder submitted proof of beneficial use within requirements. The original permit was owned by Tall Boy LLC, the developer. The property was eventually deeded to 18 N Main LLC, the current landowner.

The point of diversion likely lies on property now owned by the City of Driggs, as the pipes exit the building and may lie beyond the parcel boundaries. The heat exchange system is run year-round as required to maintain a suitable temperature for the building. A measuring device or lockable controlling works is not currently required.



The two 5 hp motor nameplates

2008 Engineering Planning Diagram



2011 Google Earth Imagery (wells drilled in 2008). Proposed well locations are covered by a parking lot by 2011. Well log information indicates wells were drilled close to the proposed locations.



Well locations as indicated in the planning diagram are covered by a parking lot by 2011. The field examination confirmed that the pipes exit the basement of the building 27 feet due-east of the supposed location of the well as indicated by the engineering planning diagram.



Storage Room 5 in the basement of the Colter Building. This photo is facing west where the pipes leave the building and towards the buried well and injection well. The water supply is the pipe on the left and the water return is the pipe on the right. This matches design plans that show the withdrawal well located south of the injection well.



Main heat exchanger room in the basement of the Colter Building. The two motors are red in the bottom right corner.



Pressure gage.

Diagram of well conveying water to heat exchanger and back to the injection well



X Yes _____ No _____

H. RECOMMENDATIONS

1. Recommended Amounts

Beneficial Use	Period of Use	Rate of Diversion	Annual Volume
Cooling	01/01 to 12/31	0.50 CFS	99
Heating	01/01 to 12/31	0.50 CFS	99

Totals: **0.50 CFS** **99 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 Christian Stewart, IDWR Water Resource Agent

Field Examiner's Signature Christian J Stewart

Date 12/30/24