

**WATER PERMIT NO. 2775-2**

Name of Applicant: Chace or Leslie Larsen

Address: 23935 Pink Cabin Rd, Hill City SD 57745

Phone: 605 391-7510

Amount of Water Claimed: 0.044 cfs (20 gpm)

Total Acres: NA

Source of Water Supply: groundwater (1 existing well)

Water to be used for: commercial

County: Pennington

Type of Waste Disposal System:

Location: 4 miles east of Hill City

PRIORITY

Date Received: 9-5-17

Application/License Fee: \$ 300

Corrected Application Received:

Period of Annual Use: Jan 1 – Dec 31

Remarks:

Diversion Point: SW 1/4 NW 1/4 Sec 27-T1S-R5E

Land to be Irrigated: NA

Depth of Well: 250 feet

Well Driller:

Remarks:

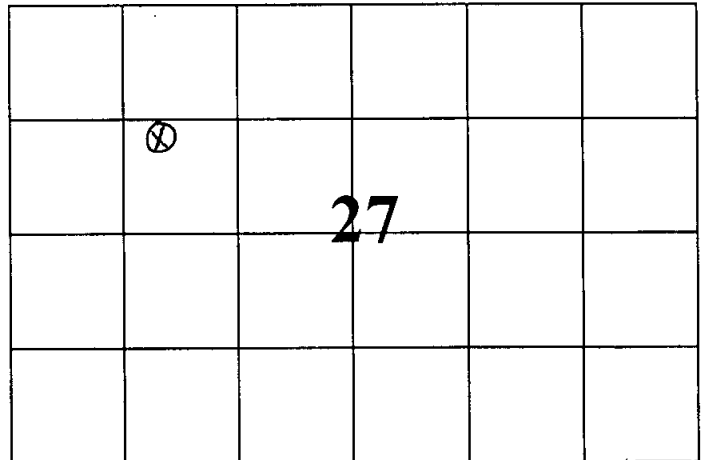
Type of Map: aerial

Prepared by: Steven Quissell

Reviewed and the Number Assigned on: 9-11-17

By: **Karen Schlaak**

Notice of Hearing - date to intervene: \_\_\_\_\_



|                                                                                                               |                                                                        |
|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Mail to: _____<br><br>DENR - Water Rights<br>523 E Capitol Ave<br>Pierre, SD 57501-3182<br>ph. (605) 773-3352 | No. <u>2775-2</u> (office use only)<br>Hydrologic Unit <u>10120109</u> |
|                                                                                                               | Basin <u>Upper Cheyenne</u>                                            |
|                                                                                                               | Newspaper <u>Rapid City Journal</u>                                    |
|                                                                                                               | _____                                                                  |

RECEIVED  
SEP 05 2017  
WATER RIGHTS  
PROGRAM

## Application For Permit To Appropriate Water Within The State Of South Dakota

### Check use(s) of water:

|                                                 |                                                    |                                          |                                        |
|-------------------------------------------------|----------------------------------------------------|------------------------------------------|----------------------------------------|
| <input type="checkbox"/> Municipal              | <input type="checkbox"/> Water Distribution System | <input type="checkbox"/> Recreational    | <input type="checkbox"/> Institutional |
| <input type="checkbox"/> Rural Water System     | <input checked="" type="checkbox"/> Commercial     | <input type="checkbox"/> Fish & Wildlife | <input type="checkbox"/> Geothermal    |
| <input type="checkbox"/> Domestic (over 18 gpm) | <input type="checkbox"/> Industrial                | <input type="checkbox"/> Other _____     |                                        |

### Type of Application:

(check one)

☒ New    ☐ Vested Right (Use predates Mar 2, 1955)    ☐ Future Use Reservation  
☐ Place to Beneficial Use Water Reserved by Future Use Permit No. \_\_\_\_\_  
☐ Amendment/Correction to Permit No. \_\_\_\_\_

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.)

- Name to Appear on Water Permit Chace and Leslie Larsen  
 Mailing Address 23935 Pink Cabin RD Hill City SD 57745  
 (Address) (City) (State) (Zip Code)  
 Phone 605-574-2963 Mobile 605-391-7516 Email freedomridgecabins@gmail.com
- Amount of water claimed 0.044 \*CFS or 20 \*\*GPM and 2.0 \*\*\*AF or \_\_\_\_\_ Gallons  
 Flow rate and volume are both required. (\*Cubic Feet per Second) (\*\*Gallons per Minute) (\*\*\*Acre Feet - storage capacity of dam/dugout or annual use)
- Source of water supply Existing Well (SW 1/4 NW 1/4)
- Location of point of diversion 1 well in NW 1/4 section 27-T001S-R05E County Pennington  
 (example - 3 wells in SW 1/4 NE 1/4 section 12-T104N-R53W)  
 If not a public water supply (e.g. municipal), will water be used outside of the area described above? ☐ Yes ☒ No  
 If "Yes," where will water be used? \_\_\_\_\_  
 (example - NW 1/4 section 12-T104N-R53W)
- County or counties where water will be used Pennington
- Annual period during which water is to be used Home - yearly; Cabins - May through September
- Give a description of the project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)

Building 4 seasonal cabins for nightly rental during the period of ~~April~~ May through September.

I, Chace + Leslie Larsen, the applicant, certify under  
 Name of Person Title (if applicable)

penalty of perjury that I have read this application, examined the attached map, and that the matters stated are true. I further certify, if acting on behalf of an entity or individual other than myself, that I am authorized to submit this application.

**SOUTH DAKOTA**  
**WATER PERMIT NO. 2775-2**

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Date of first receipt of application September 5, 2017.

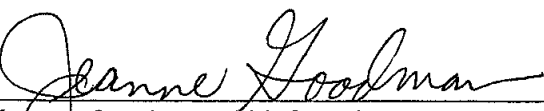
The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 2775-2 to Chace and Leslie Larsen, 23935 Pink Cabin Rd, Hill City SD 57745 authorizing the construction of the water use system and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 2775-2 appropriates 2.0 acre-feet of water annually at a maximum diversion rate of 0.044 cubic feet of water per second (20 gallons per minute) from one existing well completed into the Crystalline Rock Aquifer (250 feet deep) located in the SW 1/4 NW 1/4 Section 27-T1S-R5E located approximately 4 miles east of Hill City SD.
2. The water appropriated shall be used for the purpose of commercial and domestic use and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date of approval of Permit No. 2775-2 is November 20, 2017.
5. The date from which applicant may claim right is September 5, 2017.
6. One-fifth of the construction is to be completed on or before May 20, 2020.
7. All construction is to be completed on or before November 20, 2022.
8. Water is to be put to beneficial use on or before November 20, 2026.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

**QUALIFICATIONS**

1. The well approved under Water Permit No. 2775-2 will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The permit holder shall report to the Chief Engineer annually the amount of water withdrawn from the Crystalline Rock aquifer.
3. Water Permit No. 2775-2 authorizes a total annual diversion of 2.0 acre feet of water.

**WATER MANAGEMENT BOARD**

By:   
Jeanne Goodman, Chief Engineer  
Water Rights Program  
Department of Environment and Natural Resources

DEC 15 2017  
date



## Supplemental Information

(type or print)

### 1. Well Information

(check one or both as applicable)

☐ Drilling new well(s)

☒ Using existing well(s)

a) If new wells, how many \_\_\_\_ Have test holes been drilled ☐ Yes ☐ No Drilled by \_\_\_\_  
(if yes, please provide copies of logs)

b) If existing wells, how many \_\_\_\_ Provide copy of log(s), if available. Drilled by \_\_\_\_

For either Existing or Proposed Wells:

c) Well Depth (required) 250 ft Depth to Top of Water Bearing Material \_\_\_\_ Depth to Water from Surface 65 ft

d) Distance to nearest domestic well on applicant's property 0 Property owned by others 0

### 2. Wastewater Disposal System Information

a) Type of System (i.e. septic tank, drain field) drain field w/ gray water

b) System Capacity (gallons) 2,800 Year Constructed 2017

c) Connected to the City of \_\_\_\_ Sanitary System

### 3. Dugout Information

a) Surface Dimensions \_\_\_\_ Depth \_\_\_\_

b) Depth to water (ground surface to water level) \_\_\_\_

### 4. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to be shown on the map submitted with the application.

a) If a private engineering firm or government agency was involved in the design of this dam, please give their name and address:

b) Freeboard \_\_\_\_

c) Crest Width \_\_\_\_

Crest Length \_\_\_\_

d) Height \_\_\_\_

e) Primary Outlet Capacity \_\_\_\_

If pipe, diameter \_\_\_\_

f) Secondary Spillway Capacity \_\_\_\_

Spillway Width \_\_\_\_

g) X & Y Slope (e.g. 3 to 1 is a typical slope)

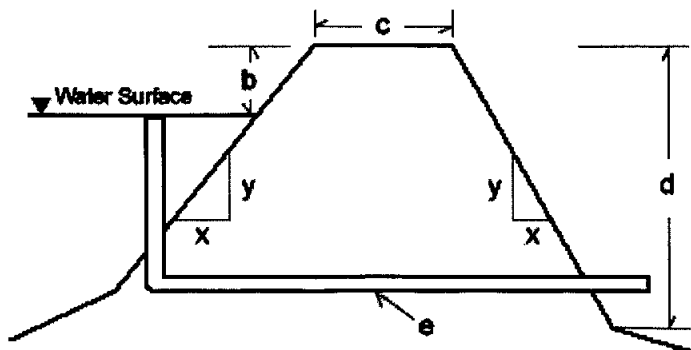
Upstream \_\_\_\_

Downstream \_\_\_\_

h) Surface Area of Impoundment \_\_\_\_

i) Storage \_\_\_\_ Acre Feet

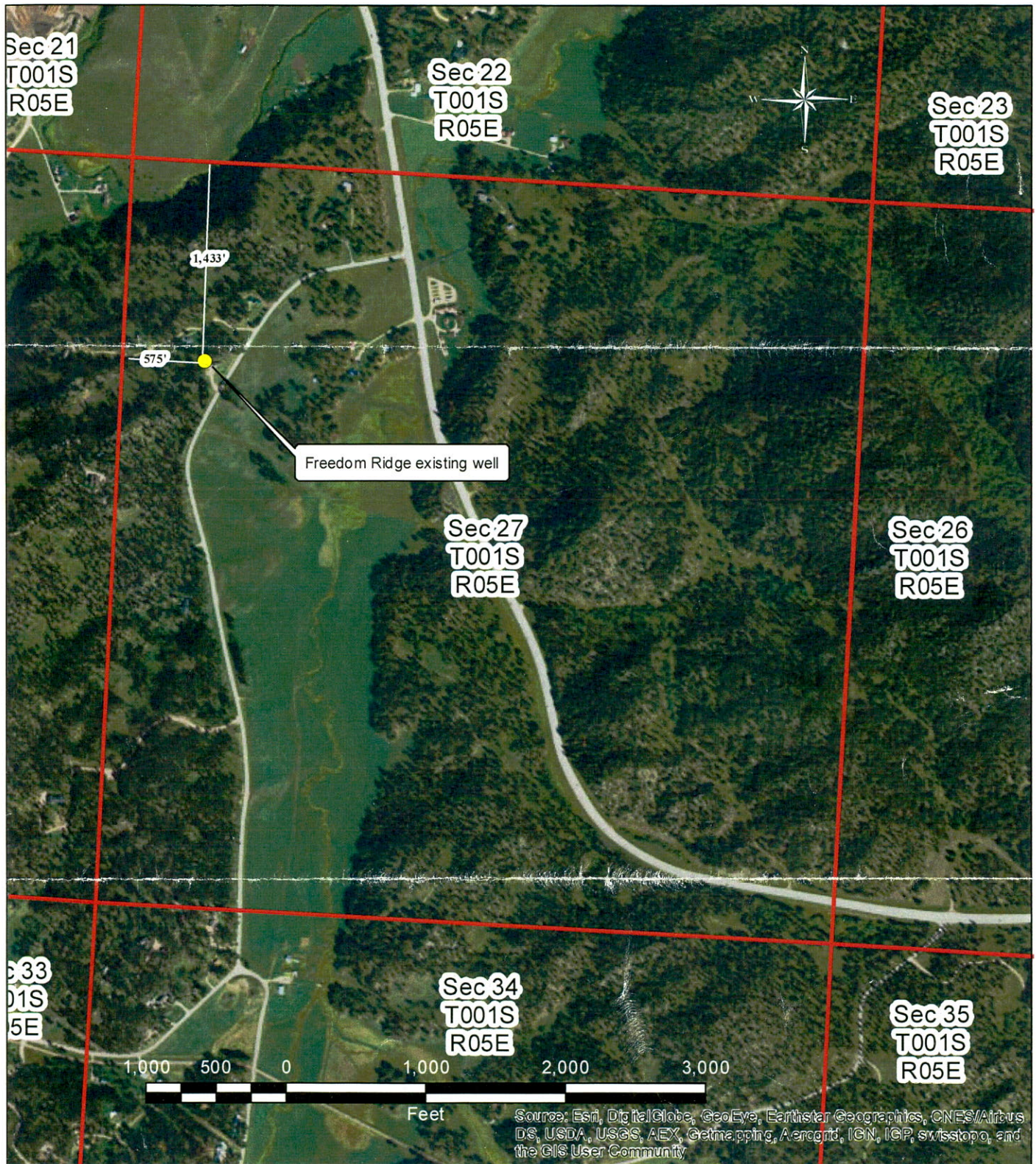
j) Drainage Area Above Dam \_\_\_\_ Acres



# Freedom Ridge Cabins

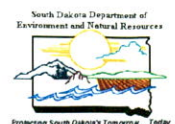
Leslie Larsen

8/16/2017



*Steven Quissell*

Steven Quissell  
Water Rights Inspector  
DENR Water Rights Program



**07-92**

Well Owner: LE ANN NELIN  
Business Name: \_\_\_\_\_  
Address: 23921 Hidden Valley tr  
Reynolds City SD 57745

A 2x2 grid map of a 1-mile square area. The top-left cell contains an 'X' and is labeled 'X' and 'W'. The bottom-right cell is labeled 'E'. A scale bar at the bottom indicates 1 mile.

Well Completion Date

8-15-06

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? 75 ft. from septic tank (identify source).

☒ Domestic/Stock    ☐ Municipal    ☐ Business    ☐ Test Holes  
☐ Irrigation    ☐ Industrial    ☐ Institutional    ☐ Monitoring well

AIR ROTARY

**If other describe**

| PIPEWEIGHT       | DIAMETER    | FROM        | TO           | HOLE DIAMETER   |
|------------------|-------------|-------------|--------------|-----------------|
| <u>180</u> LB/FT | <u>6</u> IN | <u>0</u> FT | <u>30</u> FT | <u>8 3/4</u> IN |
| _____ LB/FT      | _____ IN    | _____ FT    | _____ FT     | _____ IN        |
| _____ LB/FT      | _____ IN    | _____ FT    | _____ FT     | _____ IN        |

| Grout Type | No. of Sacks | Grout Weight | From | To    |
|------------|--------------|--------------|------|-------|
| TYPE III   | 6            | 14.5 lb./gal | 6 ft | 30 ft |
|            |              | lb./gal      | ft   | ft    |

Describe grouting procedure: pumped grout down  
trex tub. from bottom up

Diameter \_\_\_\_\_ IN Length \_\_\_\_\_ FEET

**Material** \_\_\_\_\_

Slot Size \_\_\_\_\_ Set From \_\_\_\_\_ Feet to \_\_\_\_\_ Feet

Other information \_\_\_\_\_

If so, what material? Rubber

Describe packer(s) and location? Flared Rubber 30 ft

**DISINFECTION:** Was well disinfected upon completion?  
 X YES. How: Chlorine Sol

Laboratory sent to for water quality analysis \_\_\_\_\_ NO, Why Not? \_\_\_\_\_

[illegible]

STATIC WATER LEVEL 35 Feet

If flowing: closed in pressure \_\_\_\_\_ PSI

GPM flow \_\_\_\_\_ through \_\_\_\_\_ inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other \_\_\_\_\_

Reduced Flowrate \_\_\_\_\_ GPM

Can well be completely shut in? \_\_\_\_\_

☐ Pumped Describe: Blue with air

☐ Bailed \_\_\_\_\_

☒ Other \_\_\_\_\_

### Pumping Level Below Land Surface

250 ft. After 3 Hrs. pumped 3 GPM

ft. After \_\_\_\_\_ Hrs. pumped \_\_\_\_\_ GPM

If pump installed, pump rate \_\_\_\_\_ GPM

## REMARKS

This well was drilled under license # 171

And this report is true and accurate.

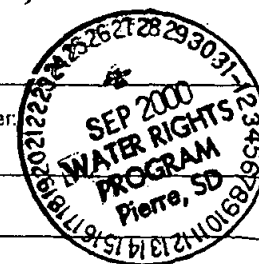
Drilling firm Hama Drilling

Signature of License Representative: \_\_\_\_\_

Paula Hemm

Signature of Well Owner or Equitable Property Holder: \_\_\_\_\_

09 - 01-00



# RECEIPT

## WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date September 5, 2017

RECEIVED OF Freedom Ridge Cabins LLC 23935 Pink Cabin RD Hill City 57745

The following amount in fees for services rendered as provided for by law:

|                                                                                                                |       |        |
|----------------------------------------------------------------------------------------------------------------|-------|--------|
| Fee for Application for Permit No. _____ to Appropriate Water, to construct and to put water to beneficial use | 500   | 00     |
| Fee for Application for Permit No. _____ to Appropriate Water for Future use                                   |       |        |
| Fee to retain Future Use Permit No. _____ after period of seven years.                                         |       |        |
| Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. _____            |       |        |
| Fee for Filing Transfer Form _____                                                                             |       |        |
| Fee for <u>License</u>                                                                                         | 200   | 00     |
| Fee for Issuing New Well Driller's License No. _____ for C.Y. _____                                            |       |        |
| Fee for Renewal of Well Driller's License No. _____ for C.Y. _____                                             |       |        |
| Fee for Issuing Well Pump Installer's License No. _____ for C.Y. _____                                         |       |        |
| Fee for Renewal of Well Pump Installer's License No. _____ for C.Y. _____                                      |       |        |
| (Any Other Work Provided by Law)                                                                               | TOTAL | 700 00 |

No. **08329**

By

Jeanne Goodman  
Chief Engineer *vm*

December 14, 2017

**PAYMENT REQUEST FORM**

**PAYEE:** Chace and Leslie Larsen  
23935 Pink Cabin Rd  
Hill City SD 57745

**FROM:** DENR Water Rights Program  
523 E. Capitol Ave  
Pierre, SD 57501-3181

**DESCRIPTION OF SERVICE, PRODUCE OR TRANSFER**

Refund a portion of the application/license fee submitted September 5, 2017

**AMOUNT:** \$400.00

**FUNDING SOURCE:**

**GENERAL:** X

**FEDERAL:**

**OTHER:**

**COMMENTS:**

**AUTHORIZATION:**



I declare and affirm under the penalties of perjury that this claim is in all things, true and correct. I further agree to comply with the provisions of the Civil Rights Act of 1964 and regulations issued thereunder relating to nondiscrimination in federal assisted programs.

Water Rights Program - DENR  
Conversation File Documentation

NAME OF PERSON OR FILE: Chace and Leslie Larsen application

ADDRESS: COUNTY: PenningtonCounty

DATE: September 13, 2017 TELEPHONE:

RE: call from Leslie Larsen in response to my September 11<sup>th</sup> email

In response to my email, Mrs. Larsen called.

1. Just making sure we have the right address – 23935 Pink Cabin Rd, Hill City SD 57745. Is that correct?

Yes this is the correct address

2. Do you have any idea of the year the well was drilled? Who was the well driller? And who was the owner of the property at the time it was completed?

Mrs. Larsen contacted Alexander drilling her she thinks drilled the well but it not sure. She will get back to me if she finds out anything.

3. Application requests a 20 gallons per minute pump rate. The well is to be use for the home year round and cabins May – September. Please provide an estimate of the yearly volume in gallons that will be pumped for all intended purposes. Be reasonable but estimate on the high side.

Mrs. Larsen did not know where to start regarding the annual volume to be used. With my assistance she requested an annual volume of 2.0 acre feet annually recognizing this would be on the high side. The rationale is:

Up to 400 gallons per day (gpd) for the year round home = 146,000 gallons year  
The cabins do not have lawns so used 200 gpd per cabin and are in use five month each year.  
200 gpd x 4 cabins for 5 months = 121,666 gallons per year.  
Total is 267,666 gallons per year which equals 0.82 acre feet of water annually.

For future growth potential, Mrs. Larsen asked that the application be amended to reflect up to 2 acre feet annually.

NAME: Eric Thompson



**DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES**

JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE SOUTH DAKOTA 57501-3182  
<http://denr.sd.gov>

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT  
APPLICATION NO. 2775-2, Chace and Leslie Larsen**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 2775-2, Chace and Leslie Larsen, 23935 Pink Cabin Road, Hill City SD 57745.

The Chief Engineer is recommending APPROVAL of Application No. 2775-2 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) it is in the public interest with the following qualifications:

1. The well approved under Water Permit No. 2775-2 will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The permit holder shall report to the Chief Engineer annually the amount of water withdrawn from the Crystalline Rock aquifer.
3. Water Permit No. 2775-2 authorizes a total annual diversion of 2.0 acre feet of water.

See report on application for additional information.

Jeanne Goodman, Chief Engineer  
November 1, 2017

NOTE: Please read "Special Consideration" section on page 7 of the report regarding the potential need to regularly test the water for mercury.

REPORT TO THE CHIEF ENGINEER  
ON  
WATER PERMIT APPLICATION NO. 2775-2  
CHACE OR LESLIE LARSEN  
OCTOBER 31, 2017

Water Permit Application No. 2775-2 proposes to appropriate 2.0 acre-feet (ac-ft) of water annually at a maximum diversion rate of 0.044 cubic feet of water per second (cfs) (20 gallons per minute) from one existing well (250 feet deep) completed into the Crystalline Rock aquifer located in the SW ¼ NW ¼ Sec. 27-T1S-R5E for commercial use. The well location is approximately four miles east of Hill City, SD in Pennington County.

**AQUIFER: Crystalline Rock (CRSL)**

**Aquifer Characteristics:**

The well this application proposes to use is completed into Precambrian aged crystalline rock. Precambrian aged crystalline rock comprises the core of the Black Hills. The DENR-Water Rights Program calls the aquifer that the well this application proposes to use the Crystalline Rock aquifer. At the well site, the rock is primarily metagraywacke (Redden and Uzunlar, 2017; Martin et. al, 2004). Harney Peak Granite intrusives have also been identified in this area (Redden and Uzunlar, 2017). In the floodplains of Palmer and Spring Creeks in the area of the well site, the crystalline rocks are often mantled by alluvium (Redden and Uzunlar, 2017; Martin et. al, 2004). Crystalline rock can be found throughout South Dakota. However, wells completed into the crystalline rock outside the Black Hills region rarely encounter measureable amounts of groundwater (Driscoll and Carter, 2001). It is not considered as one single aquifer, but rather as numerous localized aquifers where extensive fractures and weathered zones allow for the transmission of water (Driscoll and Carter, 2001). Water derived from a well completed into the crystalline rock is almost exclusively from the joints, fractures, foliation, and faults, called secondary porosity, within the rock because the crystalline rocks have low primary porosities (Rahn, 1979). Therefore, the availability of water in the aquifer is site specific and depends upon the occurrence of secondary porosity at any given site.

The structural geology of the area is complex. The St. Elmo Thrust Fault has been inferred to run adjacent to the well site; the China Gulch Fault is inferred to be approximately one-half mile north of the well site; and the Golden Slipper silicified breccia zone is approximately one-half mile east of the well site (Redden and Uzunlar, 2017). Furthermore, the crest of the Summit Peak anticline is inferred or projected to be within three-quarters of a mile west of the well site (Redden and Uzunlar, 2017). The potential effects, if any, of these geologic structures on the groundwater hydrology of the area are unknown.

The well completion report submitted with this application identified top soil from ground surface to three feet below grade, and mica schist from 3 feet to 250 feet below grade. The static water level at the time of drilling in August 2000 was 35 feet below ground surface. The mica schist identified on the well completion report is one of several terms used by local well drillers to identify Precambrian aged crystalline rock throughout the Black Hills.

## **SOUTH DAKOTA CODIFIED LAW (SDCL) 46-2A-9**

Pursuant to SDCL 46-2A-9, a permit to appropriate water may be issued only if there is a reasonable probability that there is unappropriated water available for this applicant's proposed use, that the proposed diversion can be developed without unlawful impairment of existing rights and that the proposed use is a beneficial use and in the public interest. This report will address the availability of unappropriated water and effects on existing rights from the aquifer that are pertinent to this application.

### **WATER AVAILABILITY:**

This application proposes to appropriate water from the Crystalline Rock aquifer. The probability of unappropriated water available from the aquifer can be evaluated by considering SDCL 46-6-3.1, which requires "No application to appropriate groundwater may be approved if, according to the best information reasonably available, it is probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of water to the groundwater source." If the source of the water is older or stratigraphically lower than the Greenhorn Formation and a water distribution system has applied for a permit, the Board need not consider the recharge/withdrawal issue. While the aquifer is older than the Greenhorn Formation, the applicant is not a water distribution system. Therefore, the issue of recharge and discharge needs to be considered.

As previously stated the Crystalline Rock aquifer is not a single aquifer of regional size, but rather numerous localized aquifers. Recharge to the localized crystalline rock aquifers occurs through infiltration of precipitation falling on the outcrop and any secondary porosity that is present at land surface as well as through streamflow losses when the stages of area streams are higher than groundwater levels. Driscoll and Carter (2001) estimated recharge to the Crystalline Rock aquifers to be equal to withdrawals at the time (3,600 ac-ft/yr). However, it was noted that actual recharge to the aquifers must be much larger than estimated to account for discharge to streams and evapotranspiration. Driscoll and Carter (2001) stated for crystalline rock aquifers, "Recharge conditions are highly transient and have large spatial variability; thus, quantification is not attempted." Additionally, there is insufficient data available to attempt delineation of the localized Crystalline Rock aquifers within the core area of the Black Hills. Therefore, there are no estimates of either average annual recharge to or an average annual withdrawal from the localized aquifer the applicant proposes to use.

### **Observation Well Data:**

Administrative Rule of South Dakota Section 74:02:05:07 requires that the Water Management Board shall rely upon the record of observation well measurements in addition to other data to determine that the quantity of water withdrawn annually from the aquifer does not exceed the estimated average annual recharge of the aquifer.

The DENR-Water Rights Program monitors three observation wells completed into the Crystalline Rock aquifer with two located in the Black Hills and one located in Grant County (Water Rights, 2017a). The Crystalline Rock aquifer is very site specific so these observation wells do not describe the local characteristics of the aquifer. However, the hydrographs for the observation wells can provide information related to general aquifer characteristics.

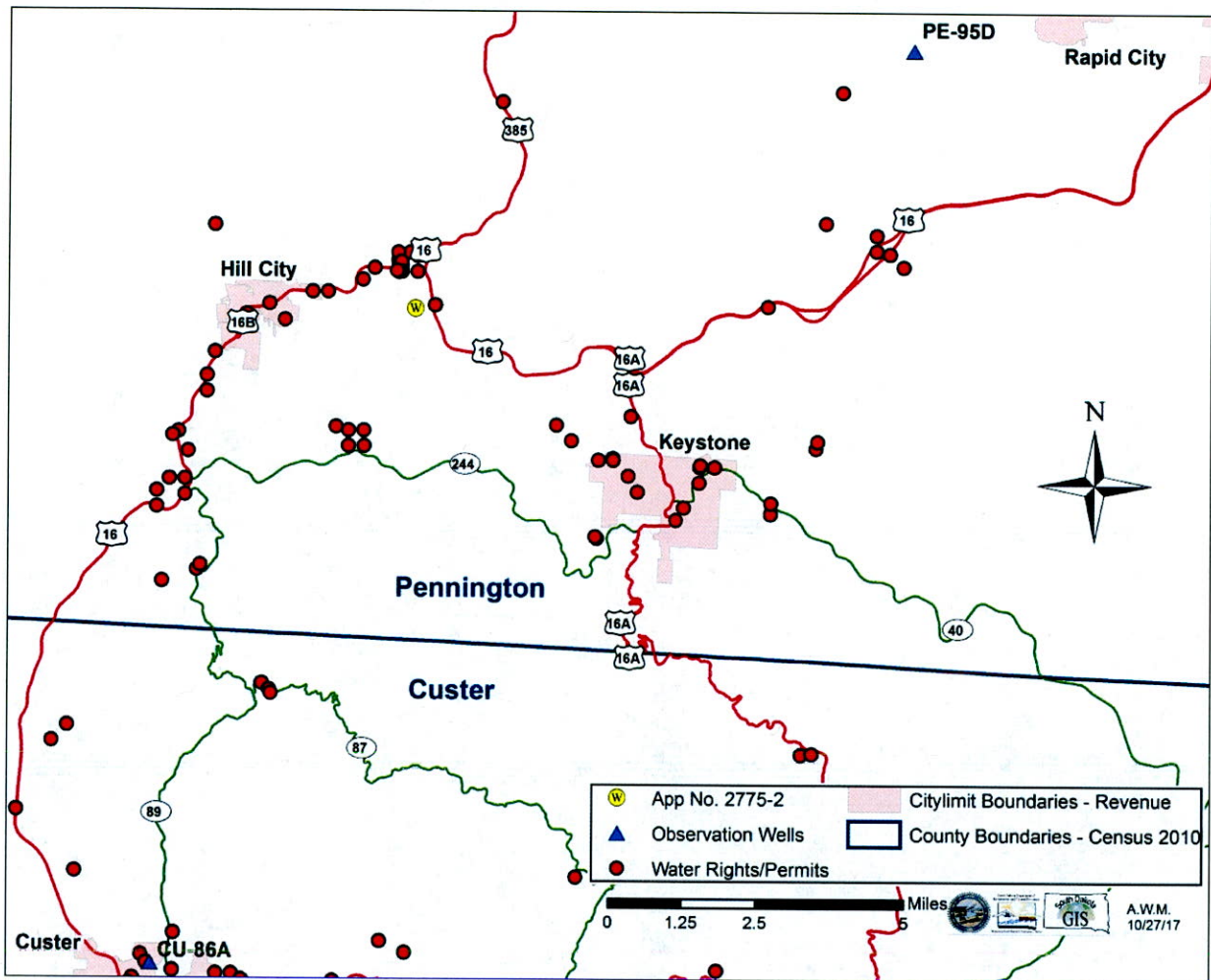


Figure 1- Map of Crystalline Rock aquifer water rights/permits (Water Rights, 2017b), observation wells (Water Rights, 2017a), and the well Application No. 2775-2 proposes to use

Observation wells PE-95D and CU-86A are located approximately 9.5 miles northeast and 11.9 miles south-southwest of the well the applicant proposes to use, respectively (Water Rights, 2017a). Observation well PE-95D is completed into the Crystalline Rock aquifer that is overlain by the Madison and Deadwood Formations. Observation well CU-86A is completed into the outcrop of the Crystalline Rock aquifer which is a similar geologic situation as the well this application proposes to use. Therefore, it is expected that CU-86A would be more reflective of the Crystalline Rock aquifer at the well site for this application than PE-95D. Figure 1 is a map showing the location of the well this application proposes to use, observation wells PE-95D and CU-86A, and water rights/permits authorized to withdraw water from the Crystalline Rock aquifer. Figures 2 and 3 are the hydrographs for CU-86A and PE-95D, respectively. Observation well PE-95D had a blockage in the well in 2011 and again in 2016. The presence and removal of the obstructions has caused the low points of the water level record shown in the hydrograph for PE-95D that are not likely representative of the Crystalline Rock aquifer.

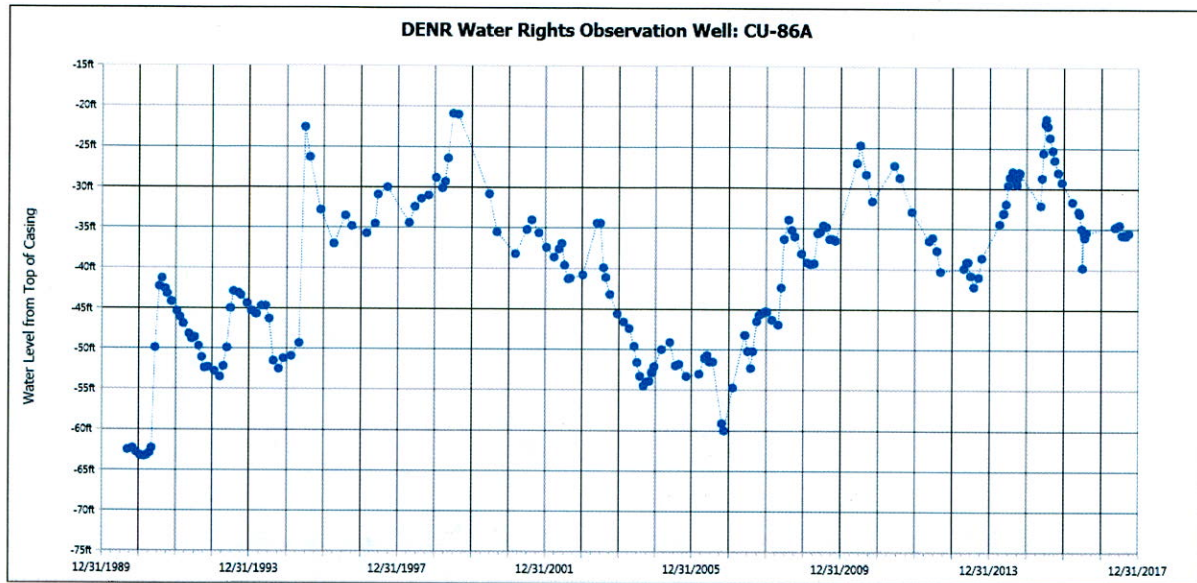


Figure 2- Hydrograph for CU-86A (Water Rights, 2017a)

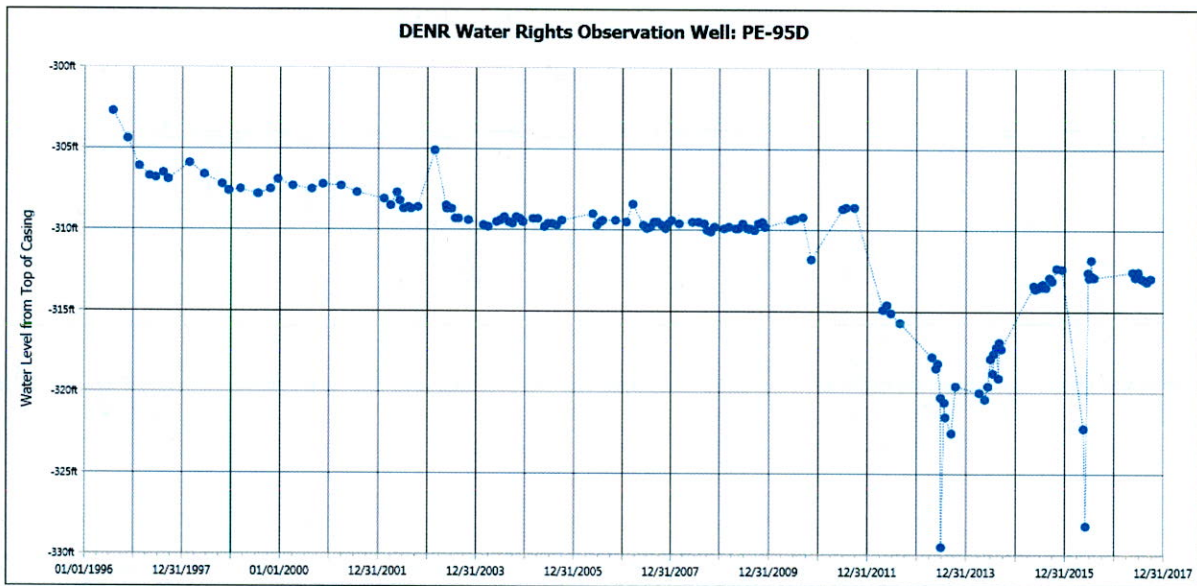


Figure 3- Hydrograph for PE-95D (Water Rights, 2017a)

The hydrograph for CU-86A shows the water level in the observation well responds to climatic conditions; rising during wet periods and slowly declining during drier periods. The hydrograph does not show the impacts of pumping affecting the water level even though the observation well is within approximately one-half mile of six appropriative wells (Water Rights, 2017b). Therefore, climatic conditions mask any impacts to the water level that may be caused by localized pumping. When climatic conditions dominate changes in water level, recharge to and natural discharge from an aquifer greatly exceed pumping. Natural discharge from an aquifer can be captured for well withdrawals. The climatic conditions at CU-86A and the well site this application proposes to use are expected to be similar. While the hydrograph for CU-86A cannot show exactly what is happening at the well this application proposes to use, it shows that climatic conditions dominate the water level of an observation well that is in close proximity to

several appropriative users. The well this application proposes to use is in a similar hydrogeologic and climatic situation as CU-86A. Therefore, this proposed appropriation is not expected to cause withdrawals to exceed recharge in the area of the well site.

**EXISTING WATER RIGHTS:**

There are a number of domestic and appropriative wells completed into the Crystalline Rock aquifer in this area (Water Rights, 2017b and 2017c). Figure 4 is a map showing all of the water rights/permits in the vicinity of the well this application proposes to use (Water Rights, 2017b). Table 1 is a list of the water rights shown in Figure 4.

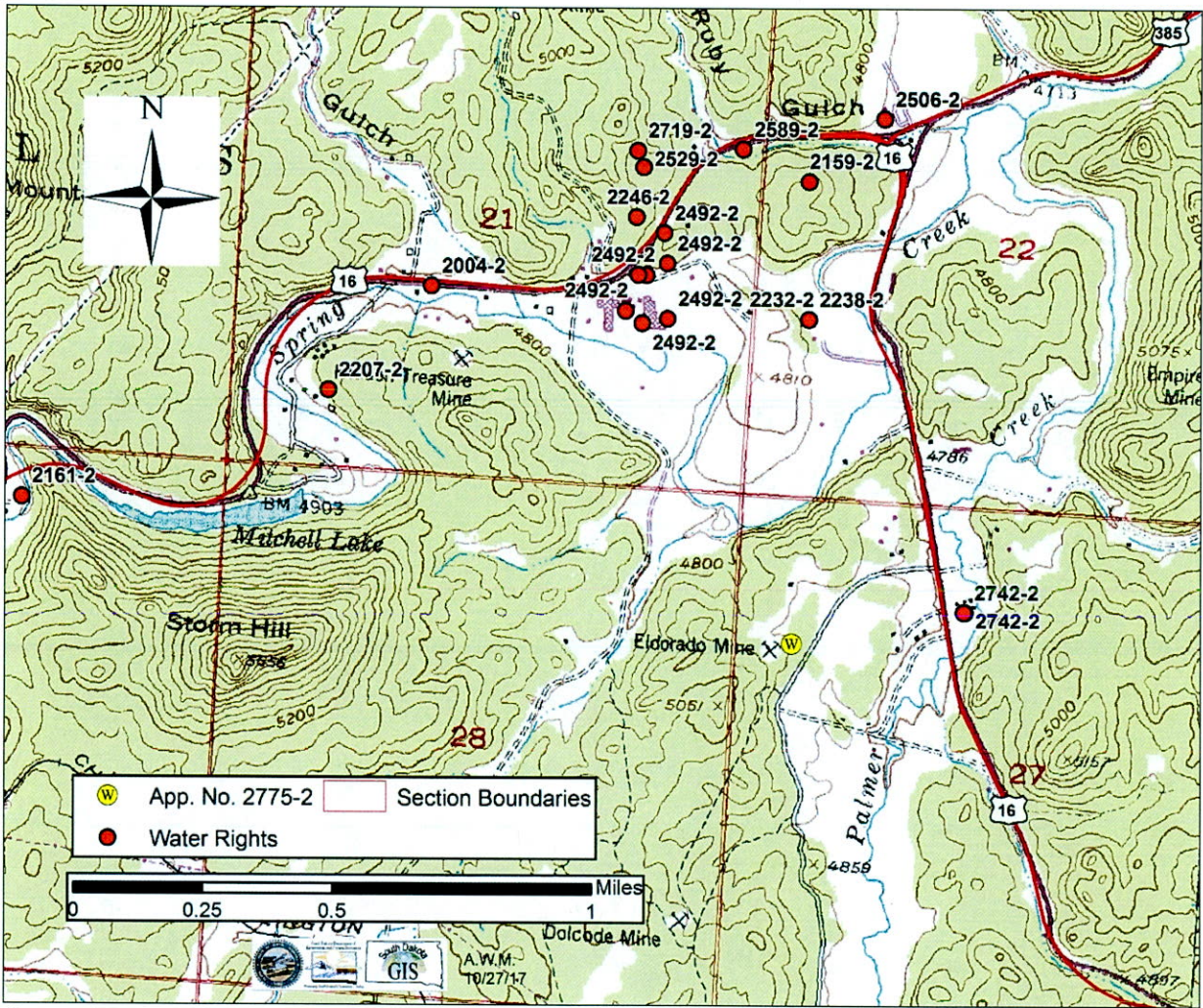


Figure 4- Map of water rights in the area of the well site Application No. 2775-2 proposes to use (Water Rights, 2017b)

Table 1- Water rights shown in Figure 4 (Water Rights, 2017b)

| Permit No.                                                       | Name                       | Status | Use     | CFS   |
|------------------------------------------------------------------|----------------------------|--------|---------|-------|
| 2004-2                                                           | Gustave A Orloske          | LC     | COM     | 0.02  |
| 2159-2                                                           | Daisey Enterprise LLC      | LC     | COM     | 0.07  |
| 2161-2                                                           | Lode Stone Motel           | LC     | COM/DOM | 0.017 |
| 2207-2                                                           | Robins Roost Cabins        | LC     | COM     | 0.02  |
| 2232-2                                                           | Mountain View Lodge        | LC     | COM     | 0.034 |
| 2238-2                                                           | Larry & Karen Moore        | LC     | COM/DOM | 0.022 |
| 2246-2                                                           | Gordon W Collins           | LC     | COM     | 0.022 |
| 2492-2                                                           | Rushmore Forest Products   | LC     | IND/DOM | 0.52  |
| 2506-2                                                           | Daisey Enterprise LLC      | LC     | COM     | 0.01  |
| 2529-2                                                           | Prairie Berry LLC          | LC     | COM     | 0.056 |
| 2589-2                                                           | Rolland and Dawnette Owens | LC     | COM     | 0.022 |
| 2719-2                                                           | Prairie Berry LLC          | LC     | COM     | 0.06  |
| 2742-2                                                           | Voorhees Hospitality LLC   | LC     | COM/DOM | 0.056 |
| LC= Water Right, COM= Commercial, DOM= Domestic, IND= Industrial |                            |        |         |       |

The relatively low pump rate this application proposes is not expected to result in significant drawdown. The drawdown that would result for pumping this proposed diversion is dependent on the site specific characteristics of the Crystalline Rock aquifer in the immediate vicinity of the well bore. Since porosity of the aquifer is small, 0.03-0.10 (Driscoll et. al, 2002), drawdown created by pumping a well can extend some distance from the well. Since the movement of water through the crystalline rock aquifer is dependent on secondary porosity, the shape and depth of the drawdown “cone” created by pumping a well is not necessarily dependent on distance between wells. Determining the precise drawdown effects at the well this application proposes to use would require aquifer testing. It is possible drawdown created by pumping under this could be measurable in nearby wells. However, interference is not expected to be significant to an adequate well considering the small diversion rate proposed.

An adequate well has been defined in Administrative Rule of South Dakota (ARSD) 74:02:04:20(6) as:

“a well constructed or rehabilitated to allow various withdrawal methods to be used, to allow the inlet to the pump to be placed not less than 20 feet into the saturated aquifer or formation material when the well is constructed, or to allow the pump to be placed as near to the bottom of the aquifer as is practical if the aquifer thickness is less than 20 feet”.

The Water Management Board has previously considered the effects of pumping on water levels in nearby wells and has promulgated rules to place water to maximum beneficial use. The Water Management Board has defined an “adversely impacted domestic well” in ARSD 74:02:04:20(7) as:

“a well in which the pump intake was set at least 20 feet below the top of the aquifer at the time of construction or, if the aquifer is less than 20 feet thick, is as near to the bottom of the aquifer as is practical and the water level of the aquifer has declined to a level that the pump will no longer deliver sufficient water for the well owner’s needs”.

In the past, the Water Management Board has recognized to place water to maximum beneficial use, a certain amount of drawdown may occur. Since the porosity of the Crystalline Rock aquifer is so small, 20 feet of saturated thickness may not be adequate for a well to be a reliable water supply. This means that in this hydrogeologic setting, wells that are "adequate" by definition may not be a reliable water supply. It can be argued that any measurable drawdown in one well that was created by pumping a different well is an adverse impact. However, the natural water level fluctuations of nearly 45 feet as shown in the hydrograph for CU-86A demonstrate that a drawdown of a few feet should be considered insignificant. Considering all of this information, there is a reasonable probability this proposed diversion can be pumped without unlawfully impacting existing appropriative or domestic users.

#### **SPECIAL CONSIDERATION:**

The well this application proposes to use is within approximately 1,000 feet of the former El Dorado mine shafts and amalgamation mill. The El Dorado mine produced gold, silver, tungsten, and tin (Bureau of Mines, 1955). Historically, mercury was used in the processing of ore to retrieve gold at amalgamation mills. The presence of an amalgamation mill for ore processing means there is a potential for mercury to be present and migrate toward the well the applicant proposes to use. However, since this well has been in use for some time without apparent incident, it is not likely to become an issue. Community and non-transient, non-community public water systems are required to sample for mercury every three years (40 CFR § 141.23 (c)(1) (1996)). This proposed appropriation would not be a public water system and would not be required to sample and test for mercury. However, out of an abundance of caution, the applicant should consider regularly testing the water for mercury. If mercury is present in the water in-home treatment options, such as reverse osmosis, are available to remove the mercury.

#### **CONCLUSIONS:**

1. Application No. 2775-2 proposes to appropriate 2.0 ac-ft/yr. at a maximum instantaneous diversion rate of 0.044 cfs from the Crystalline Rock aquifer for commercial and domestic purposes.
2. Average annual recharge to the local crystalline rock aquifer has not been quantified. However based on the best information reasonably available (observation well data), there is a reasonable probability unappropriated water is available for this proposed appropriation.
3. There is a reasonable probability the diversion proposed by this application can be made without adversely impacting existing appropriative or domestic users.
4. Due to the presence of the former El Dorado mine and the amalgamation mill constructed to process gold ore at the mine, the water from the well should be regularly tested for mercury.



Adam Mathiowetz, PE  
SD DENR-Water Rights Program

**REFERENCES:**

- 40 CFR § 141.23 (c)(1). July 1, 1996. U.S. Government Publishing Office Accessed: October 31, 2017. <<https://www.gpo.gov/fdsys/pkg/CFR-1996-title40-vol10/pdf/CFR-1996-title40-vol10-sec141-23.pdf>>.
- Bureau of Mines. 1955, Black Hills Mineral Atlas, South Dakota Part 2 (In Two Parts). Information Circular 7707. Prepared by Bureau of Mines Staff, Region V. U.S. Department of the Interior.
- Driscoll, D. G. and Carter, J.M. 2001. Hydrologic Conditions and Budgets for the Black Hills of South Dakota, through Water Year 1998. Water-Resources Investigations Report 01-4226. U.S. Geological Survey. Rapid City, South Dakota.
- Driscoll, D. G., Carter, J.M., Williamson, J.E. and Putnam, L.D. 2002. Hydrology of the Black Hills Area, South Dakota. Water-Resources Investigations Report 2002-4094. U.S. Geological Survey. Rapid City, South Dakota.
- Martin, J.E., Sawyer, J.F., Fahrenbach, M.D., Tomhave, D.W., and Schulz, L.D. 2004. Geologic Map of South Dakota. General Map 10. Scale: SD DENR-Geological Survey. Vermillion, South Dakota.
- Rahn, P.H. 1979. Ground Water Resources of Western South Dakota. South Dakota School of Mines and Technology Project #2533. Rapid City, South Dakota.
- Redden, J.A. and Uzunlar, N. 2017. Geologic Map of the Hill City Quadrangle. 7.5 Minute Series Geologic Quadrangle Map 23. Scale 1:24,000. SD DENR-Geological Survey, Vermillion, South Dakota.
- Water Rights. 2017a. Observation Well Files. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.
- Water Rights. 2017b. Water Right/Permit Files. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.
- Water Rights. 2017c. Well Completion Reports. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.



DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES

JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

**NOTE: TO BE SURE OF PUBLICATION ON  
THE CORRECT DATES, CONTACT  
THE NEWSPAPER RIGHT AWAY.**

November 1, 2017

Chace and Leslie Larsen  
23935 Pink Cabin Rd  
Hill City SD 57745

Dear Mr. & Mrs. Larsen:

Water Permit Application No. 2775-2 for commercial and domestic use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Rapid City Journal (Ph # 605-394-8300). You will need to contact the newspaper and authorize publication of this notice. For your information, a copy of the notice, the recommendation of the Chief Engineer and report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

Be sure to contact the above newspaper to authorize publication of your Notice and to arrange for payment. Early contact with the paper can eliminate delays. Upon receiving authorization from you, the publisher has been instructed to publish your notice. The newspaper has also been instructed to send us the Proof of Publication. We must receive Proof of Publication before action can be taken on the application.

Sincerely,

Eric Gronlund  
Natural Resources Engineer  
(605) 773-3352

enclosures

NOTE: If you plan to contest any part of the Chief Engineer's recommendation, you must file a petition pursuant to the procedures outlined in the attached notice of hearing. The Water Management Board will then consider your concerns during a hearing on the application.

Instruction to Newspaper - Publish the Notice on November 10, 2017. The applicant is responsible for payment.

---

NOTICE OF APPLICATION NO. 2775-2 to Appropriate Water

Notice is given that Chace and Leslie Larsen, 23935 Pink Cabin Rd, Hill City SD 57745 have filed an application for a water permit to appropriate 2.0 acre-feet of water annually at a maximum diversion rate of 0.044 cubic feet of water per second (20 gallons per minute) from one existing well completed into the Crystalline Rock Aquifer (250 feet deep) located in the SW 1/4 NW 1/4 Section 27-T1S-R5E for commercial and domestic use located approximately 4 miles east of Hill City SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 2775-2 with qualifications because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. The Chief Engineer's recommendation with qualifications, the application, and staff report are available at <http://denr.sd.gov/public> or contact Eric Gronlund for this information, or other information, at the Water Rights Program address provided below.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by November 20, 2017.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

If the applicant does not contest the recommendation of the Chief Engineer and no petition to oppose the application is received, the Chief Engineer shall act on the application pursuant to the recommendation with no hearing held before the Water Management Board. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Steven M. Pirner, Secretary, Department of Environment and Natural Resources. Published once at the total approximate cost of\_\_\_\_\_.

# Affidavit of Publication

RECEIVED

NOV 17 2017

WATER RIGHTS  
PROGRAM

STATE OF SOUTH DAKOTA

County of Pennington

SS:

Nov 10 L21064733

## NOTICE OF APPLICATION NO. 2775-2 to Appropriate Water

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Steven M Pirner,  
Secretary  
Department of Environment  
and Natural Resources

(Published once at the total approximate  
cost of \$60.55)

Sheri Sponder being first duly sworn, upon his/her oath says: That he/she is now and was at all time hereinafter mentioned, an employee of the RAPID CITY JOURNAL, a corporation of Rapid City, South Dakota, the owner and publisher of the RAPID CITY JOURNAL, a legal and daily newspaper printed and published in Rapid City, in said County of Pennington, and has full and personal knowledge of all the facts herein stated as follows: that said newspaper is and at all of the times herein mentioned has been a legal and daily newspaper with a bonafide paid circulation of at least Two Hundred copies daily, and has been printed and published in the English language, at and within an office maintained by the owner and publisher thereof, at Rapid City, in said Pennington County, and has been admitted to the United States mail under the second class mailing privilege for at least one year prior to the publication herein mentioned; that the advertisement, a printed copy of which, taken from said Rapid City Journal, the paper in which the same was published, is attached to this sheet and made a part of this affidavit, was published in said paper once each day for one successive day, the first publication there of being on the 10th day of Nov 2017 that the fees charged for the publication there of are 60 dollars and 55 cents.

Sheri Sponder

Subscribed and sworn to before me this 15th  
day of November, 2017.

Dustin Rice

Notary public

DUSTIN RICE



NOTARY PUBLIC  
SOUTH DAKOTA



7/1/20

My commission expires

## Schlaak, Karen

---

**From:** Schlaak, Karen  
**Sent:** Wednesday, November 01, 2017 9:25 AM  
**To:** RCY Legals (legals@rapidcityjournal.com)  
**Subject:** 2775-2, Chace and Leslie Larsen  
**Attachments:** 2775-2public.short.docx; FORM8.FRM.doc

Attached is a notice to be published on November 10, 2017.

Chace and Leslie Larsen, 23935 Pink Cabin Rd, Hill City SD 57745 (605 574-2963 or c 605 391-7510) has been notified to contact you to authorize publication and arrange for payment.

Please send the affidavit or return the attached Proof of Publication form ASAP to the Water Rights Program, 523 E Capitol, Pierre SD 57501.

Let me know if you have questions. Please acknowledge receipt of this email.

*Karen Schlaak*  
SD DENR, Water Rights Program  
(605) 773-3352





DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES

JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

DEC 15 2017

Chace and Leslie Larsen  
23935 Pink Cabin Rd  
Hill City SD 57745

Dear Mr. & Mrs. Larsen:

Enclosed is Water Permit No. 2775-2 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

The application was submitted with a fee of \$700.00. The application /license fee for Permit No. 2775-2 is \$300.00. Therefore, \$400.00 will be refunded to you. The refund check should be received within a couple of weeks.

A Form 10, *Notice of Completion of Works and Application of Water to Beneficial Use*, is enclosed. Please return this completed form after you have finished the system and have put the water to beneficial use. An investigation can then be scheduled so the water license may be issued, thus completing the acquisition of a water right.

An information sheet *Common Water Right Questions* is also enclosed. This sheet is intended to answer some of the questions associated with obtaining and keeping a water right.

Sincerely,

Jeanne Goodman, Chief Engineer  
Water Rights Program  
605 773-3352

enclosures

2775-2

SD EForm - 1311LD V1

Form 10

# **NOTICE OF COMPLETION OF WORKS AND APPLICATION OF WATER TO BENEFICIAL USE**

MAIL TO: PMB 2020

Date

6/28/2018

DENR - Water Rights Program

523 E Capitol Ave

Pierre, SD 57501-3182

ph. (605) 773-3352

FROM:

Chace Larsen

(name)

23935 Pink Cabin Rd

(address)

Hill City

(city)

S.D.

(state)

57745

(zip)

605-574-2963

(phone)

I have completed the construction of the water use system and I have put the water to beneficial use to the maximum extent it is going to be used.

Water Permit No. 2775-2 states that the water use system is to be constructed by4/20/2022

(date)

, and water is to be put to beneficial use by

11/20/2026

(date)

The water use system was completed on

x ~~31 Aug 2017~~ 27 May 2018

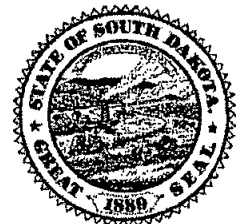
(date)

Applying the water to beneficial use was completed on

x 27 May 2018

(date)

You may schedule an investigation so that the water license may be issued.

Chace Larsenx [Signature]

## Report of Examination of Works and/or Application of Water to Beneficial Use For Permit No. 2775-2

I have this day, **June 28, 2018** made a thorough examination of the water use system constructed by **Chace or Leslie Larsen, 23935 Pink Cabin Rd, Hill City, SD 57745** of Permit No. **2775-2**, bearing the priority of **9/5/2017** authorizing the diversion of **.044** cu. ft. per second of the water from one well for **commercial and domestic** purposes in **Pennington** County.

Inspection contact & relationship to permit holder, if applicable:

**Chace Larsen, owner**  
**freedomridgecabins@gmail.com**  
**605-574-2963**

### A. Works used to divert the water:

#### Well Information:

- 1) Well Drilling Firm: Hamm Drilling (8/2000)
- 2) No. of Wells 1
- 3) Depth(s) 250 feet
- 4) Well log is available Yes

#### Casing:

- 1) Diameter 6"
- 2) Length 30 feet
- 3) Type PVC

#### Screen:

- 1) Type open hole
- 2) Length 220 feet
- 3) Static water level 35 feet

#### Pump:

- 1) Make F&W
- 2) Model 4F10S10
- 3) Size 4"
- 4) Capacity 14 GPM (This is a 10 gpm pump producing 14 gpm as installed)
- 5) Horsepower rating 1 hp

**B. Works used to transport water to place of use:**

The well pumps to a nearby pressure tank with a 40-60 psi setting and then to nearby cabins and the owners home through 1" PE pipe.

**C. Works used to apply water to beneficial use:**

The well serves the owners living quarters and four rental cabins for Freedom Ridge Cabins.

**D. Compliance with Permit Requirements:**

- 1) Permit qualifications being abided by: Yes,
- 2) Exceptions to compliance are: none

**E. Condition and Location:**

The system is in good condition . The diversion point is located as follows:

**1,393' S and 631' E of the NW corner Section 27 T1S R5E (43.936898, -103.516197)**

1. The works are capable of diverting and conveying to the place of use .031 cu. ft. per second (14 gpm) of water which is to be used for **commercial and domestic** use and the license should be issued for .031cfs.
2. All structures, wells and lands on map: **Well only**

**F. Comments or other permit(s) associated with the project: none**



Steven Quissell  
Water Rights Inspector  
DENR, Water Rights Program

Date report completed: 6/28/2018

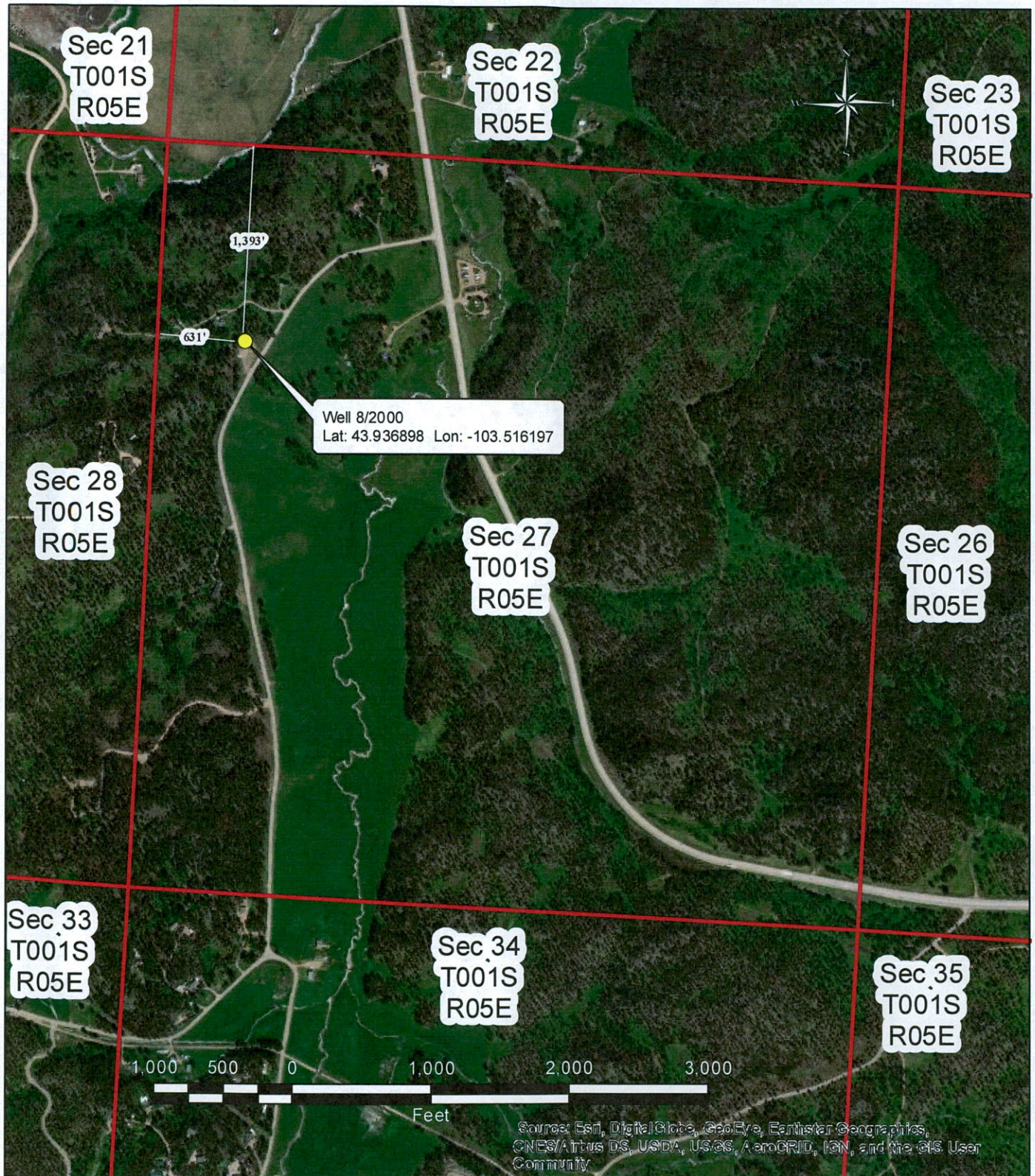


Well in foreground



Freedom Ridge Cabins

Water Right #2775-2  
Chace or Leslie Larsen  
6/28/2018



Steven Quissell  
Water Rights Inspector  
DENR Water Rights Program





DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES

JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE SOUTH DAKOTA 57501-3182  
<http://denr.sd.gov>

SEP 26 2018

2775-2

Chace & Leslie Larsen  
23935 Pink Cabin Rd  
Hill City SD 57745

Dear Mr. & Mrs. Larsen:

Enclosed is Water License No. 2775-2. This is the final water right document completing your process of obtaining a Water Right. Included with your license is a map prepared by the staff engineer who conducted the field investigation.

For your information SDCL 46-6-27 requires that if in the future, the owner of an existing well, constructs a replacement well and does not plan to use the old well, the old well is considered abandoned and must be plugged. Also, any well that is being used or is not considered abandoned must be valved and controlled, if flowing, or sealed and capped so that no leaking occurs either underground or at the surface.

As long as you use the water beneficially, as stated in the Water License, the State Water Laws provide that you have a continuing right to use the water. If you have any questions, please contact our office.

Sincerely,

Jeanne Goodman, Chief Engineer  
Water Rights Program  
(605) 773-3352

enclosures

**STATE OF SOUTH DAKOTA  
WATER LICENSE NO. 2775-2**

---

(1) Chace and Leslie Larsen, 23935 Pink Cabin Rd., Hill City SD 57745 made Application No. 2775-2, September 5, 2017 for a water permit to divert 0.044 cubic feet of water per second from ground water, one well (Crystalline Rock), Pennington County, South Dakota for commercial and domestic purposes. Permit No. 2775-2, with a priority date of September 5, 2017 was approved November 20, 2017 and issued to the applicants for diversion of water with construction of the described water supply system to be completed on or before November 20, 2022 and for the application to beneficial use of water on or before November 20, 2026.

The Permit holder submitted a "*Notice of Completion of Works and Application of Water to Beneficial Use*" on June 28, 2018. The "*Notice*" stated the water use system was completed and the water placed to beneficial use on May 27, 2018.

(2) It is certified that the permit holders have complied with the provisions of South Dakota State Law relating to completion of the water supply system and are entitled to divert 0.031 cubic feet of water per second for beneficial use. The location of the diversion point is:

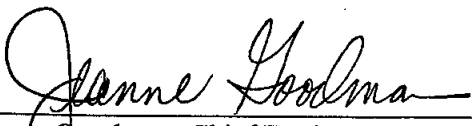
- 1,393'S and 631'E of the NW corner of Section 27, T1S, R5E (SW ¼ NW ¼)  
Latitude 43.936898, Longitude -103.516197

(3) The permit holders have complied with the provisions of South Dakota State Law relating to the application of water to beneficial use. The well serves the owners' home and four rental cabins.

(4) Pursuant to South Dakota Water Law 46-5-30.1 Chace and Leslie Larsen, 23935 Pink Cabin Rd., Hill City SD 57745 the holders and/or owners of Water Right No. 2775-2 are issued a license to appropriate water, the right to use 0.031 cubic feet of water per second from ground water, one well (Crystalline Rock) with a priority date of September 5, 2017 from the location specified in (2) of this license for commercial and domestic purposes.

This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Right No. 2775-2 and subject to the following qualifications:

- The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
- The permit holders shall report to the Chief Engineer annually the amount of water withdrawn from the Crystalline Rock aquifer.
- Water Permit No. 2775-2 authorizes a total annual diversion of 2.0 acre feet of water.



Jeanne Goodman, Chief Engineer  
Water Rights Program  
Department of Environment and Natural Resources

SEP 26 2018  
date

