

WATER PERMIT NO. 8150-3

Name of Applicant: **Charles Friedrich**

Address: **47811 US Hwy 14, Aurora SD57002**

Phone: **605 592-0589**

Amount of Water Claimed: **2.22 cfs**

Total Acres: **160**

Source of Water Supply: **groundwater (one well)**

Water to be used for: **irrigation**

County: **Brookings**

Type of Waste Disposal System:

Location: **1 mile east of Aurora**

PRIORITY

Date Received: **4-29-15**

Application/License Fee: **\$1050**

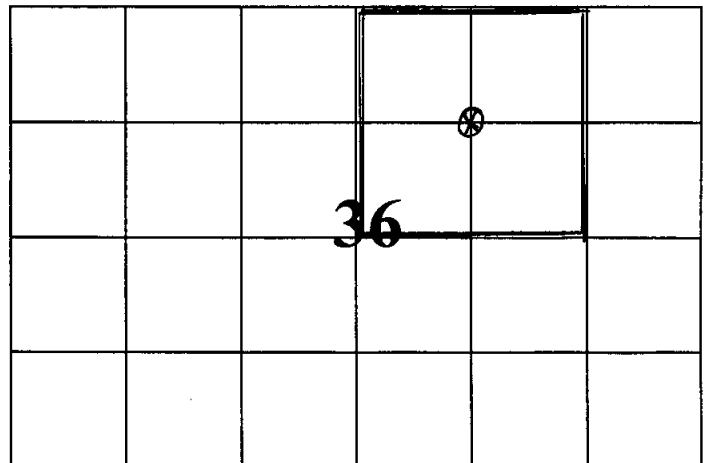
Corrected Application Received:

Period of Annual Use: **June 1 – September 30**

Remarks:

Diversion Point: **center of NE 1/4 Sec 36-T110N-R49W**

Land to be Irrigated: **NE 1/4 Sec 36-T110N-R49W**



Depth of Well: **50 feet**

Well Driller:

Remarks:

Type of Map: **aerial**

Prepared by:

Reviewed and the Number Assigned on: **4-30-15**

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____

FORM 2: Application for irrigation in South Dakota
(type or print)

Mail to: PMB 2020 DENR - Water Rights 523 E Capitol Ave Pierre, SD 57501-3182 ph. (605) 773-3352	No. <u>8150-3</u> (office use only) Hydrologic Unit <u>10170202</u>
	Basin <u>Sioux River</u>
	Newspaper <u>Brookings Register</u>
	<u>P.O. Box 177</u> <u>57006</u> <u>605-692-6271</u>

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APR 29 2015
WATER RIGHTS
PROGRAM

Application For Permit To Appropriate Water For Irrigation

Type of Application: ☒ New ☐ Vested Right ☐ Amendment/Correction to Permit No. _____
(Use predates Mar 2, 1955)

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

1. Name to Appear on Irrigation Permit CHARLES FRIEDRICH
(check one) ☒ Owner ☐ Tenant/lessee ☐ Owner's Legal Agent _____
(name and complete address if different than above name)
- Mailing Address 47811 US Hwy 14 Aurora S.Dak. 57002
(Address) (City) (State) (Zip Code)
- Home Phone 605-693-4349 Cell 592-0589 Email _____
2. Amount of water claimed 2.22 CFS or 1000 **GPM ***AF Total Acreage 160
(*Cubic Feet per Second) (**Gallons per Minute) (**Acre Feet - storage capacity of dam/dugout or annual use if applicable)
3. Source of water supply Well
4. Location of point of diversion 1 well Sec 36 NE 1/4 Sec 110N 49W
(example - 3 wells in SW 1/4 NE 1/4 section 12-T104N-R53W)
(approximate center) County Brookings
5. County or counties where water will be used Brookings
6. Annual period during which water is to be used June 1 - Sept 30
7. List below each forty acre division, or lot, or fraction thereof and show number of acres to be irrigated in each.
(Attach sheet if more space is needed)

Land Description	Acres	Land Description	Acres
<u>NE 1/4 Sec 36</u>	<u>40</u>		
<u>NE 1/4 Sec 36</u>	<u>40</u>		
<u>NE 1/4 Sec 36</u>	<u>40</u>		
<u>NE 1/4 Sec 36</u>	<u>40</u>		

8. Give a description of the project. (Attach sheet if more space is needed)

We are going to irrigate 100-102 acres. It is lighter in some areas and we have high line wires running angled across the quarter rather than parallel. It makes it more expensive due to the fact we have to go around them and we can't get as many acres.

I, Charles Friedrich, the applicant, certify that I have read this application, have examined the attached map, and that the matters stated are true.

**SOUTH DAKOTA
WATER PERMIT NO. 8150-3**

Date of first receipt of application April 29, 2015.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 8150-3 to Charles Friedrich, 47811 US Hwy 14, Aurora SD 57002 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. 8150-3 appropriates 2.22 cubic feet of water per second from one well to be completed into the Big Sioux:Aurora Aquifer (50 feet deep) located in the center of the NE 1/4 Section 36 for irrigation of 160 acres located in the NE 1/4 Section 36; all in T110N-R49W.
2. The amount of the appropriation may not exceed 2 acre feet annually for each acre of land to which water is actually and beneficially applied for irrigation. The water is to be used during the following described annual period: June 1 – September 30.
3. The date from which applicant may claim right is April 29, 2015.
4. The date of approval of Permit No. 8150-3 is July 20, 2015.
5. One-fifth of the construction is to be completed on or before January 20, 2018.
6. All construction is to be completed on or before July 20, 2020.
7. Water is to be put to beneficial use on or before July 20, 2024.
8. 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 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.
2. The well authorized by Permit No. 8150-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

WATER MANAGEMENT BOARD

By: Jeanne Goodman

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

AUG 11 2015

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 1 Have test holes been drilled ☐ Yes ☒ No Drilled by Lacey Well Drilling
(if yes, please provide copies of logs) this week hopefully

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

c) Well Depth 50 Depth to Top of Water Bearing Material Depth to Water from Surface

d) Distance to nearest existing domestic well:

On applicant's property 1/2 mile On property owned by others 1/2 mile

2. Wastewater Disposal System Information

a) Type of System (i.e. septic tank, drain field)

b) System Capacity (gallons) Year Constructed

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)

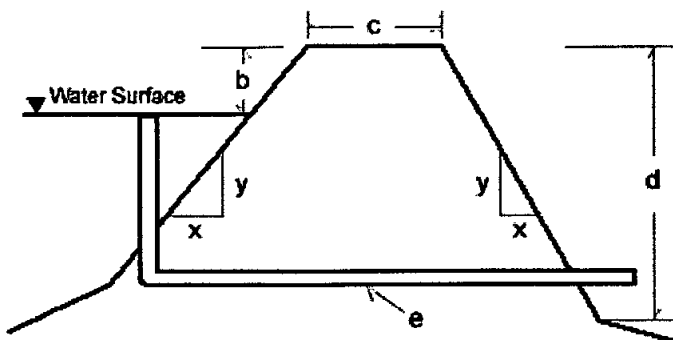
Upstream

Downstream

h) Surface Area of Impoundment

i) Storage Acre Feet

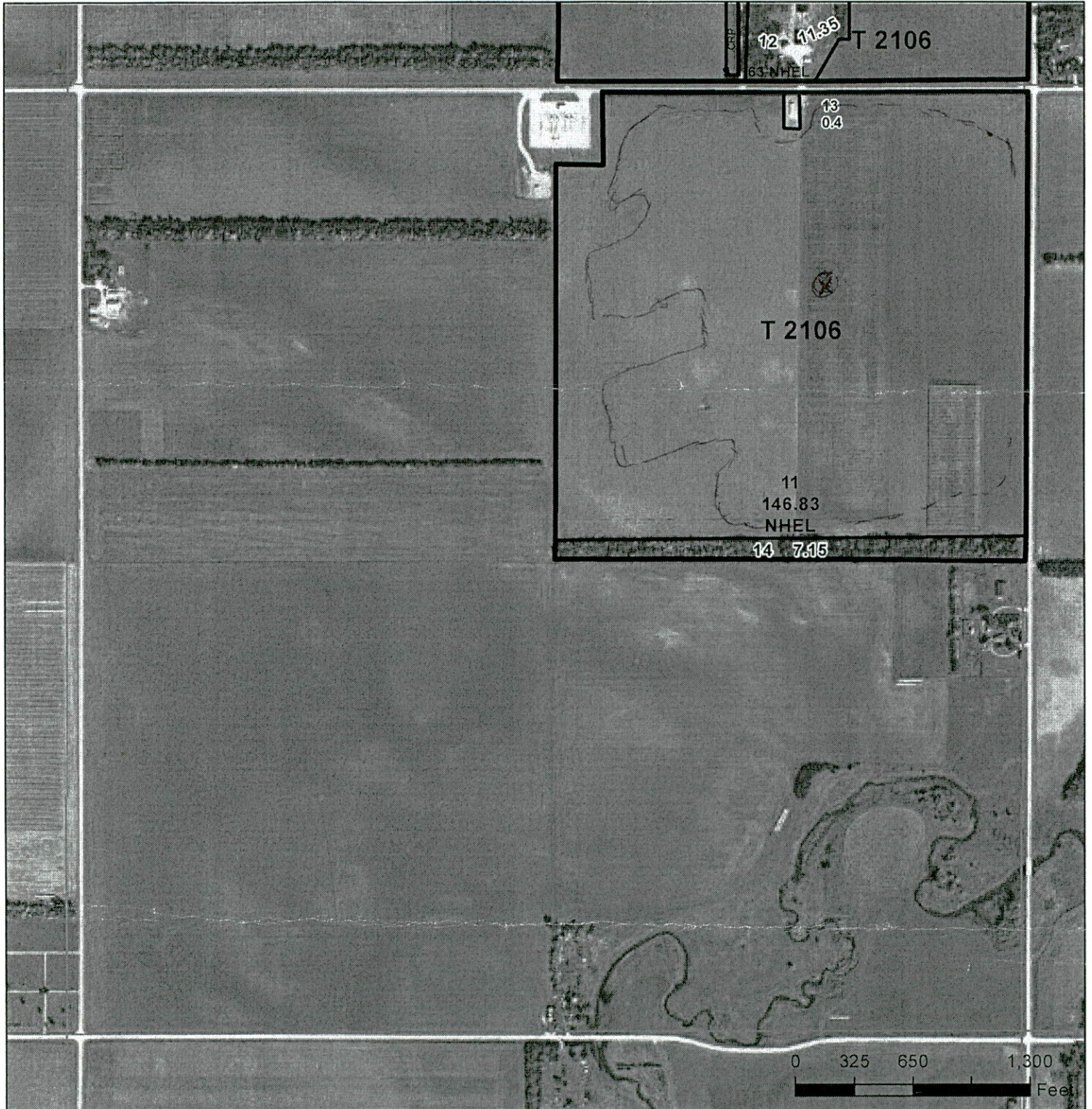
j) Drainage Area Above Dam Acres





United States
Department of
Agriculture

Brookings County, South Dakota



Common Land Unit  Tract Boundary
Common Land Unit  PLSS
 Cropland

Wetland Determination Identifiers

-  Restricted Use
-  Limited Restrictions
-  Exempt from Conservation
-  Compliance Provisions



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2015 Program Year

Map Created February 17, 2015

Farm 159

36 -110N -49W

United States Department of Agriculture (USDA) Farm Service Agency (FSA) maps are for FSA Program administration only. This map does not represent a legal survey or reflect actual ownership; rather it depicts the information provided directly from the producer and/or National Agricultural Imagery Program (NAIP) imagery. The producer accepts the data 'as is' and assumes all risks associated with its use. USDA-FSA assumes no responsibility for actual or consequential damage incurred as a result of any user's reliance on this data outside FSA Programs. Wetland identifiers do not represent the size, shape, or specific determination of the area. Refer to your original determination (CPA-026 and attached maps) for exact boundaries and determinations or contact USDA Natural Resources Conservation Service (NRCS).

Signed By Jerry M. Wolf Date 12-20-88

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date 4/29, 2015

RECEIVED OF Friedrich Farm 47807 US Hwy 14 Aurora SD 57002

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

Fee for Application for Permit No. <u>8150-3</u> to Appropriate Water, to construct and to put water to beneficial use	850	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. <u>8150-3</u>	200	00
Fee for Filing Transfer Form _____		
Fee for _____		
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	1050 00

No. 07378

By 
Chief Engineer

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Dear Eric,

Thank you for your assistance in doing the application, if anything isn't right please contact me at 605-693-4541 or my cell 605-592-0589. Thank you.

Oh I was going to mention we currently farm an irrigated quarter in the same section as that system puts 1000 g.p.m. its a good well & that one is in the SW quarter of Sec 36. The well is actually capable of 1800 g.p.m. we are nozzled down for low pressure. Thanks again

Sincerely,
Chuck Fridrich

Water Rights Program - File Documentation

NAME: Chuck Friedrich

ADDRESS: 47811 US Hwy 14, Aurora SD

DATE: 4-29-15 **COUNTY:** BG **TELEPHONE:** 605 592-0589

RE: pending application

COMMENTS:

I called Chuck Friedrich to clarify the number of acres requested on his application. I explained he could apply for the entire 160 acres as he outlined in Item No. 7, knowing that after the project was inspected, it would be licensed for the number of acres that actually was developed. He said he would like to do that. Because of the high lines wires running thru the property they were not quite certain how they were going to configure the system or systems.

He further stated he did not think they would need the 1000 gpm either but would like to apply for that amount since it was within the statutory limit.

The proposed well depth would be approximately 50 feet based on the well depth of the adjacent well located in the SW 1/4 Section 36-T110N-R49W.


Karen Schlaak
Water Rights Program



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

denr.sd.gov

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 8150-3, Charles Friedrich**

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. 8150-3, Charles Friedrich, 47811 US Hwy 14, Aurora SD 57002.

The Chief Engineer is recommending APPROVAL of Application No. 8150-3 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 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.
2. The well authorized by Permit No. 8150-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

See report on application for additional information.

Jeanne Goodman, Chief Engineer
June 26, 2015

Report to the Chief Engineer

Application No. 8150-3

Charles Friedrich

June 4, 2015

Water Permit Application Number 8150-3 proposes to appropriate water from the Aurora management unit of the Big Sioux aquifer at a maximum rate of 2.22 cubic feet per second (cfs). Water is to be diverted from a proposed well located in the center of the NE ¼ Section 36 in T110N-R49W with a proposed depth of 50 feet. The water is to be used for the irrigation of 160 acres located in the NE ¼ Section 36 in T110N-R49W.

Aquifer: Aurora Management Unit of the Big Sioux aquifer (BS:A)

Aquifer Characteristics and Hydrogeology

The Big Sioux aquifer is a shallow, glacial aquifer that underlays the Big Sioux River Valley and many of its tributaries (Koch, 1980). It is made up of very permeable, well-sorted glacial outwash sand (mostly medium to very coarse) and gravel (mostly very fine to medium) that overlies a relatively impermeable glacial till (Hamilton, 1989 and Koch, 1980). Near the Big Sioux River and major tributaries the aquifer is under unconfined conditions; elsewhere it can underlie glacial till and be under confined conditions (Hamilton, 1989).

The Big Sioux: Aurora aquifer underlies part of Brookings and Moody counties in South Dakota and parts of Lincoln and Pipestone counties in Minnesota. Near the approximate center of T109N and R47W the potentiometric map of the Big Sioux aquifer in Brookings County by Hamilton (1989) shows the direction of groundwater flow diverges with groundwater flow to the north of this area moving toward the northwest and groundwater flow south of this area moving toward the southwest. This essentially subdivides the Aurora management unit into a northern portion and a southern portion as discussed by Buhler (2012). The northern portion of the Big Sioux: Aurora aquifer underlies about 63,000 acres of Brookings county (Buhler, 2012).

The proposed location and depth of the well for this application indicates that this application is proposing to appropriate water from the northern portion of the Aurora management unit of the Big Sioux aquifer. There was no testhole information submitted with this application, however the well completion report for the nearby Water Right No. 4416-3, completed into the Big Sioux: Aurora in the SW ¼ Section 36 in T110N-R49W was included with this application. The completion report for the well that supplies Water Right No. 4416-3 indicated the well is 49 feet deep and contains aquifer materials (sand and gravel) from 3 to 48 feet below grade. Additionally, Water Rights observation well BG-77I, monitoring the Big Sioux: Aurora, is located approximately 0.4 miles to the northeast of the proposed location for the well for this application. The well log for BG-77I indicates aquifer materials from one to nine feet below grade and 15 to 45 feet below grade (Water Rights, 2015a and SDGS, 2015).

Although glacial deposits can be highly variably, similar geology to these two wells is expected at the proposed well site. At the proposed location for this well the aquifer is expected to be under water table conditions.

Water Availability

Water Permit Application No. 8150-3 proposes to appropriate water from the Big Sioux: Aurora aquifer. The probability of unappropriated water available from an 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 lower than the Greenhorn Formation and a water distribution system has applied for a permit, the Board need not consider the recharge/withdrawal issue. Here, a water distribution system is not involved and the Big Sioux: Aurora aquifer is not older or lower than the Greenhorn Formation, therefore the withdrawal/recharge issue must be considered.

Hydrologic Budget

Recharge

Big Sioux: Aurora aquifer is recharged by infiltration from precipitation and seepage from surface water (Hamilton, 1989). A 1985 study by Hedges et al. reported recharge to the Big Sioux: Aurora aquifer utilizing three different methods. Based on observation well analysis, recharge was estimated at 5.0 inches per year, which yields an estimated recharge rate of 26,250 acre-feet per year for the northern portion of the management unit (Hedges et al., 1985). Based on the compiled best fit modeling data from various investigations recharge was reported at 3.6 inches per year (information included from other management units in estimate), which yields an estimated recharge rate of 18,900 acre-feet per year for the northern portion of the management unit (Hedges et al., 1985). The third method used regional flow net analysis to estimate recharge at 1.0 inch per year for the entirety of the Big Sioux aquifer; this yields an estimated annual recharge for the northern portion of the Aurora management unit of 5,250 acre feet (Hedges et al., 1985). Of the regional flow net analysis Hedges et al. (1985) comments, “It should be noted that recharge rates calculated using flownet analysis are suspect and conclusions based on this method are questionable.” Of these three methods the observation well analysis is considered to be the most reflective of actual conditions since it utilized management unit specific data and is more closely based on real world observation. The observation well estimate for recharge will also be utilized in this report as the estimate for average annual recharge, since it is more reflective of actual conditions when evaluating the hydraulic budget for the aquifer.

Withdrawals

Withdrawals from the aquifer are from pumping, evapotranspiration, and leakage to surface water (Hamilton, 1989 and Hansen, 1986). Water uses in the aquifer can be divided into irrigation and non-irrigation uses.

Non-irrigation uses of the northern portion of the Big Sioux: Aurora includes domestic, commercial (2), industrial (4), municipal (3), municipal future use (1), and rural water (2). The amount of water withdrawn by domestic uses are not considered a significant portion of the hydraulic budget of the aquifer; additionally with the development of rural water systems in the area many domestic wells may no longer be in use. For non-irrigation use, average annual use can be estimated by assuming that pumping will occur at the maximum diversion rate 60% of the time for water rights/permits limited by diversion rate only. For water rights/permits limited to an annual volume, full use of that volume is assumed for estimation of average annual withdrawal. The City of Aurora purchases water from Brookings Municipal Utilities and maintains Water Right No. 1952-3 for “fire protection and farm use” (Friedeman, 2015). The City of Brookings has a future use permit for 2,426 acre-feet, and water use from 2003 to 2014 by the City of Brookings from the Big Sioux: Aurora aquifer averaged 2,074 acre-feet (Water Rights, 2003-2015). Non-irrigation water rights/permits limited to an annual volume total 1,994 acre-feet per year. Average annual use from water rights/permits limited by diversion rate only can be estimated at 1,293 acre-feet per year. This results in a total estimated non-irrigation use of 7,787 acre-feet per year.

The Water Rights Program collects and maintains irrigation data from across the state. The northern portion of the Big Sioux: Aurora aquifer currently contains 43 irrigation water rights/permits authorizing the irrigation of 6,051 acres (5,715 licensed acres and 336 permitted acres). Using the 1994 to 2014 Irrigation Questionnaire Data, the average application rate per licensed/permitted acres is 5.84 inches per acre for the irrigation water rights/permit appropriating water from the northern subunit of the Big Sioux: Aurora aquifer (Water Rights, 1994-2015). This results in an estimated average annual withdrawal for irrigation use from the northern subunit of the Big Sioux: Aurora aquifer of about 2,945 acre-feet per year. Inclusion of the proposed acres of this application raises this to about 3,044 acre-feet per year.

The estimated total average annual appropriation from the northern portion of the aquifer including the appropriation proposed by this application is 10,831 acre-feet. When compared to the estimated average annual recharge based on observation well data of 26,250 acre-feet, estimated average annual recharge exceeds average annual withdrawals. Therefore there is a reasonable probability that water is available to meet the needs of this application.

Observation Wells

In determining the availability of unappropriated water for a permit application Administrative Rule 74:02:05:07 requires the Water Management Board to rely on 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 annual recharge. Observation wells offer a picture of conditions in the aquifer over the period of record.

The SD-DENR Water Rights monitors 15 observation wells completed into the Big Sioux: Aurora of which 14 are located in the northern portion of the management unit. The observation well closest to the proposed well location for this application is BG-77I located 0.4 miles northeast of the proposed well location. The hydrograph of observation well BG-77I is shown in Figure 1. Observation well BG-77I shows water levels primarily responding to climatic conditions rather than the temporal effects of pumping. Observation wells in the Big Sioux: Aurora generally show steady or increased water levels over their periods of record. These wells typically show seasonal drawdown, however the temporal effects of pumping are masked by climatic conditions. This indicates that natural conditions dominate the aquifer. Therefore there is a reasonable probability that unappropriated water is available.

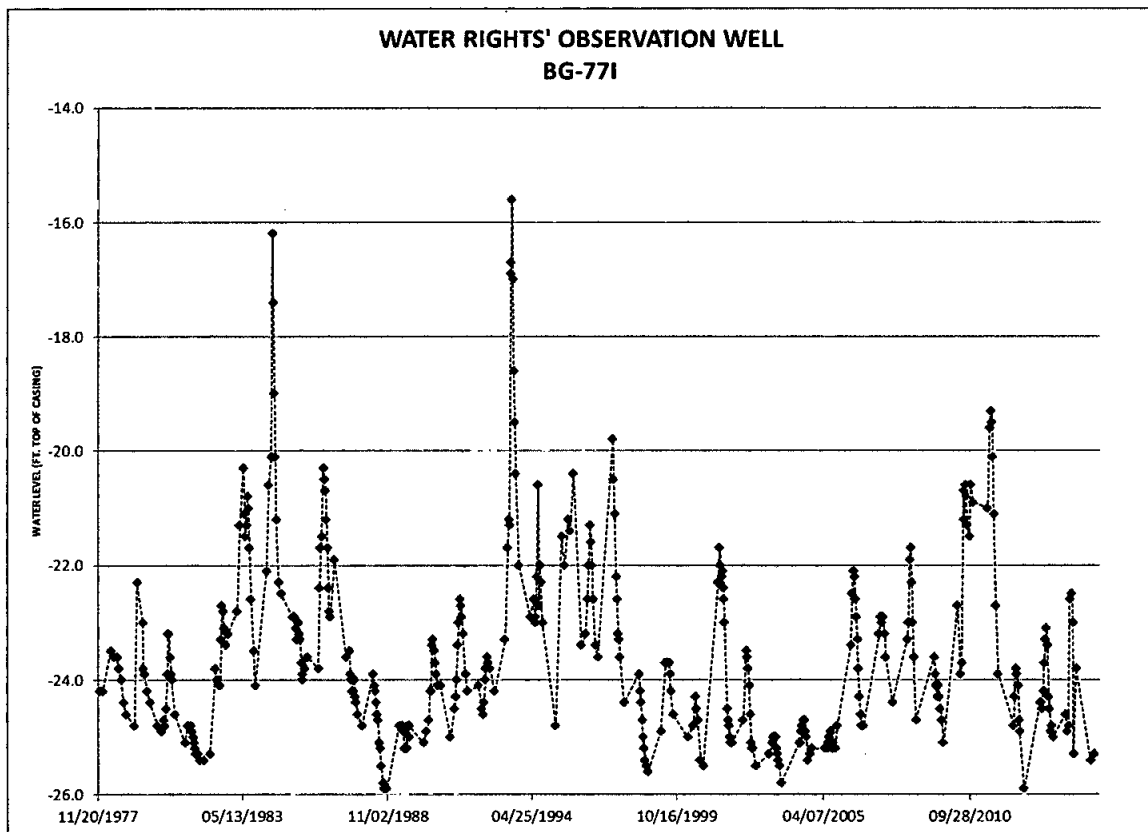


Figure 1: Observation Well Hydrograph BG-77I (Water Rights, 2015a)

Existing Water Rights/Permits

The approximate diversion points for water rights/permits in the area of the proposed location for this well are shown in Figure 2. The nearest water right/permit to the proposed location of the well for this application is Water Right No. 4416-3 located approximately 0.75 miles to the southwest. The applicant indicated they currently farm the area irrigated by Water Right No. 4416-3. There are domestic wells on file with the SDDENR-Water Rights Program

within one mile of the proposed well location for this application. Most appear to be competed into this aquifer. In the past, the Water Management Board has recognized that to place water to maximum beneficial use, a certain amount of drawdown may occur. Since the aquifer is under unconfined conditions drawdown due to pumping would not typically be significant far from the well site. Additionally Hamilton (1989) notes that, “Effects of withdrawals from wells that tap the Big Sioux aquifer generally are small because of extensive recharge and unconfined conditions. Drawdown of water levels is temporary and a few feet at most at distances of about a mile from large-capacity wells.” Therefore, nearby adequate wells are not expected to be adversely impacted by the proposed diversion.

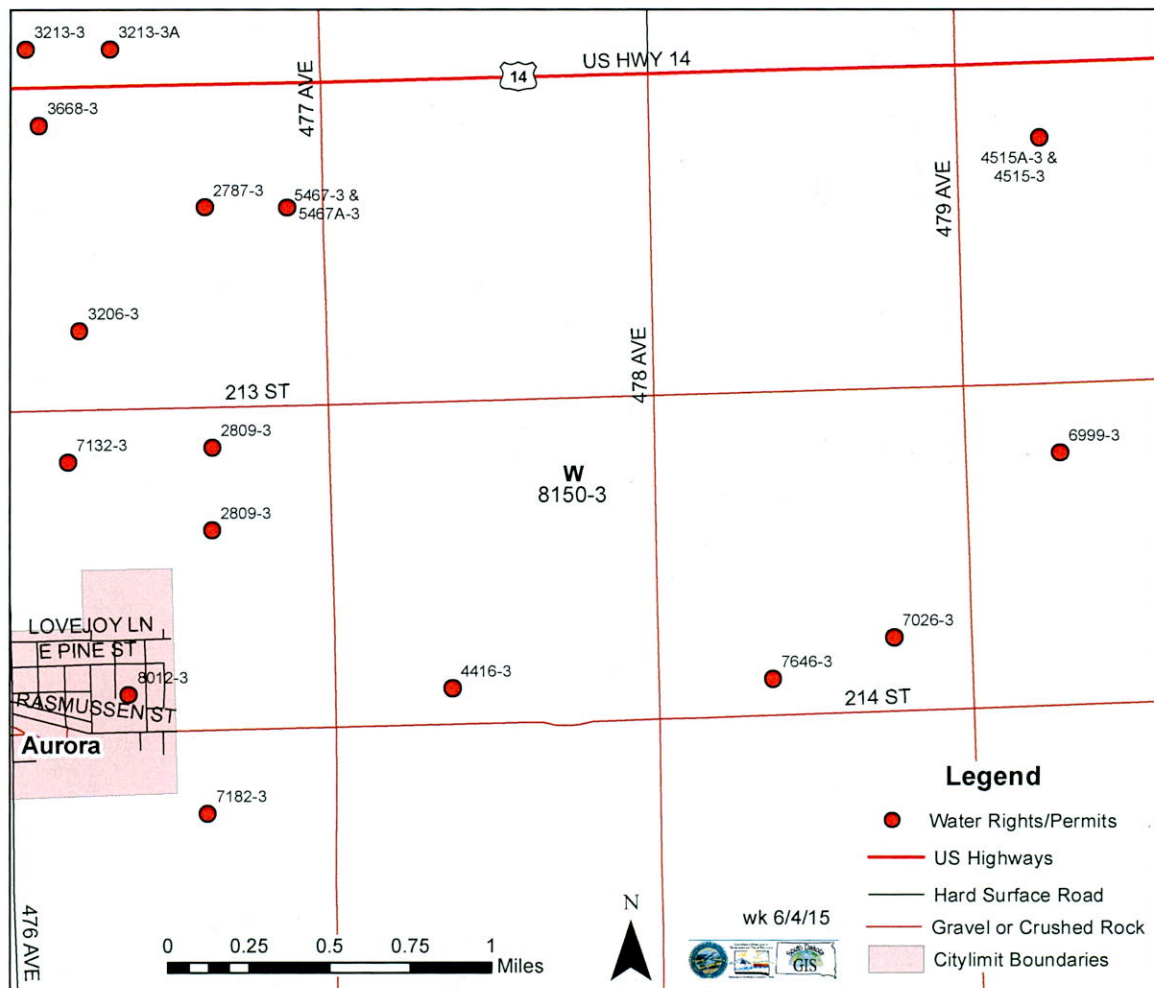


Figure 2: Approximate locations of diversion points for water rights/permits completed into the Big Sioux: Aurora aquifer in the area of the proposed well (Water Rights, 2015b)

The Big Sioux: Aurora aquifer is a relatively thin aquifer with a limited amount of water in storage. While the average annual withdrawal would not exceed average annual recharge to the aquifer, conditions may occur when the withdrawal exceeds recharge. When this occurs,

water will be removed from storage, consequently reducing the saturated thickness of the aquifer. If the saturated thickness is reduced to the extent the water rights/permits can no longer pump at their developed or "historically established" rates, this may be considered an adverse impact.

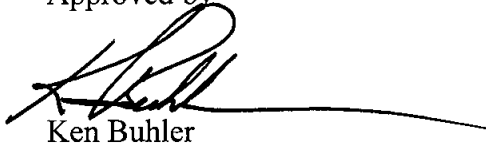
Conclusions

1. Water Permit Application No. 8150-3 proposes to appropriate water from the Aurora management unit of the Big Sioux aquifer at a maximum rate of 2.22 cfs for the irrigation of 160 acres located in the NE ¼ Section 36 in T110N-R49W. Water is to be diverted from a proposed well (50 feet deep) located in the center of the NE ¼ Section 36 in T110N-R49W.
2. There is a reasonable probability that water is available to meet the needs of this application.
3. There is a reasonable probability that this appropriation will not adversely impact existing nearby adequate wells.


Whitney Kils

SDDENR-Water Rights Program

Approved by


Ken Buhler

SDDENR-Water Rights Program

References

- Beissel, D. and Barari, A. 1976. Ground-Water Study for the Brooking-Deuel Rural Water System. USGS, Vermillion, SD.
- Buhler, K. 2012. Report to the Chief Engineer on Water Permit No. 7392-3 and Future Use Permit Application No. 7393-3 Lincoln Pipestone Rural Water. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.
- Friedeman, B. 2015. Environmental Scientist. SDDENR-Drinking Water Program, Pierre, SD. Personal Communication. June 18, 2015.
- Hamilton, L. 1989. Water Resources of Brookings and Kingsbury Counties, South Dakota. Water-Resources Investigations Report 88-4185. USGS, Huron, SD.
- Hansen, D. S. 1986. Water Resources of Lake and Moody Counties, South Dakota. Water-Resources Investigations Report 84-4209. USGS, Huron, SD.
- Hansen, D. S. 1988. Appraisal of Water Resources of the Big Sioux Aquifer, Moody County, South Dakota. Water-Resources Investigations Report 87-4057. USGS, Huron, SD.
- Hedges, L.S., Burch, S. L., Iles, D. L., Barari, R. A., and Schoon, R. A. 1982. Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota, and Iowa. Task 1: Bedrock Topography and Distribution, Task 2: Extent of Aquifers, Task 3: Ground-Water Storage, Task 4: Computerized Data Base, Final Report. U.S. Army Corps of Engineers Contract DACW 45-80-C-0185.
- Hedges, L.S., Allen, J. and Holly, D.E. 1985. Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota, and Iowa. Task 7: Ground-Water Recharge. U.S. Army Corps of Engineers Contract DACW 45-80-C-0185.
- Koch, N. C. 1980. Appraisal of the Water Resources of the Big Sioux Aquifer, Brookings, Deuel and Hamlin Counties, South Dakota. USGS, Huron, SD.
- SD Geological Survey. 2015. Lithological Logs Database, SD DENR-Geological Survey Program, Vermillion, SD.
- Water Rights. 1980-2015. "1979-2014 Irrigation Summaries by Aquifer": SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.
- Water Rights. 2003-2014. "2003-2014 Non-irrigation Water Use Reports": SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.
- Water Rights. 1995. Water Right File 2313-2. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

Water Rights. 2015a Observation Well Files, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, SD.

Water Rights. 2015b. Water Right/Permit Files. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

Water Rights. 2015c. Well Completion Reports. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

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10/

Exhibit "A"

Affidavit of Publication

State of South Dakota

JUL 24 2015

SS WATER RIGHTS PROGRAM

County of Brookings

Katherine Foiles of said county, first duly sworn, on oath, says: That she is the office clerk of THE BROOKINGS REGISTER, a daily newspaper, printed and published in the City of Brookings, in said County of Brookings, and State of South Dakota; that she has full and personal knowledge of the facts herein stated; that said newspaper is a legal newspaper and has a bona fide circulation of at least two hundred copies of each issue daily; that said newspaper has been published within the said County of Brookings and State of South Dakota, for more than one year prior to the first publication of Exhibit "A," hereto attached and herein mentioned, and was and is printed that the

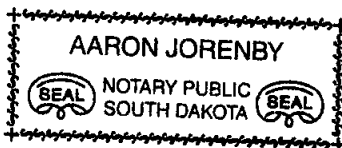
Leg#901 Application 8150-3

same was published, is hereto attached marked Exhibit said newspaper for _____ 1 times, to-wit:

July 8, 2015

said Exhibit "A" inures to the sole benefit for the publishers of said newspaper; that no agreement or understanding for the division thereof has been made with any other person, and that no part thereof has been agreed to be paid to any person whomsoever; that the fees charged for the publication thereof are:

Twenty- three dollars and seventy cents \$23.70



[Handwritten signature]

9 day of

July

2015

[Handwritten signature]

Notary Public in and for the County of Brookings, South Dakota.
My Commission expires February 22, 2020.

must be filed by July 20, 2015. 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, information concerning this application is available at <http://dssr.sd.gov/public>. Contact: Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pinner, Secretary, Department of Environment and Natural Resources. Published once at the total approximate cost of \$23.70.

PUBLIC NOTICE

Legal 901, 1x, 7/8
NOTICE OF APPLICATION NO 8150-3 to

Appropriate Water

Notice is given that

Charles Friedrich,

47811 US Hwy 14,

Aurora SD 57002 has

filed an application for a

water permit to appropriate

2.22 cubic feet of

water per second from

one well to be completed

into the Big

Sioux-Aurora Aquifer

(50 feet deep) located in

the center of the NE 1/4

Section 36 for irrigation

of 160 acres located in

the NE 1/4 Section 36:

all in T11N-R43W.

Pursuant to SDCL 46-

2A-2, the Chief

Engineer recommends

APPROVAL of

Application No. 8150-3

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. In

accordance with SDCL

46-2A-23, the Chief

Engineer will act on this

application, as recommended,

unless 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.

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 (605-773-3332)

and the applicant's mailing

address is given above. A petition filed

by either an interested person

or the applicant



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

denr.sd.gov

June 29, 2015

Brookings Register
PO Box 177
Brookings SD 57006

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 8150-3 to Appropriate Water. Please publish the notice once on July 8, 2015. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352.

The applicant must verify to you that the notice is to be published and arrange for payment. **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is Charles Friedrich, 47811 US Hwy 14, Aurora SD 57002 (Ph # 605-693-4341).

Please send the Water Rights Program an affidavit or the enclosed Proof of Publication form immediately.

The applicant pays the cost of publication, but the Water Rights Program records require an affidavit or Proof of Publication. Delays in receiving the affidavit can be costly to the applicant.

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures



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(S) RIGHT AWAY.**

June 29, 2015

Charles Friedrich
47811 US Hwy 14
Aurora SD 57002

Dear Mr. Friedrich:

Water Permit Application No. 8150-3 for irrigation use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Brookings Register printed at Brookings SD (Ph # 605-692-6271). You will need to contact the newspaper(s) 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(s) to authorize publication of your Notice and to arrange for payment. Early contact with the paper(s) 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 July 8, 2015. The applicant is responsible for payment. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352 or email: Karen.schlaak@state.sd.us.

NOTICE OF APPLICATION NO. 8150-3 to Appropriate Water

Notice is given that Charles Friedrich, 47811 US Hwy 14, Aurora SD 57002 has filed an application for a water permit to appropriate 2.22 cubic feet of water per second from one well to be completed into the Big Sioux:Aurora Aquifer (50 feet deep) located in the center of the NE 1/4 Section 36 for irrigation of 160 acres located in the NE 1/4 Section 36; all in T110N-R49W.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 8150-3 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. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. 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.

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 July 20, 2015.

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. Information concerning this application is available at <http://denr.sd.gov/public>. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

Published once at the total approximate cost of _____.



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

denr.sd.gov

AUG 11 2015

Charles Friedrich
47811 US Hwy 14
Aurora SD 57002

Dear Mr. Friedrich:

Enclosed is Water Permit No. 8150-3 authorizing construction of the water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

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 informational 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

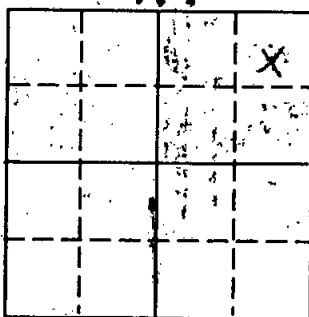
enclosures

SOUTH DAKOTA WATER WELL COMPLETION REPORT

8150-3
11-02

Location NE 1/4 NE 1/4 Sec 36 Twp 112N Rg 49W

County Brookings



Please mark well location with an "X"

Well completion Date

11-2-15

1 Mile

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.)

42 m ft from Farmstead (Identify source)

PROPOSED USE:

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

METHOD OF DRILLING:

False Casing - Bucket

CASING DATA:

- ☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
<u>20 LB/FT</u>	<u>14 IN</u>	<u>1 FT</u>	<u>40 FT</u>	<u>20 IN</u>
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
<u>Cement</u>		<u>12 Lb/gal</u>	<u>0 FT</u>	<u>12 FT</u>
<u>Grout</u>		<u>12 Lb/gal</u>	<u>12 FT</u>	<u>22 FT</u>

Describe grouting procedure

SCREEN

- ☐ Perforated pipe ☒ Manufactured

Diameter 14 Inches Length 10 Feet

Material PVC 1100R

Slot Size 100 Set From 40 Feet to 50 Feet

Other information

WAS A PACKER OR SEAL USED?

- ☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

- ☒ Yes, How?

Chlorine

- ☐ No, Why Not?

in pack

Lab sample sent to for water quality analysis

Log

Please return **WHITE COPY** to: DENR Water Rights

Well Owner:

Chuck Friedrich

Business Name:

Address:

47807 US Hwy 14

City, State, Zip:

Aurora SD 57022

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
<u>Sandy Topsoil</u>	<u>0</u>	<u>2</u>
<u>Sandy yellow clay</u>	<u>2</u>	<u>9</u>
<u>Rusty Gravel</u>	<u>9</u>	<u>23</u>
<u>Clay lens</u>	<u>23</u>	<u>24</u>
<u>medium Gravel</u>	<u>24</u>	<u>50</u>

STATIC WATER LEVEL

21' FEET

If flowing: closed in pressure

PSI

GPM flow

through

Inch pipe

Controlled by

- ☐ Valve

- ☐ Reducers

- ☐ Other

Reduced flow rate

GPM

Can well be completely shut in?

WELL TEST DATA:

- ☒ Pumped

Describe:

Sub

- ☐ Bailed

- ☐ Other

Pumping Level Below Land Surface

4.3 Ft. After

2 Hrs. pumped

500 GPM

Ft. After

Hrs. pumped

GPM

If pump installed, pump rate:

GPM

REMARKS

This well was drilled under license # 111

And this report is true and accurate.

Drilling firm:

Lacey Well Drilling Inc

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Chuck Friedrich

Date:

12-10-15

523 E Capitol Ave.

Pierre SD 57501

RECEIVED
FOR DEPOSIT
SD STATE TREASURER
DENR WATER RIGHTS
1701269763
DEC 15 2015
FIRST PRIORITY MAIL
WATER RIGHTS
PROGRAM

RECEIVED

SEP 12 2016

WATER RIGHTS
PROGRAMNOTICE OF COMPLETION OF WORKS AND
APPLICATION OF WATER TO BENEFICIAL USEDate Sept 8-16TO: Water Rights Program, DENR
523 E. Capitol
Pierre, SD 57501-3181FROM: CHARLES FRIEDRICH

(name)

47811 US Hwy 14

(address)

AURORA, S.D. 57002

(city, state, zip)

605-693-4541

(phone) or (home)

cell
605-592-0589

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. 8150-3 states that the water use system is to be constructed by July 20-2020, and water is to be put to beneficial use by July 20-2024.

(date)

(date)

The water use system was completed on 6-21-16.

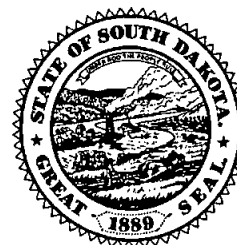
(date)

Applying the water to beneficial use was completed on 6-23-16.

(date)

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

Charles Friedrich
(signature)





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

September 14, 2016

8150-3

Charles Friedrich
47811 US Hwy 14
Aurora SD 57002

Dear Mr. Friedrich:

I am writing to acknowledge receipt of the "Notice of Completion of Works" form that you sent in to let us know that you are completed with your irrigation system.

The system is now ready for inspection. Inspections are done on a county-by-county basis as staff time permits. You have done everything you need to do and the intervening time between the completion of your project and the staff inspection has no bearing on your water permit.

Someone from our office will contact you prior to the inspection to set up a time that is convenient for you. If you have any questions, please contact me.

Sincerely,

Genny McMath
Water Rights Program
(605) 773-3352
email: genny.mcmath@state.sd.us

Report of Examination of Works and/or Application of Water to Beneficial Use For Permit No. 8150-3

I have this day, 4/27/21, made a thorough examination of the water use system constructed by Charles Friedrich, 47811 US Hwy 14, Aurora SD 57002 of Permit No. 8150-3, bearing the priority of April 29, 2015 authorizing the diversion of 2.22 cu. ft. per second of the waters of groundwater Big Sioux: Aurora Aquifer for irrigation purposes, in Brookings County.

A. Works used to divert the water:

Well Information:

- 1) Well Drilling Firm: Lacey Well Drilling
- 2) No. of Wells 1
- 3) Depth(s) 50 feet
- 4) Well log is available Y If no, explain in comments

Comments: none

Casing:

- 1) Diameter 20 inches
- 2) Length 40 feet
- 3) Type plastic

Screen:

- 1) Type PVC
- 2) Length 10 feet
- 3) Static water level 21 feet

Pump:

- 1) Make NA
- 2) Model submersible
- 3) Size NA
- 4) Capacity 650 GPM

Motor:

- 1) Make NA
- 2) Model No. NA
- 3) Horsepower rating NA hp

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

- 1) Type PVC 2) Size 10 inches 3) Length 765 feet

C. Works used to apply water to beneficial use:

Center pivot:

- 1) Make Valley
2) Overall length 1133 feet
3) Number of towers 6
4) End gun Y
5) Capacity 650 GPM

Chemigation Equipment:

- 1) Does chemigate N

D. Compliance with Permit Requirements:

- 1) Permit qualifications being abided by Y

2) Irrigation Questionnaires checked to determine if permit owner started irrigation by the end of construction period Y

3) Exceptions to compliance are: none

E. Condition and Location:

1. The system is in good condition with the point(s) of diversion located as follows: From the NE corner of Sec 36 T110N-R49W 1830 ft S & 1320 ft W (S ½ NE ¼ of Sec 36) Lat 44.29153 Long -96.65231.

2. The works are capable of diverting and conveying to the place of use 1.45 cu. ft. per second of water which is to be used for irrigation. Water has been put to beneficial use to the maximum extent as follows:

All land in Sec 36-T110N-R49W

NW1/4 NE 1/4 - 25 ac
NE 1/4 NE 1/4 - 37 ac
SE 1/4 NE 1/4 - 33 ac
SW 1/4 NE 1/4 - 15 ac

comprising a total of 110 acres of land and the license should be issued for 1.45 cfs.

3. All structures, wells and lands on map Y

If no, describe: none

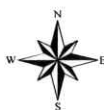
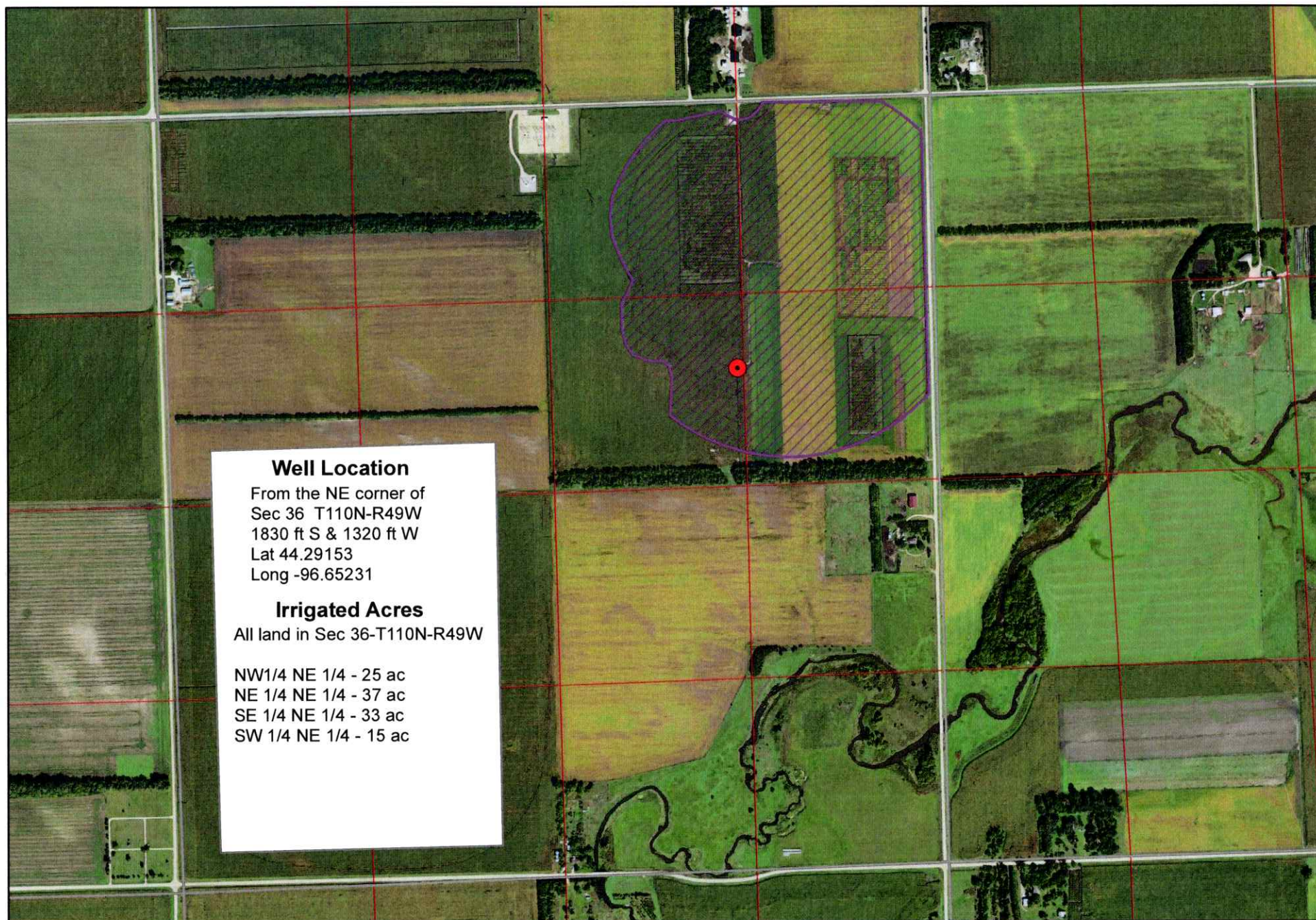
F. Comments or other permit(s) associated with the project:

Provide detailed explanation when multiple permits are involved or any discrepancy between what the permit was issued for and what was developed.



Darrell W DeBoer
Water Rights Inspector
DENR, Water Rights Program

Date report completed: 4/27/21



0 0.125 0.25 0.5 0.75 1 Miles



Darrell DeBoer
Water Right Inspector
DANR-Water Rights Program



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**
JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

8150-3

MAY 12 2021

Charles Friedrich
47811 US Hwy 14
Aurora SD 57002

Dear Mr. Friedrich:

Enclosed is Water License No. 8150-3. 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, State Water Laws provide that you have a continuing right to use the water. If you have any questions, please contact our office.

Sincerely,

Eric Gronlund, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

**STATE OF SOUTH DAKOTA
WATER LICENSE NO. 8150-3**

(1) Charles Friedrich, 47811 US Hwy 14, Aurora SD 57002 made Application No. 8150-3, April 29, 2015 for a water permit to divert 2.22 cubic feet of water per second from ground water, one well (Big Sioux Aurora Aquifer), Brookings County, South Dakota for irrigation purposes. Permit No. 8150-3, with a priority date of April 29, 2015 was approved July 20, 2015 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before July 20, 2020 and for the application to beneficial use of water on or before July 20, 2024.

The Permit holder submitted a "Notice of Completion of Works and Application of Water to Beneficial Use" on September 12, 2016. The "Notice" stated the water use system was completed and the water placed to beneficial use in June 2016.

(2) It is certified that the permit holder has complied with the provisions of South Dakota State Law relating to completion of the water supply system and is entitled to divert 1.45 cubic feet of water per second for beneficial use. The location of the diversion point is as follows:

- 1,830'S & 1,320'W of the NE corner of Section 36, T110N, R49W (S $\frac{1}{2}$ NE $\frac{1}{4}$)
Latitude 44.29153, Longitude -96.65231

(3) The permit holder has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use to irrigate the following land:

Section 36, T110N, R49W	NW $\frac{1}{4}$ NE $\frac{1}{4}$	25 acres
	NE $\frac{1}{4}$ NE $\frac{1}{4}$	37 acres
	SE $\frac{1}{4}$ NE $\frac{1}{4}$	33 acres
	SW $\frac{1}{4}$ NE $\frac{1}{4}$	15 acres
	Total	110 acres

(4) Pursuant to South Dakota Water Law 46-5-30.1 Charles Friedrich, 47811 US Hwy 14, Aurora SD 57002 the holder and/or owner of Water Right No. 8150-3 is issued a license to appropriate water, the right to use 1.45 cubic feet of water per second from ground water, one well (Big Sioux Aurora Aquifer) with a priority date of April 29, 2015 from the location specified in (2) of this license for irrigation purposes.

This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Right No. 8150-3 and subject to the following qualifications:

- The well approved under this water right 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 well authorized by Permit No. 8150-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with the Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28. *The well was drilled in November, 2015 by Lacey Well Drilling Inc. A copy of the well completion report is on file with the Water Rights Program.*

continued

- This Water Right is approved subject to the irrigation water use questionnaire being submitted each year.

Eric Gronlund

Eric Gronlund, Chief Engineer
Water Rights Program
Department of Agriculture and Natural Resources

MAY 12 2021

date

