

WATER PERMIT NO. 8847-3

Name of Applicant: **Troy Cook**

Address: **30983 452nd Avenue, Gayville SD 57031**

Phone: **605-659-0611**

Amount of Water Claimed: **1.11**

Total Acres: **65**

Source of Water Supply: **Groundwater**

Water to be used for: **Irrigation**

County: **Yankton**

Type of Waste Disposal System:

Location: **Approx. 1/2 northeast of Gayville SD**

PRIORITY Date Received: **03-20-24**

Application/License Fee: **\$950.00**

Corrected Application Received: **04-02-24**

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

Remarks:

Diversion Point: **SE 1/4 SE 1/4 Sec 1-T93N-R54W**

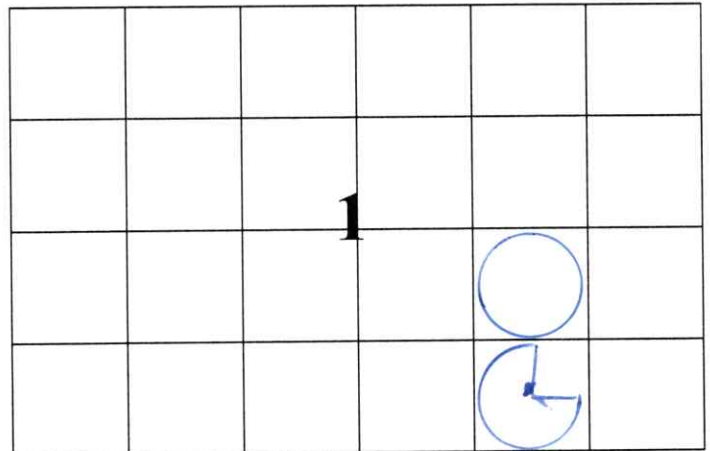
Land to be Irrigated: **NE 1/4 SE 1/4, SE 1/4 SE 1/4**
Sec 1-T93-R54W

Depth of Well: **100**

Well Driller:

Remarks:

Type of Map: **aerial**



Reviewed and the Number Assigned on: **04-02-24**

By: **Rachel Rodriguez**

Notice of Hearing - date to intervene: _____

**SOUTH DAKOTA
WATER PERMIT NO. 8847-3**

Date of first receipt of application March 20, 2024.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 8847-3 to Troy Cook, 30983 452nd Avenue, Gayville SD 57031, 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. 8847-3 appropriates 1.11 cubic feet of water per second (cfs) from one well to be completed into the Missouri: Elk Point Aquifer (approximately 100 feet deep) located in the SE 1/4 SE 1/4 Section 1 for irrigation of 65 acres located in the E 1/2 SE 1/4 Section 1; all in T93N-R54W. This site is located approximately one-half mile northeast of Gayville SD.
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: May 1 – September 30.
3. The date from which applicant may claim right is March 20, 2024.
4. The date of approval of Permit No. 8847-3 is June 25, 2024.
5. One-fifth of the construction is to be completed on or before December 25, 2026.
6. All construction is to be completed on or before June 25, 2029.
7. Water is to be put to beneficial use on or before June 25, 2033.
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 Water Permit No. 8847-3 is located near domestic wells and other wells which may obtain water from the same aquifer. Water withdrawals must be controlled 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. 8847-3 must be constructed by a licensed well driller and construction of the well and installation of the pump must 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. Pursuant to SDCL 46-5-6 which allows a greater diversion rate if the method of irrigation, time constraints, or type of soils so requires, Permit No. 8847-3 authorizes a maximum diversion rate of 1.11 cfs for the irrigation of 65 acres with an annual volume not to exceed 2 acre feet of water per acre per year.
4. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

WATER MANAGEMENT BOARD

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

JUL 25 2024
date



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

Mail to: SD DANR, Water Rights 523 E Capitol Ave Pierre, SD 57501-3182 ph. (605) 773-3352	No. <u>8847-3</u> Hydrologic Unit <u>10170102</u>
	Basin <u>Vermillion</u>
	Newspaper <u>Daily Press & Dakotan</u>
	(office use only)

PAID
MAR 20 2024
Ck# 200
Rec't# 32024

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 Troy Cook

Note: The "Name to Appear on Irrigation Permit" must be the name in which the property to be irrigated is held in.

Mailing Address 30983 452 N. d Ave Gayville S.d. 57031
(Address) (City) (State) (Zip Code)

Phone 605-659-0611 Mobile _____ Email _____

2. Amount of water claimed 1.11 *CFS or 500 **GPM _____ ***AF Total Acreage 65
(*Cubic Feet per Second) (**Gallons per Minute) (**Acre Feet - storage capacity of dam/dugout or annual use if applicable)

3. Source of water supply ground water one well

4. Location of point of diversion 1 well in the SE 1/4 of the SE 1/4 Section 1 - T93N-R54W
(example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)
T93 + 92N R54W County Yankton

5. County or counties where water will be used Yankton

6. Annual period during which water is to be used May 1 - September 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
SE 1/4 of the SE 1/4 T93 + 92N R54W	30		
NE 1/4 of the SE 1/4 T93 + 92N R54W	35		

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

Irrigate crop land

Requesting diversion rate greater than the statutory limit

RECEIVED

MAR 20 2024

OFFICE OF
WATER

I, Troy C. Cook Owner, 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.

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 _____
 (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) 100 Depth to Top of Water Bearing Material _____ Depth to Water from Surface _____

d) Distance to nearest domestic well on applicant's property Artesian well 400 ft Property owned by others I own Myself

2. Wastewater Disposal System Information

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

b) System Capacity (gallons) unknown Year Constructed unknown

c) Connected to the City of NO Sanitary System _____

3. Dugout Information

a) Surface Dimensions No Dugout 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 No Dams

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)

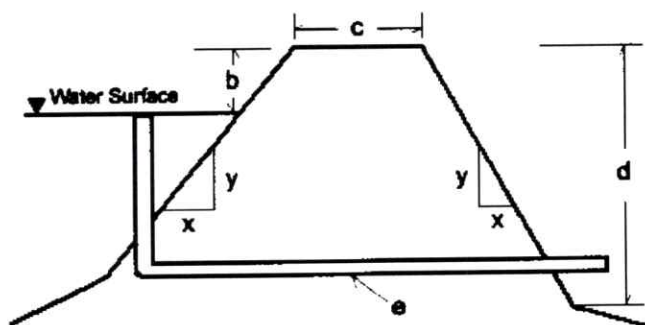
Upstream _____

Downstream _____

h) Area of Impoundment _____

i) Storage _____ Acre Feet

j) Drainage Area Above Dam _____ Acres



94N 54W
Section: 35

94N 54W
Section: 36

94N 53W
Section: 31

309 ST

93N 54W
Section: 02

93N 54W
Section: 01

93N 53W
Section: 06

10170102 Vermilion

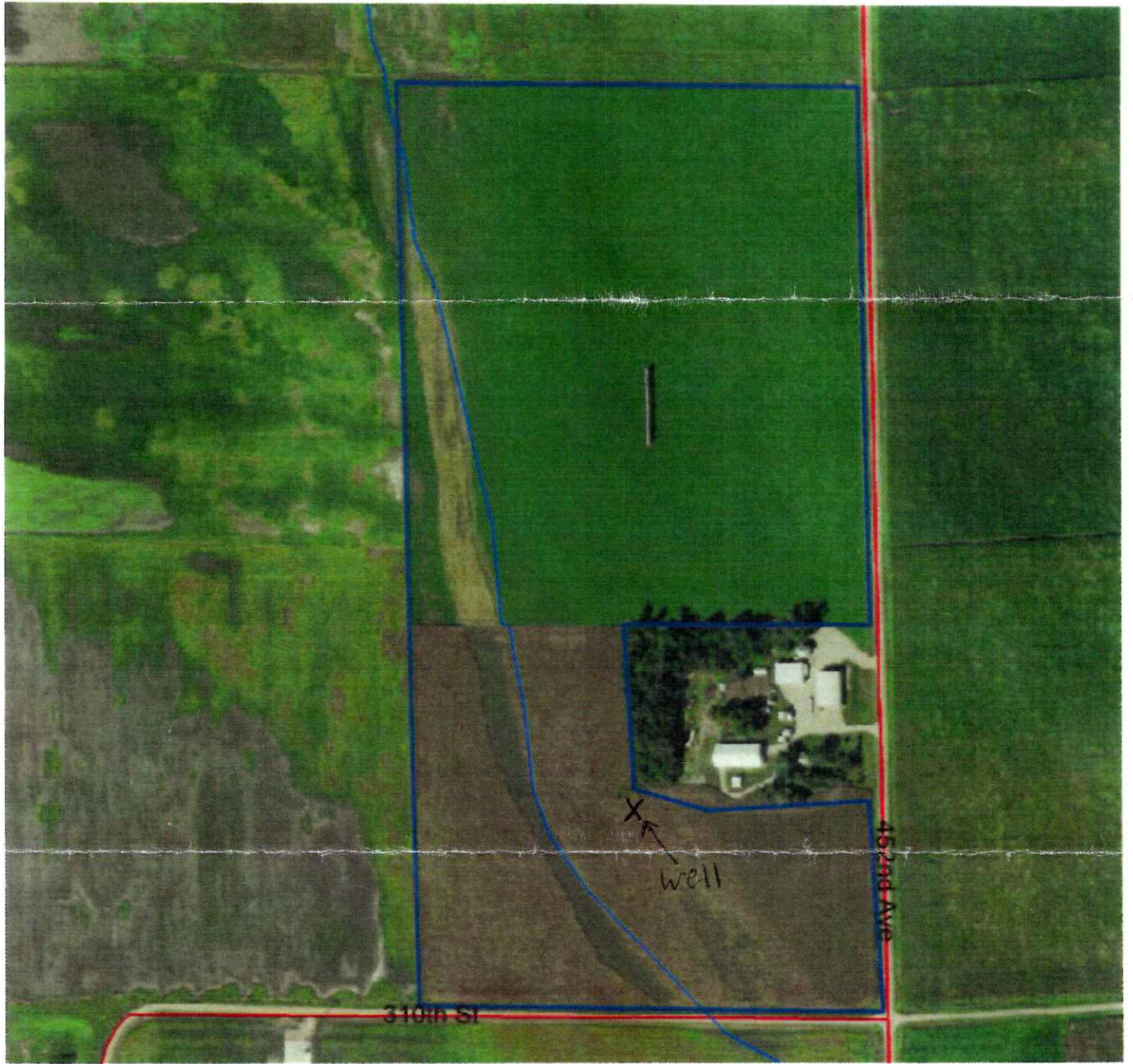
310 ST

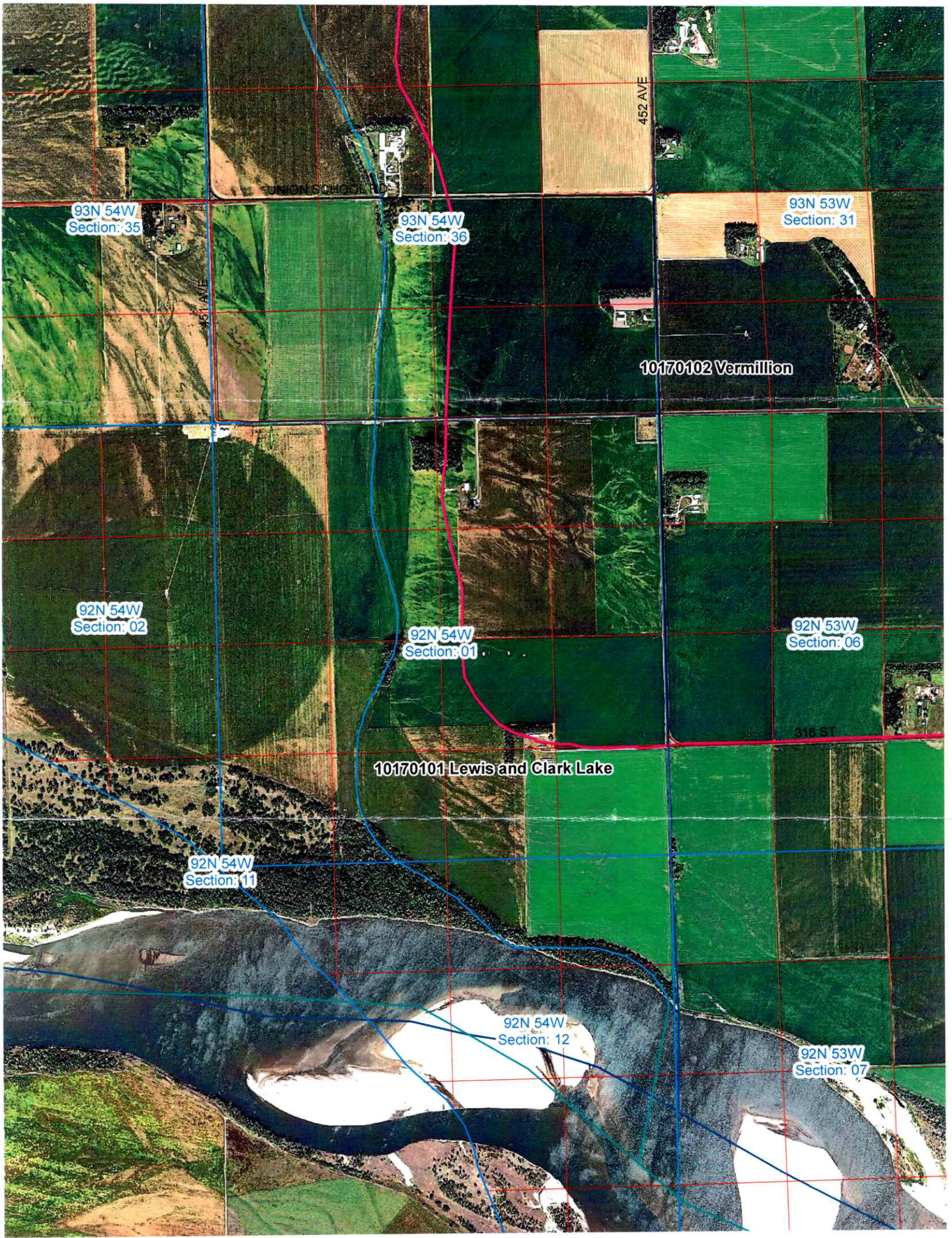
93N 54W
Section: 11

93N 54W
Section: 12

93N 53W
Section: 07

PERKINS ST
RAYBURN AVE
NORTH AVE
KELSON AVE
LONG ST
BIRCHING AVE
IVERTSON ST





93N 54W
Section: 35

93N 54W
Section: 36

93N 53W
Section: 31

10170102 Vermillion

92N 54W
Section: 02

92N 54W
Section: 01

92N 53W
Section: 06

10170101 Lewis and Clark Lake

92N 54W
Section: 11

92N 54W
Section: 12

92N 53W
Section: 07

RECEIPT

WATER RIGHTS PROGRAM South Dakota Department of Agriculture and Natural Resources

Date March 20, 2024

RECEIVED OF Troy Cook 30983 452nd Ave., Gayville SD 57031

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

Fee for Application for Permit No. <u>8847-3</u> to Appropriate Water, to construct and to put water to beneficial use	\$ <u>750.00</u>
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>8847-3</u>	\$ <u>200.00</u>
Fee for Filing Transfer Form _____	\$ _____
Fee for _____	\$ _____
Fee for Issuing New Well Driller's License No. _____	\$ _____
Fee for Renewal of Well Driller's License No. _____	\$ _____
Fee for Issuing Well Pump Installer's License No. _____	\$ _____
Fee for Renewal of Well Pump Installer's License No. _____	\$ _____
(Any Other Work Provided by Law)	TOTAL
	\$ <u>950.00</u>

By *Eric Gronlund*
Chief Engineer
vm



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

RECEIVED

APR 02 2024

**OFFICE OF
WATER**

March 21, 2024

Troy Cook
30983 452nd Avenue
Gayville SD 57031

Dear Mr. Cook:

I am in receipt of your application for a water permit for irrigation. To complete the application, the following items need clarification:

- Your application indicates one well in the SE 1/4 SE 1/4 Section 1 -T92N-R54W and the SE 1/4 SE 1/4 Section 1 -T93N-R54W. Based on the map you provided, it appears to be in Section 93 correct? Enclosed is a map with the well location indicated as a green dot, please correct if the location is incorrect. Is it only one well or two wells in different locations?
- Please outline the acres to be irrigated.
- Please answer the questions highlighted in yellow on Form 2A. If you do not know, it is okay to say unknown.

Once I receive your response, I can begin processing your application.

Sincerely,

Rachel Rodriguez

Rachel Rodriguez
Water Rights Program
605 773-3352
rachel.rodriguez@state.sd.us

enclosures



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 8847-3, Troy Cook**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Agriculture and Natural Resources concerning Water Permit Application No. 8847-3, Troy Cook, 30983 452nd Avenue, Gayville SD 57031.

The Chief Engineer is recommending APPROVAL of Application No. 8847-3 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 domestic water uses and water rights, 3) the proposed use is a beneficial use and 4) it is in the public interest as it pertains to matters of public interest within the regulatory authority of the Water Management Board with the following qualifications:

1. The well approved under Water Permit No. 8847-3 is located near domestic wells and other wells which may obtain water from the same aquifer. Water withdrawals must be controlled 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. 8847-3 must be constructed by a licensed well driller and construction of the well and installation of the pump must 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. Pursuant to SDCL 46-5-6 which allows a greater diversion rate if the method of irrigation, time constraints, or type of soils so requires, Permit No. 8847-3 authorizes a maximum diversion rate of 1.11 cfs for the irrigation of 65 acres with an annual volume not to exceed 2 acre feet of water per acre per year.
4. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

See report on application for additional information.

Eric Gronlund, Chief Engineer
May 28, 2024

Report to the Chief Engineer
On Water Permit Application No. 8847-3

Troy Cook

May 30, 2024

Water Permit Application No. 8847-3 proposes to divert water at a maximum instantaneous diversion rate of 1.11 cubic feet of water per second (cfs) from one well to be completed into the Missouri: Elk Point aquifer (approximately 100 feet deep) located in the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 1 for the irrigation of 65 acres located in the E $\frac{1}{2}$ SE $\frac{1}{4}$ of Section 1; all in T93N-R54W. The applicant is requesting a diversion rate greater than the statutory limit of 1.0 cfs per 70 acres. The site of interest is located in Yankton County approximately one-half mile northeast of Gayville, SD.

AQUIFER: Missouri: Elk Point (M: EP)

HYDROGEOLOGY:

The Missouri: Elk Point aquifer is a glacial outwash deposit consisting of fine sand to very coarse gravel (Niehus, 1997). The Missouri: Elk Point aquifer underlies approximately 219,100 acres in Clay, Union, and Yankton Counties in South Dakota, and the aquifer contains approximately 3,287,100 acre-feet of recoverable water in storage (Hedges et al., 1982). The Missouri: Elk Point aquifer is hydrologically connected to the Lower Vermillion-Missouri and Lower James-Missouri aquifers, and the Big Sioux, James, Missouri, and Vermillion Rivers (Niehus, 1994; Stephens, 1967).

The Missouri: Elk Point aquifer is generally under confined conditions in the northwestern part of the aquifer and unconfined conditions in the southern part of the aquifer, and the direction of groundwater movement in the aquifer is generally from the northwest to the southeast (Niehus, 1994 and 1997).

No water well or test hole completion report was submitted with Water Permit Application No. 8847-3. Water well completion reports on file with the DANR-Water Rights Program for wells completed into the Missouri: Elk Point aquifer within approximately one mile of the proposed diversion point have saturated aquifer thicknesses ranging from approximately 20 to 40 feet, with the depth to the top of aquifer materials ranging from approximately 75 to 90 feet below the ground surface, and static water levels at well completion varying from approximately 10 to 25 feet below the ground surface (Water Rights, 2024d). The Missouri: Elk Point aquifer is expected to be confined at the proposed diversion point based on the well completion reports on file for nearby wells completed into the aquifer but may behave like an unconfined well due to nearby unconfined aquifer conditions in the Missouri: Elk Point aquifer (Water Rights, 2024d).

Figure 1 displays a map of the approximate Missouri: Elk Point aquifer boundary (modified from Hedges et al., 1982) and the location of the proposed diversion point for Water Permit Application No. 8847-3 (Water Rights, 2024c and 2024d).

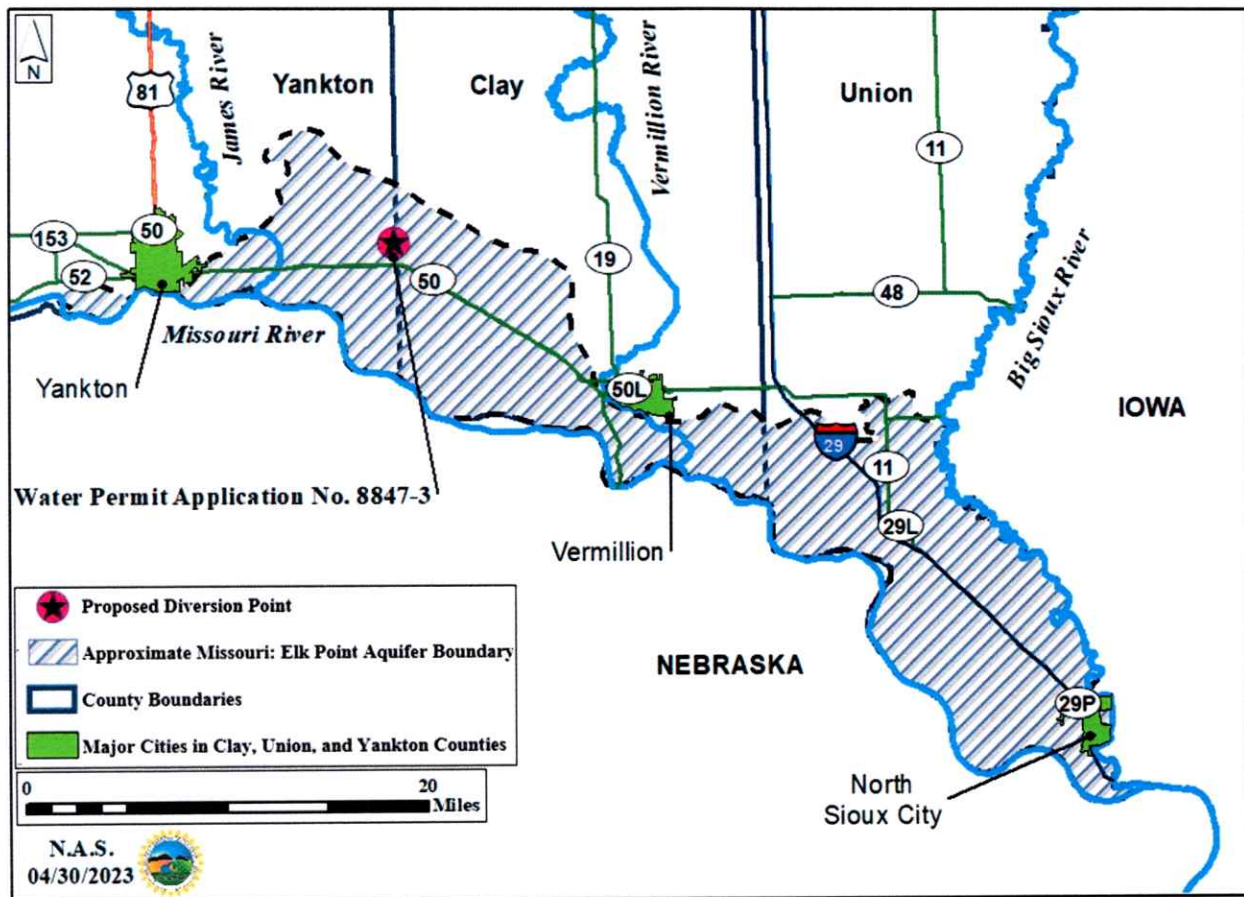


Figure 1. Map of the approximate Missouri: Elk Point aquifer boundary modified from Hedges and others (1982) with the location of the proposed diversion point for Water Permit Application No. 8847-3 (Water Rights, 2024c and 2024d)

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 the applicant’s proposed use, that the diversion point can be developed without unlawful impairment of existing domestic water uses and water rights, and that the proposed use is a beneficial use and in the public interest as it pertains to matters of public interest within the regulatory authority of the Water Management Board as defined by SDCL 46-2-9 and 46-2-11.” This report will address the availability of unappropriated water and the potential for unlawful impairment of existing domestic water uses and water rights within the Missouri: Elk Point aquifer.

WATER AVAILABILITY:

Water Permit Application No. 8847-3 proposes to appropriate water from the Missouri: Elk Point aquifer. The probability of unappropriated water being 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. An application may be approved, however, for withdrawals of groundwater from any groundwater formation older than or stratigraphically lower than the greenhorn formation in excess of the average estimated annual recharge for use by water distribution systems.” The Missouri: Elk Point aquifer is not older than or stratigraphically lower than the Greenhorn Formation (Fahrenbach et al., 2010), and the applicant’s proposed use is not for use in a water distribution system as defined by SDCL 46-1-6(17). Therefore, the average annual recharge and average annual withdrawal rates to and from the Missouri: Elk Point aquifer must be considered.

HYDROLOGIC BUDGET:

Recharge

Recharge to the Missouri: Elk Point aquifer is primarily through the infiltration of precipitation where the aquifer is at or near the ground surface, seepage from the Big Sioux, James, Missouri, and Vermillion Rivers, inflow from the Lower Vermillion-Missouri and Lower James-Missouri aquifers at the northern boundary of the Missouri: Elk Point aquifer and inflow from the Big Sioux aquifer at the extreme northeastern boundary of the Missouri: Elk Point aquifer, and from the underlying Dakota aquifer in Union County (Condley and Lamkey, 2022; Niehus, 1994 and 1997).

Several studies have been completed to estimate average annual recharge to the Missouri: Elk Point aquifer (Condley and Lamkey, 2022; Hedges et al., 1985; Mathiowetz, 2022; Stephens, 1967; Stonesifer, 2013). A discussion of these studies is available in the hydrologic budget section within the report for Water Permit No. 8614-3 - Lewis & Clark Regional Water System completed by Mathiowetz (2022). Collectively, the estimated average annual recharge rate to the Missouri: Elk Point aquifer is approximately 130,770.3 acre-feet per year assuming full development of the existing future use and water rights/permits currently held by Lewis & Clark Regional Water System (Mathiowetz, 2022 and 2023).

Discharge

Discharge from the Missouri: Elk Point aquifer is primarily through well withdrawals, evapotranspiration where the aquifer is at or near the ground surface, outflow to the Big Sioux and Missouri Rivers during periods of low flow and stage, and leakage to the underlying Dakota aquifer (Niehus, 1994 and 1997; Water Rights, 2024d).

Currently, there are 653 water rights/permits authorized to appropriate water from the Missouri: Elk Point aquifer, plus six future use permits reserving water, and two pending applications – Water Permit Application No. 8844-3 requesting an amount of water not to exceed 3.68 acre-feet annually for commercial and industrial uses and Water Permit Application No. 8850-3 requesting to irrigate 64 acres in Yankton County.

The six future use permits (Nos. 5832-3, 6237-3, 6869-3, 6869A-3, 7208-3, and 8754-3) are reserving 21,021 acre-feet of water annually from the Missouri: Elk Point aquifer (Water Rights,

2024c). For the purpose of estimating average annual withdrawals, the future use permits are assumed to be fully developable for a total of 21,021 acre-feet per year.

Table 1 summarizes the 44 non-irrigation water rights/permits (including two irrigation water permits, see paragraph below) (including one pending application) authorized to appropriate water from the Missouri: Elk Point aquifer with the estimated annual use for each water right/permit as determined by their limiting diversion rate or annual volume. Historically, average water use by non-irrigation appropriations limited by an instantaneous diversion rate have been assumed to be pumping 60% of full time at their respective permitted diversion rate. Water rights/permits limited by an annual volume are assumed to withdraw their entire respective annual volume limitation. This is a standard method used by the DANR-Water Rights Program for estimating annual withdrawals by non-irrigation appropriations from an aquifer (Water Rights, 2024c). This method is likely an overestimation of withdrawals. Three municipal water rights were identified as being connected to a rural water system and likely maintain their wells for standby purposes (Drinking Water Program, 2024; Water Rights, 2024c); as such, the average annual water use for these water rights has been estimated to be zero acre-feet per year on Table 1.

Water Right No. 5437-3 was licensed for a reduced diversion rate which prevents pumping the allotted volume of water specified on the permit (Water Rights, 2024c). The estimated average annual withdrawal rate for Water Right No. 5437-3 was approximated assuming pumping 60% of full time at the respective licensed diversion rate method as mentioned above on Table 1.

Water Permit No. 5998-3 is permitted for the irrigation of turf and Water Permit No. 5998A-3 extends the amount of time allowed for water to be put to beneficial use as authorized by Water Permit No. 5998-3 (Water Rights, 2024c). The estimated use for these two irrigation permits is included with the non-irrigation water rights/permits listed on Table 1, as the permit holder is not required to submit an annual irrigation questionnaire. However, Water Permit No. 5998-3 is authorized for use in a rural water system and the permit holder reports the annual use by Water Permit No. 5998-3 with their other rural water system Missouri: Elk Point aquifer permits, listed on Table 2 (Water Rights, 2024c).

Water Permit No. 7059-3 is permitted for recreational use for maintaining the water level of a small lake with a surface area of 17.6 acres (Water Rights, 2024c). It is assumed that the only consumptive use of this water is due to evaporation; however, it is likely there is some seepage through the bottom of the pond (Water Rights, 2024c). Annual evaporation of water from shallow lakes is estimated to be approximately 42 inches per year at the location of the authorized diversion point for Water Permit No. 7059-3 (NOAA, 1982; Water Rights, 2024c), and normal annual total precipitation at the Sioux City, Iowa airport was determined to be approximately 29.27 inches over a 30-year period of record (1991 to 2020) (Arguez et al., 2020), which results in the lake to fluctuate approximately 12.73 inches per year. To maintain the water level of the small lake, the estimated use of Water Permit No. 7059-3 is approximately 18.7 acre-feet per year. Overall, the average annual withdrawal rate for the 44 non-irrigation water rights/permits (including the two irrigation permits not required to submit an annual irrigation questionnaire) (including one pending application) authorized to appropriate water from the

Missouri: Elk Point aquifer is approximately 69,385 acre-feet per year (Table 1) (Water Rights, 2024c and 2024f).

Table 1. Estimated annual use for the non-irrigation water rights/permits (plus two irrigation water permits for Clay RWS) authorized to divert water from the Missouri: Elk Point aquifer (Drinking Water Program, 2024; Water Rights, 2024c and 2024f)

Permit No.	Name	Status	Priority Date	Use	Authorized Diversion Rate (cfs)	Authorized Annual Volume (acre-feet/year)	Total Estimated Use (acre-feet/year)
4501-3	Eddie Wohl	LC	03/27/1980	COM	0.05		21.7
5616-3	Cimpls Inc	LC	01/31/1992	COM	0.44		191.2
5827-3	Don Lantis	LC	06/08/1994	COM	0.022		9.6
5953-3	H & K Oil Co	LC	08/19/1996	COM	0.037		16.1
6151-3	Vernon & Norma Vakoc	LC	10/04/1999	COM	0.67		291
6580-3	West Shores Acres LLC	LC	01/28/2005	COM	0.10		43.5
8031-3	Dakota Protein Conversion Inc	PE	06/18/2014	COM	0.22		95.6
8147-3	Doug Lafleur	PE	04/06/2015	COM, LCO	1.0	160	159
8381-3	RP Constructors	PE	11/19/2018	COM	0.04	1	1
8403-3	Stockmen's Livestock Inc	LC	06/27/2019	COM	1.06	40	40
8415-3	3 Sons Properties	PE	11/14/2019	COM	0.10	25	25
8435-3	Sioux City Insulation	PE	07/30/2012	COM	0.33	1	1
8844-3	GrowMark Inc	Pending	03/22/2024	COM, IND	0.67	3.68	3.68
7388-3	Clay RWS Inc	PE	07/30/2012	DOM, IRR	2.0		349
5998-3	Clay RWS Inc	PE	04/21/1997	IRR, DOM	2.2		
5998A-3	Clay RWS Inc	PE	04/21/1997	IRR, DOM	0.0		
5490-3	USGS CERC Field Research Station	LC	11/15/1990	FWP	0.09		39.1
5907-3	US Fish and Wildlife Service	LC	01/26/1996	FWP	3.78		1,643
6733-3	US Fish and Wildlife Service	LC	06/07/2006	FWP	1.11		482.5
7094-3	US Fish and Wildlife Service	LC	12/01/2008	FWP	2.67		1,160
5021-3	Vishay-Dale Electronics Inc	LC	05/04/1984	IND	0.10		43.5
5388-3	LG Everist Inc	LC	01/30/1990	IND	0.45		195.6
5453-3	AaLadin Industries Inc	LC	05/24/1990	IND	0.05		21.7
5593-3	Vishay-Dale Electronics Inc	LC	10/31/1991	IND	0.056		24.3
6170-3	Knife River	LC	01/03/2000	IND	0.222		96.5
1255-3	City of Elk Point	LC	01/01/1914	MUN	1.13		491.1
143-3	City of Vermillion	LC	01/21/1956	MUN	1.78		773.7
147-3	City of Vermillion	LC	01/01/1935	MUN	2.66		1,245
6236-3	City of Vermillion	LC	11/06/2000	MUN	2.6	1,161	
6354-3	City of Vermillion	LC	08/12/2002	MUN	0.022		10
1965-3	Town of Gayville	LC	01/01/1914	MUN	0.37		0*
4207-3	Town of Jefferson	LC	01/01/1916	MUN	0.90		391
5118-3	Town of Gayville	LC	01/28/1987	MUN	0.33		0*
5437-3	Dakota Dunes Community Improvement District	LC	04/12/1990	MUN	3.33		1,447
5782-3	City of North Sioux City	LC	08/12/1993	MUN	1.14		495.5
8212-3	City of Yankton	LC	03/25/2016	MUN	20.12	6,050	6,050
7059-3	WE Investments LLC	PE	08/28/2008	REC	3.11		18.7
8744-3	Dakota Bay	PE	03/29/2023	REC	1.55	28.6	28.6
6736-3	Lewis and Clark RWS	PE	07/08/1994	RWS	27.85	20,165	53,442
7207-3	Lewis and Clark RWS	PE	07/08/1994	RWS	20	12,000	
8613-3	Lewis and Clark RWS	PE	07/16/2007	WDS	29.8	13,000	
8614-3	Lewis and Clark RWS	PE	03/04/2022	RWS	0.0	8,277	
5581-3	Larson's Landing	LC	07/30/1991	SHD	0.089		38.7
5592-3	East Winds Court Inc	LC	10/09/1991	SHD	0.11		0*
						TOTAL:	69,385

*Identified as being connected to a RWS; therefore, water use from aquifer is presumed to be zero acre-feet/year

COM: Commercial; DOM: Domestic; FWP: Fish and Wildlife Propagation; IND: Industrial; IRR: Irrigation; LCO: Livestock Confinement Operation; MUN: Municipal; REC: Recreation; RWS: Rural Water System; SHD: Suburban Housing Development

Of the 44 non-irrigation water rights/permits (including the two irrigation permits not required to submit an annual irrigation questionnaire), there are 16 non-irrigation water rights/permits that are required to report their annual usage from the Missouri: Elk Point aquifer (Water Rights, 2024c and 2024f).

Four of the non-irrigation water rights/permits that are required to report (Nos. 8031-3, 8415-3, 8435-3, and 8614-3) are currently under development (or were approved in 2023) and have not reported any withdrawals from the Missouri: Elk Point aquifer to the DANR-Water Rights Program (Water Rights, 2024c). The remaining twelve non-irrigation water rights/permits that are required to report their annual usage from the Missouri: Elk Point aquifer are shown on Table 2 (Water Rights, 2024c and 2024f). The reported usage (as shown on Table 2) for Permit Nos. 8381-3 and 8403-3 (approved in 2018 and 2019) is not necessarily reflective of the future usage of these permits based on information within their respective water permit files (Water Rights, 2024c), and only four years of reported withdrawals (Water Rights, 2024f). Therefore, the estimated use for Permit Nos. 8031-3, 8415-3, 8435-3, 8381-3, 8403-3, and 8614-3 will be based on the method used above: water rights/permits limited by an instantaneous diversion rate have been assumed to be pumping 60% of full time at the respective permitted diversion rate; water rights/permits limited by an annual volume are assumed to withdraw their entire respective annual volume limitation. The estimated average annual withdrawal rate for these permits is listed on Table 1.

The reported use for the City of Yankton (8212-3) and Lewis and Clark Regional Water System (6736-3, 7207-3, and 8613-3) (as shown on Table 2) is steadily increasing (Water Rights, 2024f), as these water users are continually undergoing development (8614-3 was approved in 2023) (Water Rights, 2024c). It is likely these water users will use their entire respective annual volume limitation in the future; therefore, the average annual withdrawal rate for these water rights/permits is assumed to be their entire respective annual volume listed on Table 1 (Water Rights, 2024c).

The annual withdrawal rate for Clay Rural Water System Inc (Permit Nos. 5998-3, 5998A-3, and 7388-3) averaged over the last ten years (approximately 349 acre-feet per year) is more reflective of current usage than the entire period of record of reported withdrawals because the first few years the permit holder reported values were during a construction period (Water Rights, 2024c and 2024f). The average annual withdrawal rate based off the reported annual withdrawal rates averaged from 2013 to 2022 on Table 2 for these water permits will be used in this analysis.

The annual withdrawal rates for Doug Lafleur (8147-3) and City of Vermillion (147-3, 6236-3) on Table 2 are relatively steady over their respective periods of record (Water Rights, 2024c and 2024f); therefore, the average annual withdrawal rate based on the reported values from each of these water users (as shown on Table 2) is reasonably reflective of the future withdrawals likely to be made by these appropriative users. The average annual withdrawal rate based off the reported annual withdrawal rates averaged over the period of record on Table 2 for these water rights/permits will be used in this analysis.

Table 2. Non-irrigation water rights/permits required to report their respective annual use from the Missouri: Elk Point aquifer (Water Rights, 2024c and 2024f)

	RP Constructors	Stockmen's Livestock Inc	Clay RWS Inc	Doug Lafleur	City of Vermillion	City of Yankton	Lewis and Clark RWS
	8381-3	8403-3	5998-3, 5998A-3, 7388-3	8147-3	147-3, 6236-3	8212-3	6736-3, 7207-3, 8613-3
2003			238		1,363		
2004			483		1,226		
2005			21		1,247		
2006			170		1,252		
2007			217		1,344		0
2008			213		1,199		0
2009			215		1,140		0
2010			183		1,071		0
2011			137		1,127		92
2012			525		1,317		3,836
2013			301		1,183		9,368
2014			307		1,121		11,532
2015			278	202	1,161		15,591
2016			231	202	1,175	66	17,091
2017			276	202	1,215	531	18,051
2018			305	98	1,168	504	18,143
2019	0.0171	1	292	135	1,440	1,370	20,397
2020	0.0224	4.2	461	121	1,373	2,923	21,039
2021	0.2332	5.5	486	170	1,378	3,065	23,537
2022	0.0252	5.7	550	142	1,394	3,405	24,693
Max	0.2	5.7	550	202	1,440	3,405	24,693
Min	0.0171	1	21	98	1,071	66	0
Avg	0.074	4.10	294	159	1,245	1,695	15,281 *
RWS: Rural Water System *Excluded reported zero values							

Currently, there are 612 irrigation water rights/permits authorized to appropriate water from the Missouri: Elk Point aquifer, plus one pending application (Water Rights, 2024c). Irrigation water rights/permits have been typically required to report their annual usage on an irrigation questionnaire since 1979. The estimated average annual withdrawal rate for the Missouri: Elk Point aquifer irrigation water rights/permits that have reported over the period of record (1979 to 2022) is approximately 19,299 acre-feet per year (Table 3) (Water Rights, 2024a). To reflect the current development of irrigation water rights/permits more accurately, the average annual withdrawal rate for irrigation appropriations from 2013 to 2022 is approximately 26,040 acre-feet per year (Table 3) (Water Rights, 2024a).

The usage for two irrigation water permits (Nos. 5998-3 and 5998A-3) was accounted for on Table 1 with the non-irrigation water rights/permits, as the permit holder is not required to report their respective annual irrigation usage (Water Rights, 2024c), resulting in only 610 of the Missouri: Elk Point aquifer irrigation water rights/permits being currently required to submit an annual irrigation questionnaire (Water Rights, 2024c).

Additionally, Water Right No. 6110-3 is authorized to divert water from a well completed into the Dakota aquifer and pump the water into two ponds that receive incidental surface runoff and possible groundwater inflow from the Missouri: Elk Point aquifer (Water Rights, 2024c). Water Right No. 6110-3 is included in the 612 irrigation water rights/permits authorized to appropriate water from the Missouri: Elk Point aquifer; however, the estimated use for this permit is assumed to be negligible to the overall hydrologic budget due to the minimal amount of water from the Missouri: Elk Point aquifer the permit holder is expected to withdraw. When omitting Water Right No. 6110-3 and Water Permit Nos. 5998-3 and 5998A-3 from this analysis of Missouri: Elk Point aquifer irrigation water rights/permits, 609 water rights/permits remain.

Table 3 lists only 579 water rights/permits as reporting in 2022 (Water Rights, 2024a and 2024c). These 579 water rights/permits listed as reporting in 2022 includes seven water rights/permits (Nos. 237-3, 4762-3, 6901B-3, 6939-3, 7319-3, 7635-3, and 7801-3) that were incorporated into another water right or cancelled in 2022, 2023, or 2024 (Water Rights, 2024c), resulting in only 572 of the water rights/permits listed as reporting in 2022 being currently active.

Additionally, Water Right/Permit Nos. 3127-3, 6458-3, and 7608-3 were each divided into two separate water permits to reflect the new ownership change (Water Rights, 2024c), resulting in the 572 permits to become 575 currently active permits.

Thirty-four water permits/rights did not submit an irrigation questionnaire form in 2022 that are currently active, accounting for the difference between the 575 currently active water rights/permits listed as reporting in 2022 and the 609 irrigation water rights/permits currently required to submit an annual irrigation questionnaire and annual use being estimated in this analysis (Water Rights, 2024a and 2024c). Of these 34 permits, 33 were issued in 2022, 2023, or 2024 and have not submitted an irrigation questionnaire at this time. The remaining permit, Water Right No. 5935-3, is not required to submit an irrigation questionnaire. Overall, these 34 water permits/rights are authorized to irrigate approximately 2,409 acres (Water Rights, 2024c).

Table 3. Reported historic irrigation use from Missouri: Elk Point aquifer (Water Rights, 2024a)

Year	No. of Permits Reporting	Reported Pumpage (acre-feet)
1979	259	10,258
1980	263	14,937
1981	297	13,931
1982	269	19,143.1
1983	273	11,081
1984	281	9,605.5
1985	282	14,020.7
1986	286	6,324.8
1987	281	13,369
1988	282	28,558.1
1989	292	25,904.3
1990	297	19,508
1991	300	18,877.7
1992	295	1,895
1993	298	1,475.2
1994	295	10,314.9
1995	292	18,761.3
1996	296	9,473.6
1997	305	17,236
1998	313	11,079.5
1999	308	14,877
2000	309	26,551
2001	313	19,115.2
2002	315	23,326.9
2003	314	27,007
2004	322	24,309
2005	335	24,206.1
2006	353	27,943.3
2007	366	30,652
2008	396	16,439
2009	410	6,346
2010	419	2,906.9
2011	431	12,330
2012	445	56,994.7
2013	543	35,090.5
2014	557	12,423.5
2015	563	17,884.1
2016	564	27,869.3
2017	567	37,209.9
2018	570	9,160.7
2019	575	8,736.3
2020	570	26,601
2021	572	40,503.4
2022	579	44,925
Min	259	1,475.2
Max	579	56,994.7
Avg (1979 to 2022)	374	19,299
Avg (2013 to 2022)	566	26,040

Farmer (2018a, 2018b, and 2021) analyzed the amount of water pumped per permitted acre for the period from 1979 through 2005. This period was chosen due to the relatively stable number of permitted acres across the entire period. There was a continual annual increase in the number of permitted acres from 2006 through 2013/2014. From 2013/2014 through 2021, the total number of permitted acres had been relatively stable (Mathiowetz, 2022; Water Rights, 2024c). Farmer (2021) determined that it would be best to separate the review of pumpage per permitted acres between crops, such as corn and soybeans, and turf, such as golf courses and lawn irrigation, to describe the pumpage more accurately per permitted acres. Turf irrigation typically requires more water per acre annually than crop irrigation. Mathiowetz (2022) determined over the entire period of record (1979 through 2021), the crop application rate per permitted acre is 0.331 feet per year (3.97 inches per year), and 0.908 feet per year for turf (10.9 inches per year) (Water Rights, 2024a and 2024c).

Currently, there are 83,040.5 acres authorized to be irrigated from the Missouri: Elk Point aquifer (plus pending Water Permit Application No. 8850-3 proposing to crop irrigate 64 acres), with 819.6 of those acres authorized for turf irrigation (Water Rights, 2024c). Table 4 contains the turf irrigation permits with their respective authorized permitted acres and an estimated average annual use based on Mathiowetz's (2022) application rate per permitted acre (Water Rights, 2024c). By multiplying the application rate of 0.908 feet per acre per year (Mathiowetz, 2022), by the 819.6 acres being turf irrigated (Water Rights, 2024c), the annual use for turf irrigation yields approximately 744.2 acre-feet per year (Table 4). By multiplying the application rate of 0.331 feet per acre per year (Mathiowetz, 2022), by the 82,220.9 acres (total acres minus turf irrigated acres) acres being crop irrigated (Water Rights, 2024c), plus the pending application requesting to crop irrigate 64 acres, the annual use for crop irrigation yields approximately 27,236.3 acre-feet per year. Collectively, the average annual use from the Missouri: Elk Point aquifer for both crop and turf irrigation water rights/permits utilizing Mathiowetz's (2022) application rates is approximately 27,980.5 acre-feet per year.

Table 4. Water rights/permits authorized for irrigation of turf (Water Rights, 2024c)

Permit No.	Name	Status	County	Acres	Total Estimated Use (acre-feet/year)
1294-3	Recreation Development Assn. Inc.	LC	Union	102	92.6
2011-3	TR Golf LLC	LC	Union	95	86.3
5786-3	Dakota Dunes Golf Course	LC	Union	173	157.1
5998-3	Clay Rural Water System Inc	PE	Union	300	272.4
5998A-3	Clay Rural Water System Inc	PE	Union	0	0
5935-3	Ted Waitt	LC	Union	1	0.908
5936-3	Applied Engineering	LC	Yankton	1.8	1.6
8010-3	Ryan Rusher	LC	Yankton	2.5	2.3
8029-3	Dakota Dunes Comm Improvement District	PE	Union	17.8	16.2
8040-3	Heine Electric & Irrigation Inc	LC	Clay	1	0.908
8354-3	TR Golf LLC	PE	Union	30	27.24
8407-3	Gayville-Volin School District 63-1	LC	Yankton	4.5	4.1
8530-3	National Field Archery Association Foundation	LC	Yankton	16	14.5
8560-3	TR Golf LLC	PE	Union	65	59
8727-3	TR Golf LLC	PE	Union	10	9.1
			TOTAL:	819.6	744.2

There are domestic wells completed into the Missouri: Elk Point aquifer that do not require a water right/permit, so the withdrawal amount from those wells is unknown (Water Rights, 2024d). Due to their relatively low diversion rates, withdrawals from domestic wells are not considered to be a significant portion of the hydrologic budget. Additionally, with the development of rural water systems in areas where the Missouri: Elk Point aquifer is the uppermost aquifer available; it is likely some domestic users may have transitioned to rural water. Therefore, the quantity of water withdrawn by domestic wells is estimated to be negligible to the hydrologic budget for the Missouri: Elk Point aquifer.

Hydrologic Budget Summary

The average annual recharge rate to the Missouri: Elk Point aquifer is approximately 130,770.3 acre-feet per year.

The estimated average annual withdrawal rate for the water rights/permits authorized to appropriate water from the Missouri: Elk Point aquifer totals approximately 118,408 acre-feet per year (including the estimated use for Water Permit Application Nos. 8844-3, 8847-3, and 8850-3, if approved) (listed on Table 5) - with an average annual recharge rate of approximately 130,770.3 acre-feet per year. Based on the hydrologic budget, there is a reasonable probability unappropriated water is available from the Missouri: Elk Point aquifer for the proposed appropriation.

Table 5. Estimated use from Missouri: Elk Point aquifer (Water Rights, 2024a, 2024c, and 2024f)

Type of Water Right/Permit	Estimated Use (acre-feet/year)
Future Use Reservations	21,021
Non-Irrigation (including pending Water Permit App No. 8844-3, if approved)	69,385
Irrigation (Mathiowetz's (2022) turf and crop application rates) (including pending Water Permit App No. 8850-3, if approved)	27,980.5
Application No. 8847-3 (if approved, assuming Mathiowetz's (2022) crop application rate of 0.331 per acre)	21.52
TOTAL:	118,408

OBSERVATION WELL DATA:

Administrative Rule of South Dakota (ARSD) 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.

Observation wells provide data on how the aquifer reacts to regional climatic conditions and local pumping. The DANR-Water Rights Program monitors 36 observation wells completed into the Missouri: Elk Point aquifer (Water Rights, 2024b). The three closest observation wells to the proposed diversion point are YA-78J (approximately 3.9 miles west), YA-80KA (approximately 4.7 miles southwest), and YA-80JA (approximately 5.4 miles northwest) (Water Rights, 2024b). The hydrographs for these observation wells are displayed in Figures 2 to 4 (Water Rights, 2024b). The data points utilized to construct the hydrographs are measurements of the static water level in the observation wells from the top of the well casing.

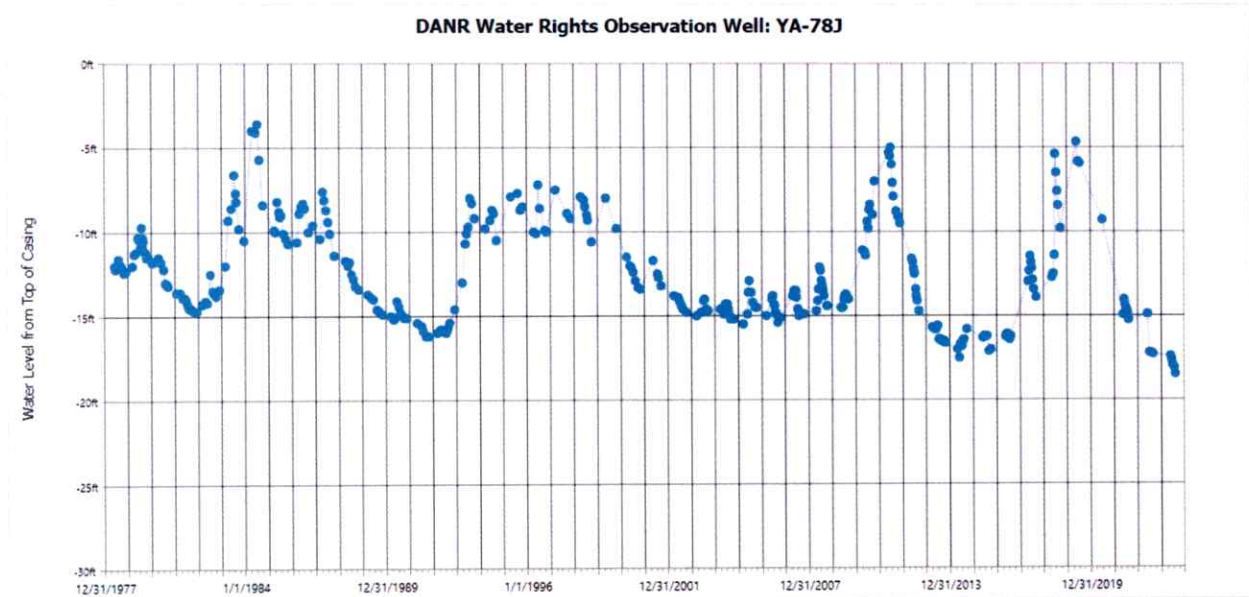


Figure 2. Hydrograph for observation well YA-78J (Water Rights, 2024b)

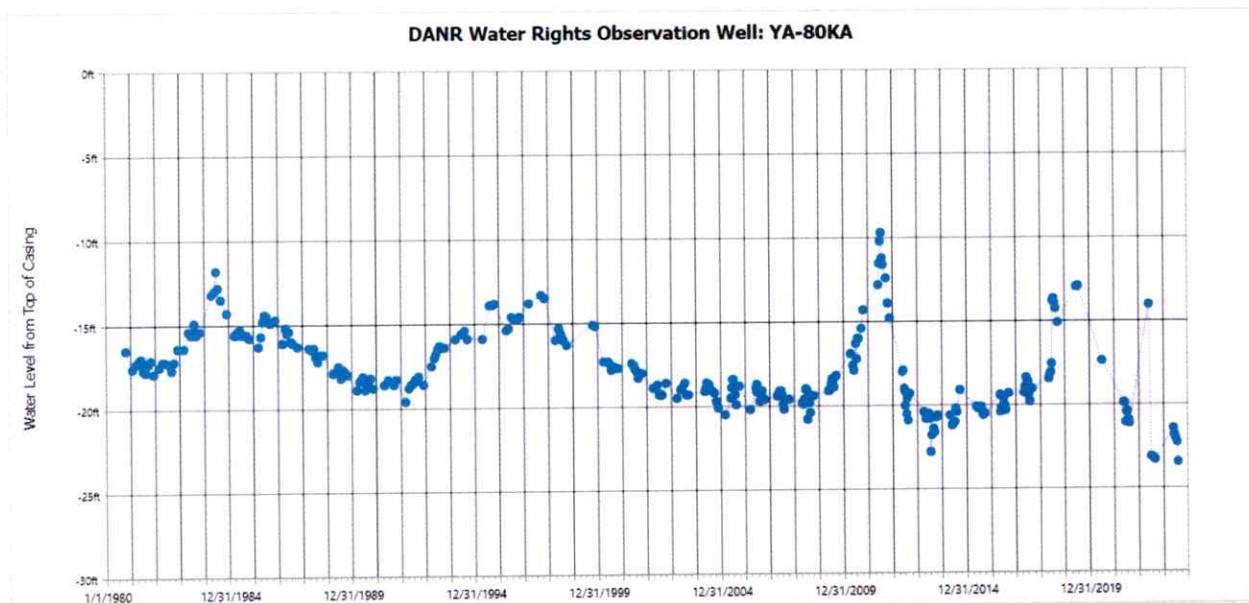


Figure 3. Hydrograph for observation well YA-80KA (Water Rights, 2024b)

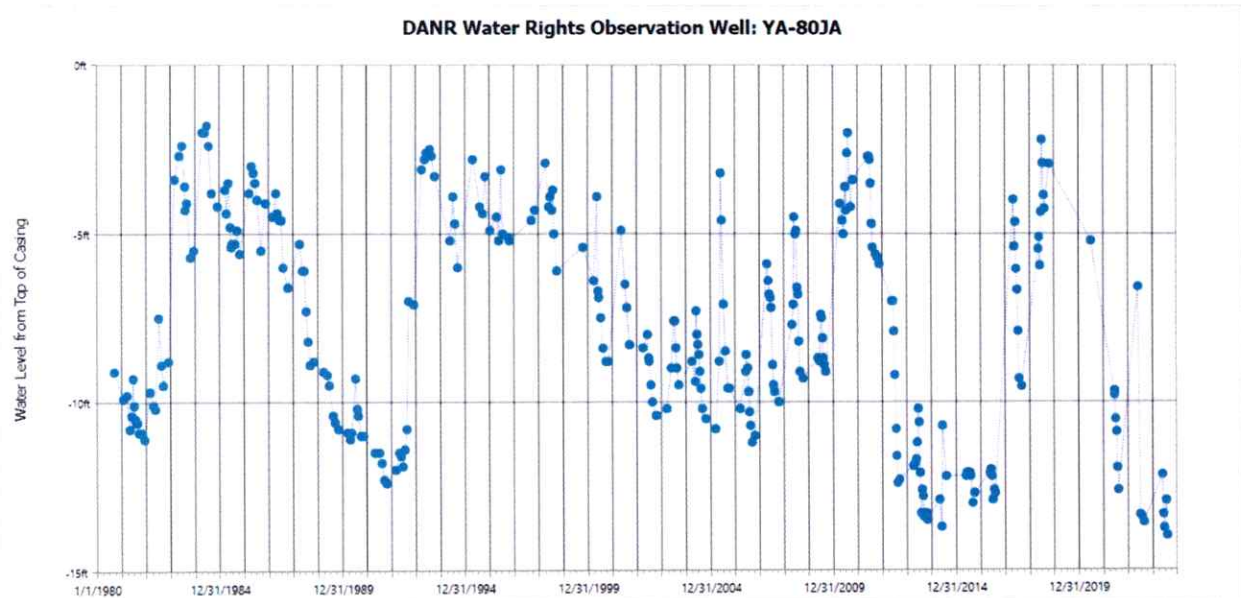


Figure 4. Hydrograph for observation well YA-80JA (Water Rights, 2024b)

The hydrographs for these observation wells were compared to hydrographs for other observations wells completed into the Missouri: Elk Point aquifer and all displayed a generally similar trend as shown on the hydrographs displayed in Figures 2 to 4 (Water Rights, 2024b), except for several Missouri: Elk Point aquifer observation wells close to the Missouri River whose respective hydrographs show a gradual long-term downward trend (Water Rights, 2024b). This downward trend is caused by entrenchment of the Missouri River riverbed and in some places a widening of the channel leading to lower water levels despite the river having the same rate of flow (Elliott and Jacobson, 2022). The lowering of the water level in the Missouri River downstream of the Gavins Point Dam and the subsequent lowering of the water level of Missouri: Elk Point aquifer observation wells in close proximity to the river show the strong hydrologic connection between the Missouri River and the Missouri: Elk Point aquifer. This is demonstrated by the very similar water levels between the aquifer and river as shown in the hydrographs in Figures 2 to 5. The lowering of the water levels in the aquifer, especially in close proximity to the Missouri River, is not a sign of over appropriation of the Missouri: Elk Point aquifer.

To demonstrate the connection between the aquifer and the Missouri River, consider the United States Geological Survey (USGS) Stream Gage #06467500, located on the Missouri River at Yankton, SD, and the hydrograph for this gage is shown in Figure 5 (USGS, 2024). By comparing the hydrograph for Stream Gage #06467500 to the observation well hydrographs of the Missouri: Elk Point aquifer (Figures 2 to 4), both show the river and aquifer react to climatic conditions by rising and falling over similar trends (USGS, 2024; Water Rights, 2024b). Additionally, during flood events (such as, the years 2011 and 2019), the water level in the Missouri: Elk Point aquifer, especially where in closer proximity to the Missouri River, rises very quickly beyond what is typically seen for glacial outwash aquifers that are only responding to the infiltration of precipitation (Water Rights, 2024b). This indicates there is a hydrologic connection between the Missouri: Elk Point aquifer and the Missouri River. Therefore, when the

elevation of the water in the Missouri River is higher than the elevation of water in the aquifer, the river will recharge the aquifer. In contrast, when the elevation of water is higher in the Missouri: Elk Point aquifer, the aquifer naturally discharges to the Missouri River. The observation well water levels simply show the connection between the river and the aquifer and how the aquifer reacts to climatic conditions without showing any long-term effects from pumping. Therefore, there is a reasonable probability unappropriated water is available for this proposed appropriation.

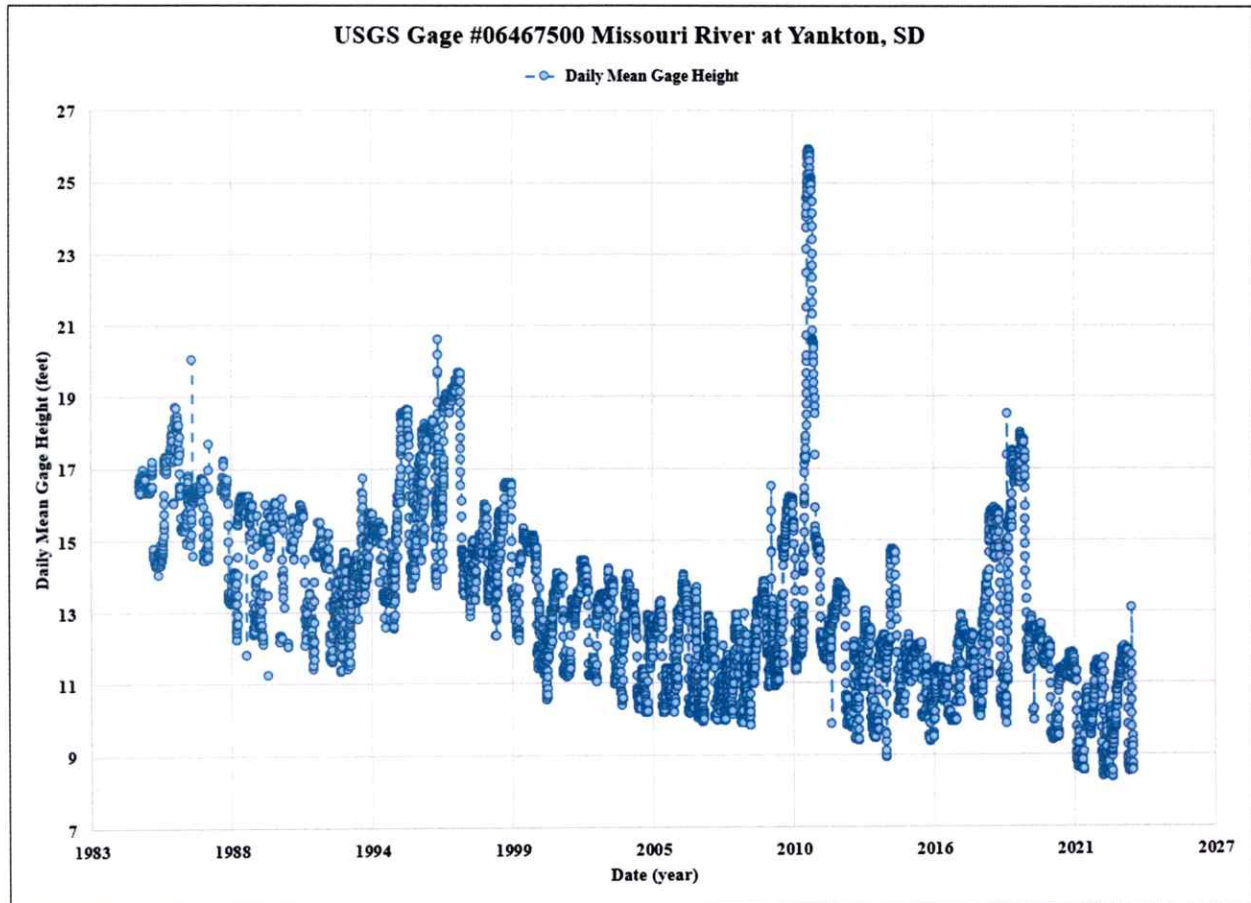


Figure 5. Hydrograph for USGS Stream Gage #06467500 Missouri River at Yankton, SD from 1985 to 2024 (USGS, 2024)

POTENTIAL FOR UNLAWFUL IMPAIRMENT OF EXISTING WATER RIGHTS:

Currently, there are 653 water rights/permits authorized to appropriate water from the Missouri: Elk Point aquifer, plus six future use permits and two pending applications (Water Rights, 2024c). The closest water rights/permits to the proposed diversion point are Water Right Nos. 6648-3, 7693-3, and 8407-3, which are held by Freeburg Limited Partnership, Ricky Bye, and Gayville-Volin School District. The diversion points for Water Right Nos. 6648-3, 7693-3, and 8407-3 are each located approximately 0.4 miles south, northeast, and southwest of the proposed diversion point for this application (Table 6) (Figure 6) (Water Rights, 2024c).

There are domestic wells on file with the DANR-Water Rights Program that are completed into the Missouri: Elk Point aquifer, with the closest domestic well on file (not held by the applicant) located approximately one mile northwest of the proposed diversion point (Water Rights, 2024d). There could potentially be other domestic wells completed into the Missouri: Elk Point aquifer near the proposed diversion point that are not on file with the DANR-Water Rights Program. The location of the domestic wells in the well completion report database maintained by the Water Rights Program is based on the location listed by the driller on the well completion report.

Table 6. Water rights/permits authorized to withdraw water from the Missouri: Elk Point aquifer within approximately two miles of the proposed diversion point, as shown in Figure 6 (Water Rights, 2024c)

Permit No.	Name	Status	Use	Authorized Acres if IRR	Authorized Diversion Rate (cfs)
1965-3	Town of Gayville	LC	MUN		0.37
4613-3	DA Olson & Sons	LC	IRR	148	2
4700-3	DA Olson & Sons	LC	IRR	136	1.94
5118-3	Town of Gayville	LC	MUN		0.33
6648-3	Freeburg Limited Partnership	LC	IRR	117	1.56
6967-3	Erickson Bye Farms	LC	IRR	253	2
7240-3	James A Herzog	LC	IRR	135	1.78
7389A-3	Wade A Larson	LC	IRR	137	1.6
7458-3	Jim Bye	LC	IRR	246	2.22
7593-3	Ricky Bye	LC	IRR	105	1.5
7687-3	Nicholas Olson	LC	IRR	67	1
7936-3	Donald Johnson	LC	IRR	308	2.95
8023-3	Double Down Farm GP c/o Farmland Opp LLC	LC	IRR	290	1.89
8024-3	Double Down Farm GP c/o Farmland Opp LLC	LC	IRR	223	3.36
8325-3	Double Down Farm GP c/o Farmland Opp LLC	LC	IRR	136	1.67
8407-3	Gayville-Volin School District 63-1	LC	IRR	4.5	0.114
LC: Licensed Water Right; IRR: Irrigation; MUN: Municipal					

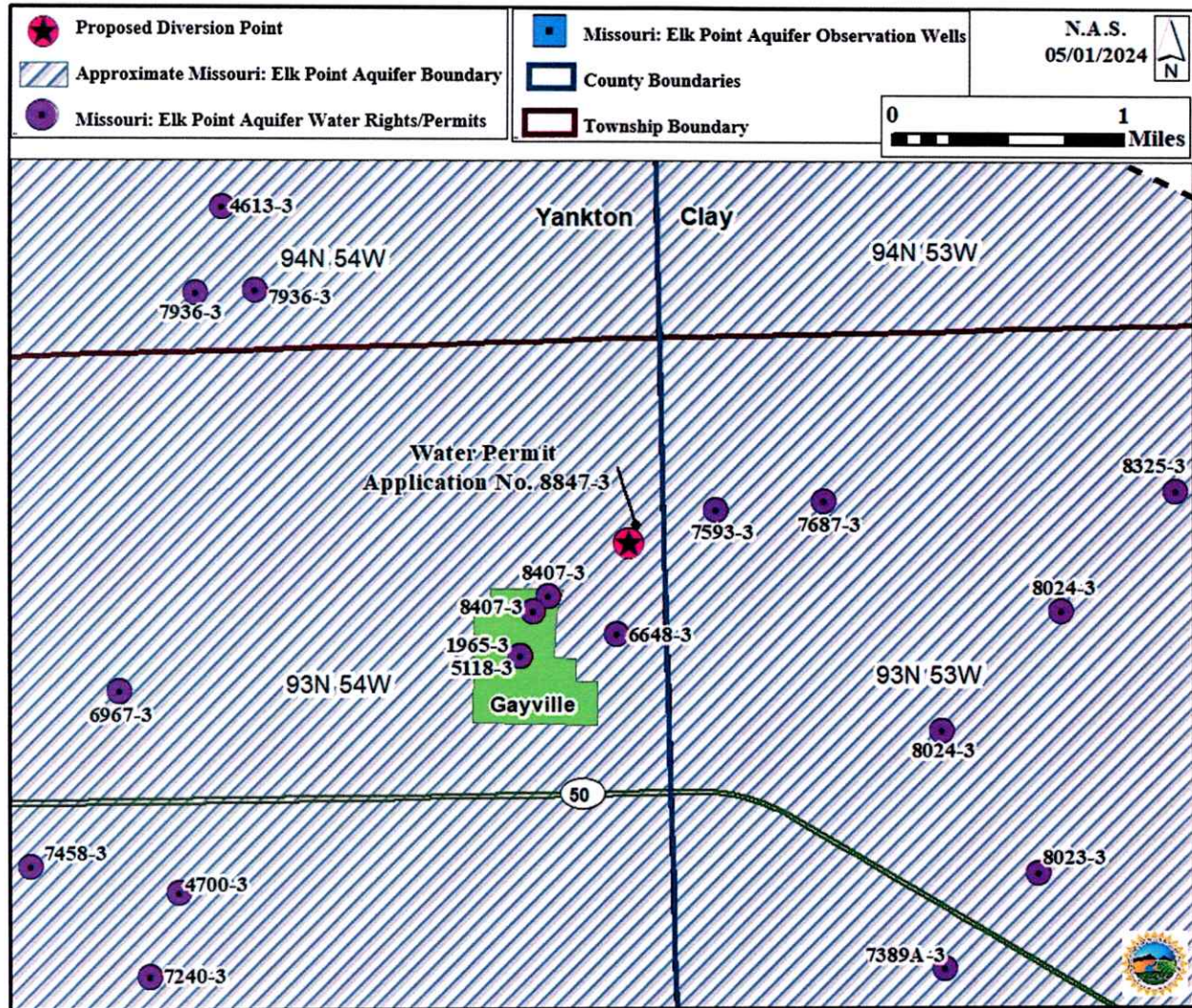


Figure 6. Location of the proposed diversion point for Water Permit Application No. 8847-3 and the Missouri: Elk Point aquifer water rights/permits and observation wells within approximately two miles (Water Rights, 2024b and 2024c)

The Missouri: Elk Point aquifer ranges from confined to unconfined aquifer conditions, but is primarily under unconfined conditions (Niehus, 1994 and 1997). Based on the well and test hole completion reports on file, the Missouri: Elk Point aquifer is expected to be confined near the proposed diversion point (Water Rights, 2024d). Drawdown created by pumping a well generally does not extend far from the pumped well in an unconfined aquifer; however, in a confined aquifer, drawdown from pumping could extend a distance from the diversion point. The exact drawdown behavior of a well cannot be known without an aquifer performance test. However, observation wells completed into the Missouri: Elk Point aquifer near permitted/licensed diversion points can provide some insight on how the aquifer responds to pumping.

Observation well YA-78J (approximately 3.9 miles west of the proposed diversion point) has four high-yield wells (assumed to be a well with an authorized diversion rate greater than 0.2 cfs) within approximately one mile of it (Water Rights, 2024b and 2024c). The lithologic log on file

for YA-78J noted the well was drilled 95 feet deep below the ground surface, had a casing stick up height of approximately 2.3 feet, and the top of aquifer materials approximately 55 feet below the ground surface (SDGS, 2024). The lowest recorded static water level on the hydrograph (displayed in Figure 2) is approximately 19 feet below the top of the well casing, which indicates there was still approximately 36 feet of artesian head pressure in YA-78J even during drier periods when high-yield wells are expected to be pumping more water and when water levels are generally naturally lower in response to drier conditions (SDGS, 2024; Water Rights, 2024b).

Within approximately one mile of the proposed diversion point, the Missouri: Elk Point aquifer has a saturated aquifer thickness of approximately 20 to 40 feet (Water Rights, 2024d). This would generally allow for enough thickness for a pump to be placed 20 feet below the top of the aquifer, which is required for the well to be considered adequate under ARSD 74:02:04:20(6). Any drawdown as a result of the proposed diversion for this application is not expected to unlawfully impair nearby adequate wells. In Clay, Union, and Yankton Counties, there are no substantiated complaints on file with the DANR-Water Rights Program regarding well interference for adequate wells completed into the Missouri: Elk Point aquifer (Water Rights, 2024e).

The Water Management Board recognizes that putting water to beneficial use requires a certain amount of drawdown to occur. The Board has developed rules to allow water to be placed to maximum beneficial use without the necessity of maintaining artesian head pressure for domestic use. The Water Management Board 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.”

The Water Management Board considered the delivery of water by artesian head pressure versus maximum beneficial use during the issuance of Water Right No. 2313-2 for Coca-Cola Bottling Company of the Black Hills. The Board adopted the Findings of Facts and Conclusions of Law that noted the reservation of artesian head pressure for delivery of water would be inconsistent with SDCL 46-1-4 which states, “general welfare requires that the water resources of the state be put to beneficial use to the fullest extent of which they are capable...” (Water Rights, 1995). Furthermore, the Water Management Board found if increased cost or decreased production as a result of impacts on artesian head pressure by legitimate users is to be considered as an unlawful impairment, it would also conflict with SDCL 46-1-4 (Water Rights, 1995). With that in mind, some existing well owners may need to install or lower pumps depending on the specific characteristics of the Missouri: Elk Point aquifer at their location. However, when considering the statutes (SDCL 46-1-4 and 46-6-6.1), rules (ARSD 74:02:04:20(6) and (7)), the saturated thickness of the Missouri: Elk Point aquifer near the proposed diversion point, and the lack of well interference complaints from the Missouri: Elk Point aquifer in the area, any drawdown created from the proposed diversion is not expected to cause an unlawful impairment on existing

water right/permit holders or domestic users with adequate wells. Therefore, there is a reasonable probability that any interference from the proposed appropriation will not impose unlawful impairments on existing users with adequate wells.

SDCL 46-5-6:

Pursuant to SDCL 46-5-6, the diversion rate for an irrigation appropriation cannot be in excess of 1.0 cfs per 70 acres, or “the equivalent thereof.” The statute does provide that: “The Water Management Board may allow a greater diversion, in volume or rate or both, if the method of irrigation, any time constraints on diversion of water, or the type of soil so requires...”

If approved, Water Permit Application No. 8847-3 would authorize a maximum instantaneous diversion rate of 1.11 cfs from one well for the irrigation of 65 acres, or at a rate of 1.2 cfs per 70 acres. The applicant did not provide a reason for the exceedance, but it appears to be due to the potential of irrigating the proposed area with a center pivot that does not make a full rotation due to a farmstead. A center pivot making a partial rotation uses water at the same rate as a center pivot making a full rotation while irrigating less acres. This reason falls within SDCL 46-5-6 which allows the Water Management Board to allow a greater diversion rate and has been accepted by the Water Management Board and the Water Rights Program in the past.

CONCLUSIONS:

1. Water Permit Application No. 8847-3 proposes to divert water at a maximum instantaneous diversion rate of 1.11 cfs from one well to be completed into the Missouri: Elk Point aquifer (approximately 100 feet deep) for the irrigation of 65 acres. The site of interest is located in Yankton County approximately one-half mile northeast of Gayville, SD.
2. Based on observation well data and the hydrologic budget, there is a reasonable probability that unappropriated water is available from the Missouri: Elk Point aquifer to supply the proposed appropriation.
3. There is a reasonable probability that the proposed diversion by Water Permit Application No. 8847-3 will not unlawfully impair adequate wells for existing water rights/permits and domestic users.
4. The applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres likely due to the partial rotation of the center pivot. This reason falls within SDCL 46-5-6 which allows the Water Management Board to allow a greater diversion rate and has been accepted by the Water Management Board and the Water Rights Program in the past.

Nakaila Steen

Nakaila Steen
Natural Resources Engineer II
SD DANR - Water Rights Program

Reviewed by:

Adam Mathiowetz

Adam Mathiowetz, PE
Natural Resources Engineer IV
SD DANR - Water Rights Program

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**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

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

June 6, 2024

Troy Cook
30983 452nd Avenue
Gayville SD 57031

Dear Mr. Cook:

Water Permit Application No. 8847-3 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 Daily Press & Dakotang printed in Yankton SD (Ph # 605 665-7811). 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,

Rachel Rodriguez

Rachel Rodriguez
Water Rights Program
(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.

NOTICE OF APPLICATION NO. 8847-3 to Appropriate Water

Notice is given that Troy Cook, 30983 452nd Avenue, Gayville SD 57031 has filed an application for a water permit to appropriate 1.11 cubic feet of water per second (cfs) from one well to be completed into the Missouri: Elk Point Aquifer (approximately 100 feet deep) located in the SE 1/4 SE 1/4 Section 1 for irrigation of 65 acres located in the E 1/2 SE 1/4 Section 1; all in T93N-R54W. The applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres. This site is located approximately one-half mile northeast of Gayville SD.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 8847-3 with qualifications because 1) unappropriated water is available, 2) existing domestic water uses and water rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest as it pertains to matters within the regulatory authority of the Water Management Board. The Chief Engineer's recommendation with qualifications, the application, and staff report are available at <https://danr.sd.gov/public> or contact Ron Duvall for this information, or other information, at the Water Rights Program address provided below.

Any person interested in opposing this application or recommendation shall allege that the application, upon approval, will cause injury to the person that is unique from any injury suffered by the public in general. The injury must concern a matter either within the regulatory authority found in SDCL 46-2A-9 for approval or denial of the application, or other matter concerning the application within the regulatory authority of the board to act upon as defined by SDCL 46-2-9 and 46-2-11, or both. Any person meeting the petitioner requirements and wishing to be a party of record in a contested case hearing shall file a written petition to oppose the application with BOTH the applicant and Chief Engineer. A petition opposing the application shall be filed on a form provided by the Chief Engineer. The petition form is available online at <https://danr.sd.gov/public> or by contacting the Chief Engineer. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501" or call (605) 773-3352. The applicant's mailing address is given above. If contesting the Chief Engineer's recommendation, the applicant shall also file a petition. A petition filed by either an interested person or the applicant must be filed by June 25, 2024.

The petition shall include a statement describing the unique injury upon approval of the application on the petitioner, the petitioner's reasons for opposing the application, and the name and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

Any interested person may file a comment on the application with the Chief Engineer. The comment shall be filed on a form provided by the Chief Engineer and is available online at <https://danr.sd.gov/public> or by calling (605) 773-3352 or writing the Chief Engineer at the address provided above. Filing a comment does not make the commenter a party of record or a participant in any hearing that may be held. Any comment must be filed by June 25, 2024.

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.

Published once at the total approximate cost of _

Rodriguez, Rachel

From: Rodriguez, Rachel
Sent: Wednesday, June 5, 2024 1:51 PM
To: Kelly Kronaizl
Subject: 8847-3 Troy Cook - Public Notice
Attachments: 8847-3 public.short_final.docx; FORM8.FRM.doc

Attached is a notice to be published on June 14, 2024, in the Daily Press & Dakotan.

Troy Cook, 30983 452nd Avenue, Gayville SD 57031, 605-659-0611, 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 Ave, Pierre SD 57501.

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

Thank you,

Rachel Rodriguez
DANR | Program Assistant
Rachel.Rodriguez@state.sd.us



AFFIDAVIT OF PUBLICATION

YANKTON DAILY PRESS AND DAKOTAN

TROY COOK
30983 452ND AVE
GAYVILLE SD 57031

STATE OF SOUTH DAKOTA
COUNTY OF YANKTON

KELLY HERTZ, BEING FIRST DULY SWORN ON OATH DEPOSES
AND SAYS THAT (S)HE IS THE MANAGING EDITOR OF YANKTON
MEDIA INC, A CORPORATION, THE PRINTER AND THE PUBLISHER OF THE
YANKTON DAILY PRESS AND DAKOTAN, A LEGAL DAILY NEWSPAPER
PUBLISHED AND CIRCULATED IN THE CITY OF YANKTON, SAID COUNTY
AND STATE, AND ONE OF THE OFFICIAL NEWSPAPERS OF THE SAID
COUNTY OF FACTS STATED IN THIS AFFIDAVIT; THAT THE ANNEXED
NOTICE OF APPLICATION NO.

TAKEN FROM THE PAPER, IN WHICH IT WAS LAST PUBLISHED IN THE
NEWSPAPER ON THE 14th DAY OF June, 2024
THAT THE FULL AMOUNT OF THE FEE CHARGED FOR THE PUBLICATION
OF SAID NOTICE TO WIT \$40.64 ENSURES TO THE
BENEFITS OF THE PUBLISHER OF SAID NEWSPAPER AND THAT NO
AGREEMENT AND 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.

PUBLISHED ON: 06/14/2024

FILED ON: 06/12/24


SUBSCRIBED AND SWORN TO BEFORE ME THIS 12th DAY OF June, 2024


NOTARY PUBLIC, SOUTH DAKOTA
MY COMMISSION EXPIRES 12/15/2029



RECEIVED

JUN 17 2024

OFFICE OF
WATER

Ad text :

NOTICE OF APPLICATION NO. 8847-3 to Appropriate Water

Notice is given that Troy Cook, 30983 452nd Avenue, Gayville SD 57031 has filed an application for a water permit to appropriate 1.11 cubic feet of water per second (cfs) from one well to be completed into the Missouri: Elk Point Aquifer (approximately 100 feet deep) located in the SE 1/4 SE 1/4 Section 1 for irrigation of 65 acres located in the E 1/2 SE 1/4 Section 1; all in T93N-R54W. The applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres. This site is located approximately one-half mile northeast of Gayville SD.

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Published once at the total approximate cost of \$40.64 and can be viewed free of charge at www.sdpublicnotices.com

Published June 14, 2024.



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and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

JUL 25 2024

Troy Cook
30983 452nd Avenue
Gayville SD 57031

Dear Mr. Cook:

Enclosed is Water Permit No. 8847-3 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,

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

enclosures



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

**Affidavit of Public Notice
Posting on DANR Website**

Pursuant to SDCL § 46-2A-4, public notice of the following application was posted on the DANR web site at <https://danr.sd.gov/public>. The posted public notice is the same notice as published in the pertinent newspaper(s) and a copy of the public notice is maintained in the application file. If the application is contested, the posting is moved to the DANR contested case website at <https://danr.sd.gov/public/ContestedCase.aspx> until final action is taken on the application pursuant to SDCL § 46-2A-4.

Application No.: 8847-3

Name of Applicant: Troy Cook

Date of Posting: 6/10/2024

Date of Removal: 7/25/2024



Ron Duvall, Engineer III

7/25/2024

Date

Subscribed and sworn to before me, a notary public, this 25th day of July, 2024.



Notary Public - South Dakota
My commission expires:

(SEAL)

Rachel Rodriguez
My Commission Expires
May 16, 2029

