

WATER PERMIT NO. 8327-3

Name of Applicant: Gary Hokana, Davy Hokana, Deb Honeyman, Cindy Reyes, Sandy Bobzien

Address: 9975 96th Ave SD, Ellendale ND 58436 Phone: 701 710 0359

Amount of Water Claimed: 1.78 cf Total Acres: 116.52 acres

Source of Water Supply: 3 wells and a dugout

Water to be used for: irrigation County: Brown

Type of Waste Disposal System:

Location: approximately 8 miles northeast of Frederick

PRIORITY Date Received: 1-26-18 Application/License Fee: \$ 950

Corrected Application Received: Period of Annual Use: April 1 – October 31

Remarks:

Diversion Point: wells – SE 1/4 SE 1/4 Sec 10
dugout – NW 1/4 SE 1/4 Sec 10; all in T128N-
R63W

Land to be Irrigated: SE 1/4 Sec 10-T128N-R63W

Depth of Well: 125 feet deep

Well Driller:

Remarks:

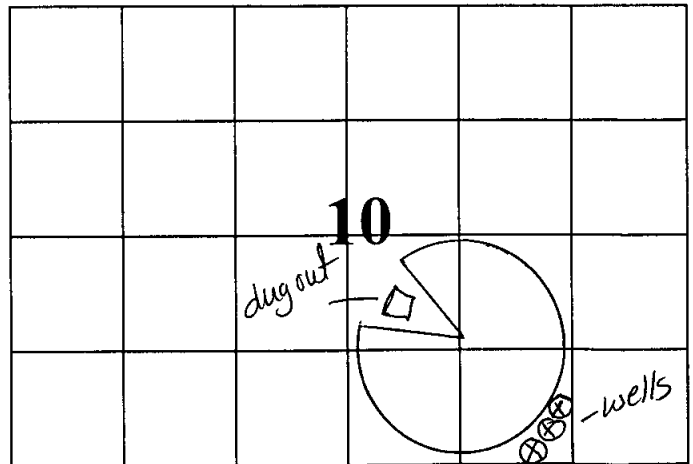
Type of Map: aerial

Prepared by:

Reviewed and the Number Assigned on: 1-26-18

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____



**SOUTH DAKOTA
WATER PERMIT NO. 8327-3**

Date of first receipt of application January 26, 2018.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 8327-3 to Gary Hokana, Davy Hokana, Deb Honeyman, Cindy Reyes and Sandy Bobzien, c/o Trevor Hokana Operator, 9975 96th Ave SE, Ellendale ND 58436 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. 8327-3 appropriates 1.78 cubic feet of water per second (cfs) from a dugout located in the NW 1/4 SE 1/4 Section 10 and three wells to be completed into the Elm Northern Brown Aquifer (125 feet deep) located in the SE 1/4 SE 1/4 Section 10 for irrigation of 116.52 acres located in the SE 1/4 Section 10; all in T128N-R63W which is approximately 8 miles northeast of Frederick 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: April 1 – October 31.
3. The date from which applicant may claim right is January 26, 2018.
4. The date of approval of Permit No. 8327-3 is April 16, 2018.
5. One-fifth of the construction is to be completed on or before October 16, 2020.
6. All construction is to be completed on or before April 16, 2023.
7. Water is to be put to beneficial use on or before April 16, 2027.
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 wells approved under Permit No. 8327-3 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 wells authorized by Permit No. 8327-3 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. 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. 8327-3 authorizes a maximum diversion rate of 1.78 cfs for the irrigation of 116.52 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: _____

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

APR 19 2018

date



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JAN 26 2018

WATER RIGHTS
PROGRAM

Mail to: DENR - Water Rights 523 E Capitol Ave Pierre, SD 57501-3182 ph: (605) 773-3352	No. <u>8327-3</u>	(office use only) Hydrologic Unit <u>10160003</u>
	Basin <u>James River</u>	
	Newspaper <u>American News, Aberdeen</u>	

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 Gary Hokana, Daisy Hokana, Deb Honeyman, Lirly Ruyss
Note: The "Name to Appear on Irrigation Permit" must be the name in which the property to be irrigated is held in. Sandy Robinson

Mailing Address 9975 96th AVE SE ELLIENHLE ND 58436
(Address) (City) (State) (Zip Code)

Phone 701-783-4403 Mobile 701-710-0359 Email GLHokana@PRTEL.net

2. Amount of water claimed 1.78 *CFS or 700-800 **GPM 174.78 ***AF Total Acreage 116.52
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)

3. Source of water supply New Wells + Possible Dugout

4. Location of point of diversion 3 Wells in SE 1/4 Section 10-T128N-R63W + Dugout
(example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)
3rd SE 1/4 of SE 1/4 10-T128N-R63W See Map County Brown

5. County or counties where water will be used Brown

6. Annual period during which water is to be used ~~April - October~~ April - October

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>SE 10-128-63 3/4 Circle</u>	<u>116.52</u>		

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

SEE Attachment - Requesting diversion rate greater than statutory limit

I, Trevor Hokana Operator, 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)

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JAN 26 2018

WATER RIGHTS
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1. Well Information

(check one or both as applicable)



Drilling new well(s)



Using existing well(s)

a) If new wells, how many ~3 Have test holes been drilled ☐ Yes ☒ No Drilled by _____
(if yes, please provide copies of logs)

b) If existing wells, how many 0 Provide copy of log(s), if available. Drilled by REF BN 98B

For either Existing or Proposed Wells:

c) Well Depth (required) 125 Depth to Top of Water Bearing Material _____ Depth to Water from Surface 20 ft

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

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 ~370 x ~350 Depth ~14 ft

b) Depth to water (ground surface to water level) ~2 ft

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)

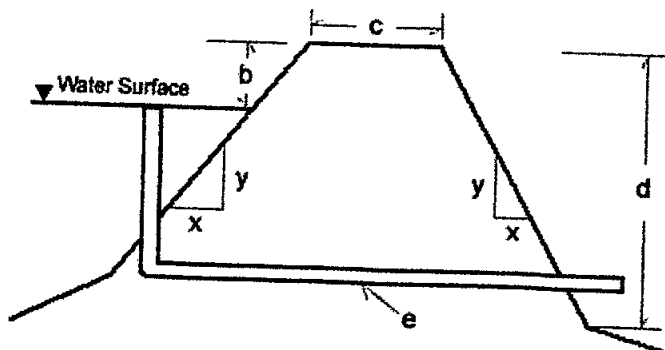
Upstream _____

Downstream _____

h) Surface Area of Impoundment _____

i) Storage _____ Acre Feet

j) Drainage Area Above Dam _____ Acres



SE ¼ sec 10-128-63 landowners and address

Gary Hokana 9975 96th ave se Ellendale ND 58436

Davy Hokana 9975 96th ave se Ellendale ND 58436

Deb Honeyman 668 cottonwood loop Bismarck ND 58504

Cindy Reyes 1656 Honeywood Ct Brea CA 92821-2736

Sandy Bobzien 1719 N. Jay St. Aberdeen 57401

Contact Trevor Hokana (operator)

701-710-0707

9975 96th AVE SE ELLENDALE ND 58436

trevor.hokana@hotmail.com



Hoffman Irrigation Inc.

SE 1/4 Sec 10 T128N-R63W
SAVO Twn. Brown County, SD

Grower: ~~Trewer~~ Trewer Hokana

Date: 01/23/2018

Farm: SE 10-128-63 3/4 Circle

Field Name: SE 10-128-63 3/4 Circle

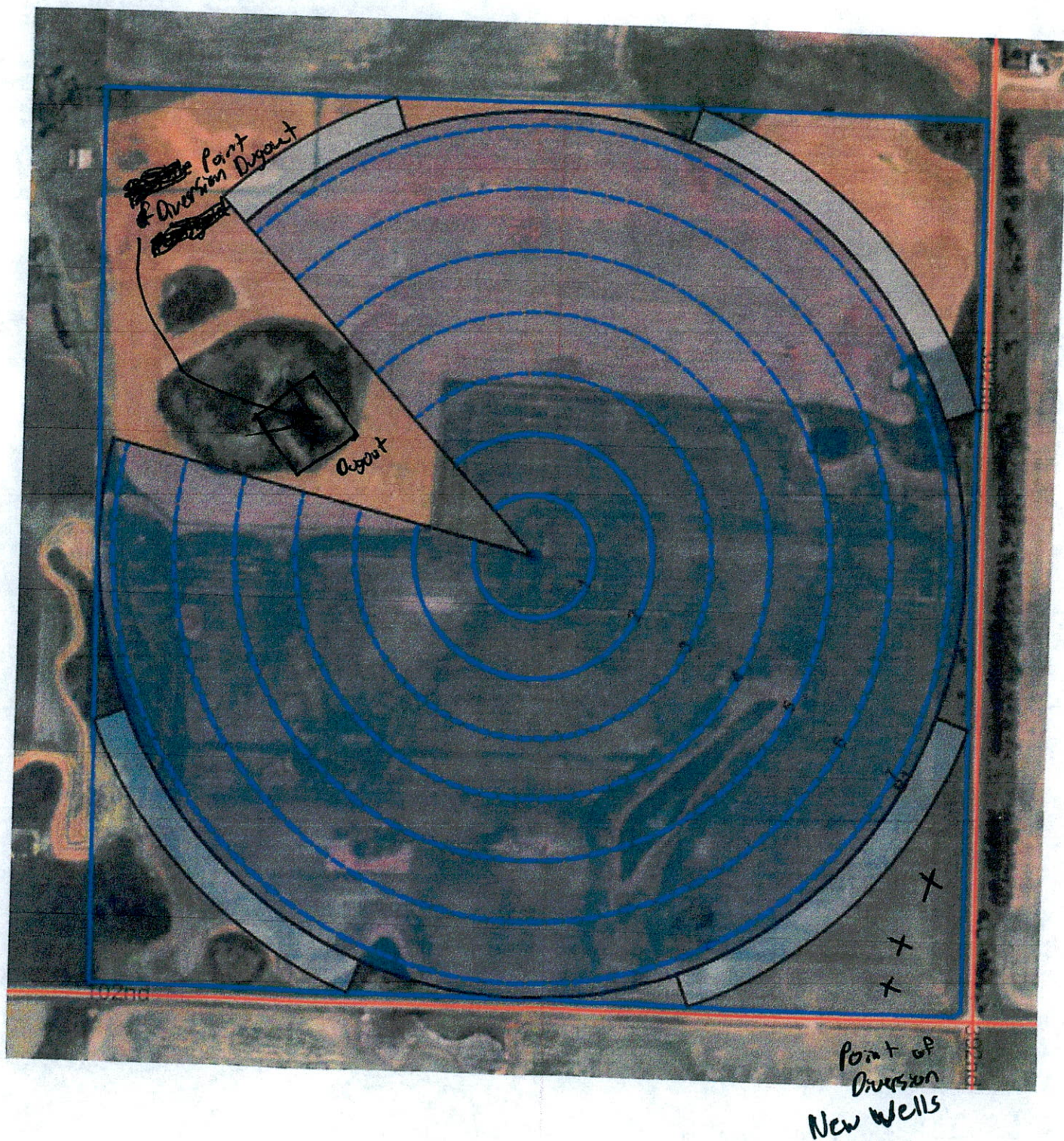
Field Area: 153.86 acres

System Model: E2065

System Length: 1,281.00 ft

Total Irr. Area: 116.52 acres

Number of Spans: 7

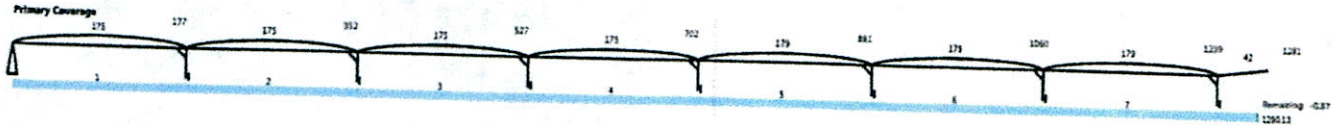


System Length 1,281.00 Total Spans: 7
Pivot Center Lat/Long: 45 54' 42.89"N / 98 23' 56.25" W

1st/2nd Endgun Throw: 100
Degree of Sweep: 326.67

Total Irrigated Acres: 116.52 Pivot Acres: 107.39
SAC/SSAC Acres: Wrap Span Acres:

1st/2nd Endgun Areas: 9.13
Drop Span Acres:



Span Information							
Span No.	1	2	3	4	5	6	7
Model:	E2065	E2065	E2065	E2065	E2065	E2065	E2065
Length:	175'	175'	175'	175'	179'	179'	179'
Dist - Twr.	177.00 ft'	352.00 ft'	527.00 ft'	702.00 ft'	881.00 ft'	1,060.00 ft'	1,239.00 ft'
Pipe Size:	6_5/8	6_5/8	6_5/8	6_5/8	6_5/8	6_5/8	6_5/8
Outlet Sp:	57"	57"	57"	57"	57"	57"	57"
							End Boom
							42'

Primary (1st) Endgun Areas by Location						
SR100NV (feet)	Degree from North		Degree from Pivot Start		Latitude / Longitude in Degrees	
	Start	Stop	Start	Stop	Start	Stop
Area 1	19.4	70.4	62.6	113.6	45 54' 55.72"N 98 23' 49.63" W	45 54' 47.37"N 98 23' 37.80" W
Area 2	109.3	158.8	152.6	202.1	45 54' 38.27"N 98 23' 37.86" W	45 54' 30.13"N 98 23' 49.34" W
Area 3	201.7	247.9	245.0	291.2	45 54' 30.26"N 98 24' 3.63" W	45 54' 37.86"N 98 24' 14.41" W
Area 4	316.7	341.2	360.0	24.5	45 54' 52.89"N 98 24' 9.54" W	45 54' 55.83"N 98 24' 2.40" W
						1.31 acres

System

116.52 Acres

174.78 Acre Ft.

700 - 800 GPM



RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date January 26, 20 18

RECEIVED OF Trevor Hekan 9975 96th Ave SE Ellendale, ND 58436-9666

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

Fee for Application for Permit No. <u>8327-3</u> to Appropriate Water, to construct and to put water to beneficial use	750	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>8327-3</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	950 00

No. **08539**

By

Jeanne Goodman
Chief Engineer

vm

Schlaak, Karen

From: Schlaak, Karen
Sent: Thursday, March 29, 2018 1:19 PM
To: Nancy Zantow (nzantow@aberdeennews.com)
Subject: Application No. 8327-3
Attachments: 8327-3public.short.docx; FORM8.FRM.doc

Attached is a notice to be published on April 5, 2018.

Trevor Hokana, 9975 96th Ave SE, Ellendale ND 58436 (701 710-0707) has been notified to contact you to authorize publication and arrange for payment.

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

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

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



Schlaak, Karen

From: Schlaak, Karen
Sent: Thursday, March 29, 2018 1:13 PM
To: 'trevor.hokana@hotmail.com'
Subject: Water Permit Application
Attachments: 8327-3.pdf

Trevor,

Attached is a copy of the Chief Engineer recommendation and report on your Water Permit Application No. 8327-3. Also included are instructions regarding the public notice. The notice has been emailed to the paper. Please contact the American News to authorize publication and arrange for payment ASAP. Paper copy is in the mail today.

Karen Schlaak

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





DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

denr.sd.gov

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

March 29, 2018

Trevor Hokana, Operator
9975 96th Ave SE
Ellendale ND 58436

Dear Mr. Hokana:

Water Permit Application No. 8327-3 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 Aberdeen American News (Ph # 605-605 225-4100). You will need to contact the newspaper and authorize publication of this notice. For your information, a copy of the notice, the recommendation of the Chief Engineer and report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

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

Sincerely,

Eric Gronlund
Natural Resources Engineer
(605) 773-3352

enclosures

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

NOTICE OF APPLICATION NO. 8327-3 to Appropriate Water

Notice is given that Gary Hokana, Davy Hokana, Deb Honeyman, Cindy Reyes and Sandy Bobzien, c/o Trevor Hokana, Operator, 9975 96th Ave SE, Ellendale ND 58436 have filed an application for a water permit to appropriate 1.78 cubic feet of water per second (cfs) from a dugout located in the NW 1/4 SE 1/4 Section 10 and three wells to be completed into the Elm Northern Brown Aquifer (125 feet deep) located in the SE 1/4 SE 1/4 Section 10 for irrigation of 116.52 acres located in the SE 1/4 Section 10; all in T128N-R63W which is approximately 8 miles northeast of Frederick SD. The applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 8327-3 with qualifications because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. The Chief Engineer's recommendation with qualifications, the application, and staff report are available at <http://denr.sd.gov/public> or contact Eric Gronlund for this information, or other information, at the Water Rights Program address provided below.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by April 16, 2018.

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

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

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

Form 8

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)

County of Brown) SS

I, Mary Bastian

certify that the attached printed Notice was taken

from the Aberdeen News

printed and published in Aberdeen

County of Brown and

state of South Dakota. The notice was published

in the newspaper on the following date:

April 5 2018

Cost of Printing \$ 52.44

Mary Bastian
(Signature)

Advertising Billing Sec
(Title)

April 5, 2018
(Date Signed)

(No. 448165)
(April 5, 2018 - 1T)

NOTICE OF APPLICATION NO: 8327-3 to Appropriate Water

Notice is given that Gary Hokana, Davy Hokana, Deb Honeyman, Cindy Reyes and Sandy Bobzien, c/o Trevor Hokana, Operator, 9975 86th Ave SE, Ellendale ND 58436 have filed an application for a water permit to appropriate 1.78 cubic feet of water per second (cfs) from a dugout located in the NW 1/4 SE 1/4 Section 10 and three wells to be completed into the Elm Northern Brown Aquifer (125 feet deep) located in the SE 1/4 SE 1/4 Section 10 for irrigation of 116.52 acres located in the SE 1/4 Section 10; all in T128N-R63W which is approximately 8 miles northeast of Frederick SD. The applicant is requesting a diversion rate greater than the statutory limit of 1 cfs per 70 acres.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 8327-3 with qualifications because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. The Chief Engineer's recommendation with qualifications, the application, and staff report are available at <http://denr.sd.gov/public>

or contact Eric Gronlund for this information, or other information, at the Water Rights Program address provided below.

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

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

Steven M. Pirner, Secretary, Department of Environment and Natural Resources. Published once at the total approximate cost of \$52.44.

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**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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<http://denr.sd.gov>

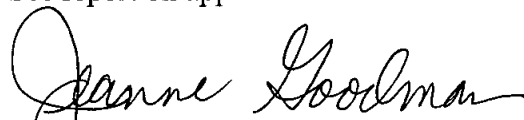
**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 8327-3,
Gary Hokana, Davy Hokana, Deb Honeyman, Cindy Reyes and Sandy Bobzien**

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. 8327-3, Gary Hokana, Davy Hokana, Deb Honeyman, Cindy Reyes and Sandy Bobzien, care of Trevor Hokana, Operator, 9975 96th Avenue SE Ellendale ND 58436.

The Chief Engineer is recommending APPROVAL of Application No. 8327-3 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 wells approved under Permit No. 8327-3 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 wells authorized by Permit No. 8327-3 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. 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. 8327-3 authorizes a maximum diversion rate of 1.78 cfs for the irrigation of 116.52 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.


Jeanne Goodman, Chief Engineer
March 29, 2018

NOTE: Dugouts are not considered adequate wells and therefore would not be afforded protection under water rights law should fluctuation in the water levels occur.

REPORT TO THE CHIEF ENGINEER

Water Permit Application No. 8327-3

Gary Hokana, Davy Hokana, Deb Honeyman, Cindy Reyes, and Sandy Bobzein

C/O Trevor Hokana, Operator

March 26, 2018

Water Permit Application No. 8327-3 proposes to appropriate water for irrigation of 116.52 acres located in the SE ¼ Section 10 T128N-R63W at a maximum diversion rate of 1.78 cubic feet per second (cfs). These acres will be supplied using water from three new wells (approximately 125 feet deep) located in the SE ¼ SE ¼ Section 10, and a dugout located in the NW ¼ SE ¼ Section 10; all in T128N-R63W. This application is located in Brown County, approximately 7.5 miles northeast of Frederick, SD and 11.5 miles west of Hecla, SD. The applicant is requesting a diversion rate greater than the statutory limit.

AQUIFER: Elm: Northern Brown (E:NB)

HYDROGEOLOGY

In Brown County, the Elm aquifer is the uppermost sand and gravel glacial outwash aquifer in the Elm, Middle James and Deep James aquifer system (Emmons, 1990). The Elm aquifer is further divided into the Northern Brown and Southern Brown management units (Hedges et al., 1982) presumably due to a change in the width of the aquifer near Aberdeen, SD. These aquifers are all located in glacial deposits, with glacial outwash deposits forming the water bearing units and glacial till deposits forming the confining units. Differences between the three aquifers can be difficult to easily identify, aside from their stratigraphic position. Where present, Koch and Bradford (1976) identified the Deep James as occurring at an elevation between 975 and 1,175 feet above sea level, the Middle James between 1,150 and 1,250 feet above sea level, and the Elm occurring between 1,225 and 1,400 feet above sea level. At the estimated depth and location of the proposed wells and dugout, this application is seeking water from the Northern Brown management unit of the Elm aquifer.

The applicant's location is approximately two miles from North Dakota. In North Dakota, the glacial outwash deposit that occurs at a similar elevation to the Elm: Northern Brown aquifer correlates with both the Ellendale and the Guelph aquifers. The distinguishing feature between the Guelph and the Ellendale aquifers is that the Guelph is identified as being under a topographic feature (Parkin, 2018), a long narrow ridge called Cannon Hill. Cannon Hill is theorized to have been formed by an esker or river deposit that was then overlain with till from a readvancement of the glacier (Bluemle, 1979). Following this ridge into South Dakota, it passes less than a mile to the west of the applicant's location, and it appears that observation wells BN-98B and BN-98A are both completed into the gravel deposit that is equivalent to the Guelph aquifer. Two wells drilled less than a quarter mile east of the applicant's location did not encounter gravel deposits, and encountered sand intervals at different elevations, an indication of the variable nature of a glacial outwash deposit. No test holes have been drilled at the applicant's location.

The outwash that makes up the Elm aquifer can be up to 113 feet in thickness, with an average thickness of 32 feet and can be found in either unconfined or confined conditions (Emmons,

1990). Water levels range from 4 to 50 feet below the land surface (Koch and Bradford, 1976). The outwash may contain thin layers of till or clayey and silty outwash layers that may inhibit flow within the deposit. Hedges et al. (1982) estimated the Elm: Northern Brown as encompassing 187,200 acres in Brown County, and containing an estimated 702,000 acre-ft of recoverable water in storage. The movement of groundwater within the aquifer is generally from the northwest to the southeast (Koch and Bradford, 1976; Water Rights, 2018c). At the applicant's location, the Elm: Northern Brown aquifer is expected to be under confined conditions.

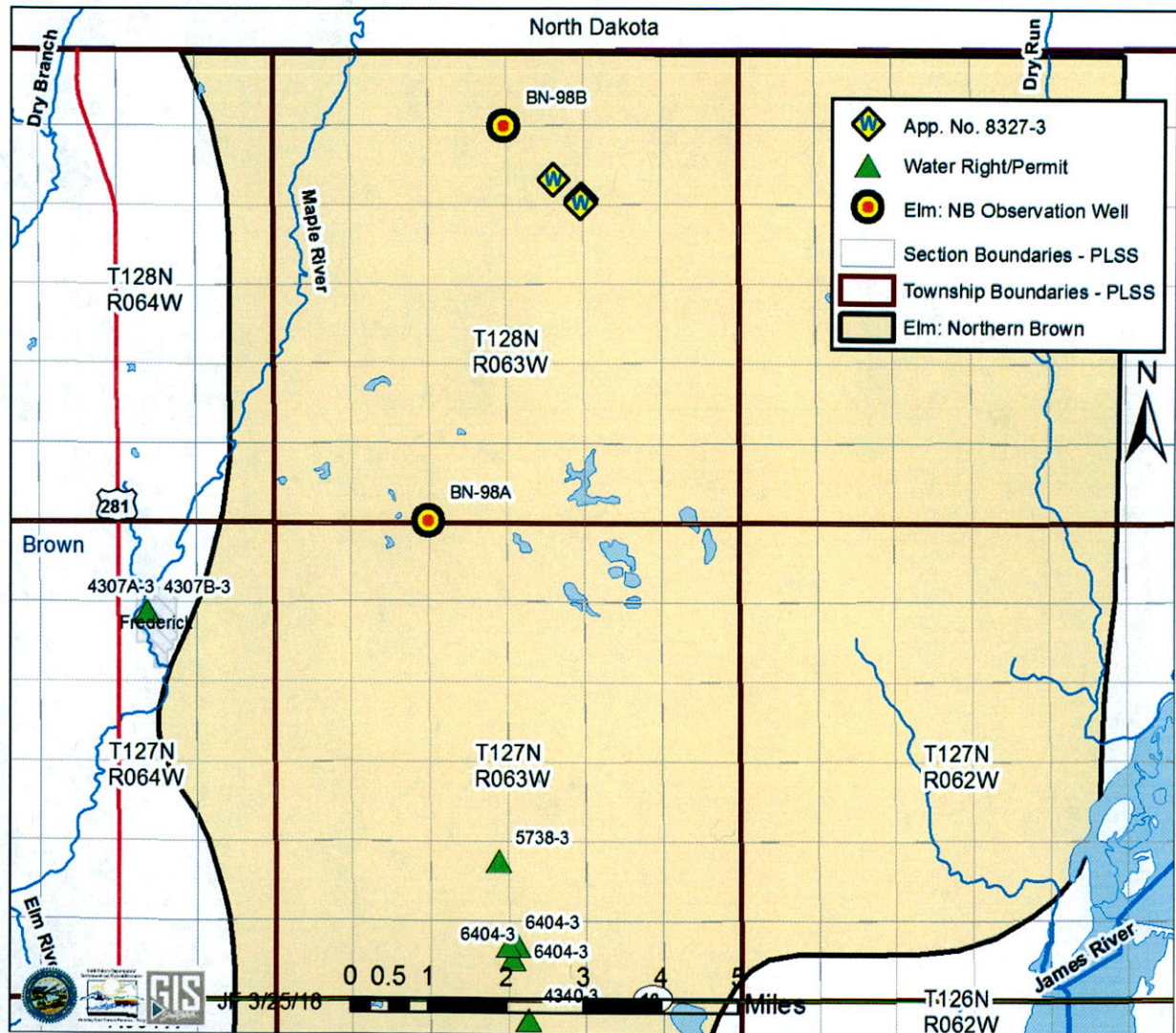


Figure 1. Map showing the location of the proposed diversions, observation wells, nearby water rights/permits and a portion of the Elm: Northern Brown aquifer as modified from Koch and Bradford (1976) (Water Rights, 2018a; Water Rights, 2018c).

South Dakota Codified Law 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 proposed diversion can be developed without unlawful impairment of existing rights and that the proposed use is a beneficial use and in the public interest. This report will address the availability of unappropriated water and existing rights within the Elm: Northern Brown aquifer.

WATER AVAILABILITY

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 than or stratigraphically lower than the Greenhorn Formation and a water distribution system has applied for a permit, the Board need not take into consideration the balance of aquifer recharge and withdrawal. Here, the water source is not older or lower than the Greenhorn Formation and a water distribution system is not involved. Therefore, the balance of withdrawal and recharge must be considered.

Hydrologic Budget

Recharge

Recharge to the Elm: Northern Brown aquifer occurs through infiltration of precipitation and snowmelt, and possibly by leakage from surface water (Emmons, 1990; Koch and Bradford, 1976). Recharge occurs more slowly where the aquifer is overlaid by less permeable deposits of till or clayey and silty lake deposits (Emmons, 1990). It was estimated by Emmons (1987) that a confining bed thickness of 10 feet is probably sufficient to confine the aquifer. Emmons (1990) determined the thickness of the overlying confining bed to average 20 feet. Recharge occurs more rapidly in areas where the aquifer is at or near land surface, or where the aquifer is overlain by more permeable sandy lake deposits (Emmons, 1990).

From a flow-net analysis, Hedges et al. (1985) estimated the recharge rate to the Elm: Northern Brown aquifer to be 0.06 inches per year. The areal extent of the Elm: Northern Brown aquifer is 187,200 acres (Hedges et al, 1982), resulting in an estimated recharge to the aquifer of approximately 936 ac-ft/yr. It was noted in Hedges et al. (1985) that recharge rates calculated using flow-net analysis are suspect and that conclusions based upon this method are questionable. A flow-net analysis was also performed for the Elm: Southern Brown, and estimated the recharge to be 0.42 inches per year (Hedges et al., 1985).

A model was developed by Emmons (1990) for the entire glacial-aquifer system in the northern portions of Brown County. In the model, the Elm: Northern Brown and the sandy lake deposits were lumped together into a single layer, resulting in an average steady-state recharge of 4.3 inches per year. This number does not agree with the estimate produced by Hedges et al. (1985), due to the more permeable sandy lake deposits being included and their stratigraphic position being closer to the ground surface with less confining material overlying them (Emmons, 1990).

A more recent model was developed by Marini and others (2012) that looked at a portion of the glacial aquifer system in Brown County, north of Aberdeen. This model estimated the recharge to the aquifer using a soil-water-balance method and determined that from 1979-2009, the mean annual recharge rate was 1.56 inches per year, resulting in an estimated recharge to the aquifer of approximately 24,336 ac-ft/yr. This model also included the sandy lake deposits in with the Elm: Northern Brown aquifer due to the hydraulic connection between these units.

Discharge

Discharge from the Elm: Northern Brown aquifer occurs through well withdrawals, evapotranspiration from areas where the aquifer is near the land surface, seepage to gravel pits, and outflow to the sandy lake deposits, the Middle James aquifer, and seepage into the Elm River and Foot Creek (Emmons, 1990; Koch and Bradford, 1976).

Currently, there are 25 Water Rights/Permits appropriating water from the Elm: Northern Brown aquifer (Water Rights, 2018a). Eighteen of these water rights/permits are for irrigation use, one is for commercial use, and six are for municipal use. There are also two future use permits reserving 5,647 acre-ft of water for the City of Aberdeen. The amount of water that can be expected to be withdrawn can be estimated by assuming water rights/permits limited by an annual volume will pump the entire volume appropriated annually, water rights/permits limited only by diversion rate will pump at the maximum permitted diversion rate 60 percent of the time, and future use permits will eventually be fully developed. The commercial use permit is licensed for 0.36 cfs and is expected to use 156 acre-ft per year. The two water rights for the Town of Frederick are maintained for emergency use as the town is connected to the WEB Rural Water System, and on average, they are expected to use a negligible amount of groundwater from their wells. The four water rights for the City of Aberdeen total 7.22 cfs of pumping (with no annual quantity defined), and 3,657 acre-ft annually at a total maximum diversion rate of 6.24 cfs. Reported usage by the City of Aberdeen from 2005 to 2016 has averaged 923.25 acre-ft per year, with a minimum of 549 acre-ft and a maximum of 1,262 acre-ft. Assuming the City of Aberdeen usage remains similar, the estimated average annual use is 924 acre-ft per year.

There are a number of domestic wells on file that withdraw water from the Elm: Northern Brown aquifer, however the magnitude of their withdrawals is small, and since the introduction of rural water systems, many of these wells may no longer be in use (Water Rights, 2018b). The annual quantity of water withdrawn for domestic uses is considered to not be significant to the hydrologic budget of the aquifer.

Irrigation data from 2016 shows that there were 18 water rights/permits that were permitted for irrigation (Water Rights, 2018d). These water rights/permits appropriated 7,429.9 acre-ft of water in 2016, however the actual usage is much less. Figure 2 shows the acres permitted for irrigation from 1979 to 2016 and the yearly total reported pumpage for the irrigation permits.

The period from 1979 to 2016 was relatively steady in terms of permitted acres for irrigation, with one exception. The dramatic increase in permitted acres in the 1990's is due to a couple permits that were issued, however they were not constructed and subsequently canceled. The overall average of the permitted acres from 1979 to 2016 is 3,358.6 acres. Over this time period, the average reported irrigation pumpage is 1,086 acre-ft.

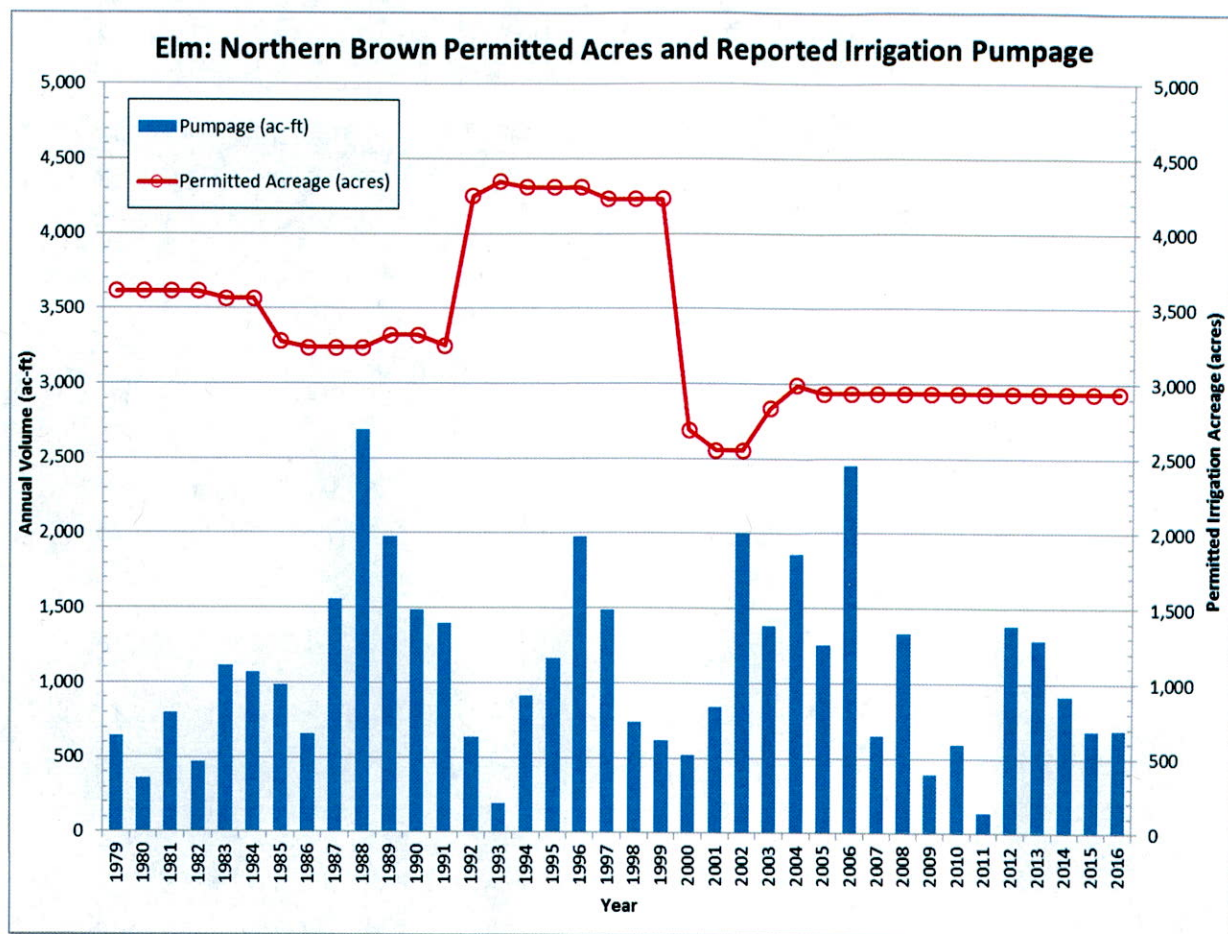


Figure 2: Acres permitted for irrigation and reported irrigation pumpage (Water Rights 2018a, Water Rights 2018d)

In 2016, there was a total of 2,937.3 acres permitted for irrigation. Between the 2016 irrigation season and March 2018, there have been no irrigation applications for the Elm: Northern Brown aquifer. The estimated annual usage from irrigation permits is the average reported irrigation pumpage from 1979-2016 is 1,086 acre-ft.

In South Dakota, on average, an irrigation system typically applies less than 12 inches of water onto the permitted acreage. If this application is approved, the irrigation of 116.52 acres would result in an estimated average annual use of less than 116.52 acre-ft.

Hydrologic Budget

The estimated withdrawals from the Elm: Northern Brown aquifer are 1,080 ac-ft/yr from non-irrigation users, and 1,086 ac-ft/yr from irrigation. Including an estimated 116.52 ac-ft/yr from this application, the estimated average annual withdrawal from the Elm: Northern Brown aquifer is 2,282.52 ac-ft/yr with future use permits reserving an additional 5,647 acre-ft of water.

In order to supply the estimated average annual withdrawal, a recharge rate of 0.14 inches per year is required. Including the future use permits, the required recharge rate increases to 0.51

inches per year. While the recharge rate of 0.06 inches per year is likely too low, the recharge rate of 4.3 inches per year is likely too high. Using an average recharge rate similar to Marini and others (2012) estimated mean recharge rate of 1.56 inches per year may be more appropriate. It is reasonable that the actual recharge rate lies somewhere between 0.06 and 4.3 inches per year. The estimated annual withdrawals including the future use reservations equate to roughly one percent of the available water in storage. Due to the relatively small development of this large resource, there is a reasonable probability there is unappropriated water available from the Elm: Northern Brown aquifer for the proposed appropriation.

Observation Well Data

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.

The Water Rights Program monitors 12 observation wells completed in the Elm: Northern Brown aquifer (Water Rights, 2018c). The nearest observation well is BN-98B, located approximately 1.3 miles northwest of the well location. BN-98B is currently identified as observing the Middle James: Columbia aquifer, however this is most likely erroneous given the location, depth of the well, and water level. For this report, BN-98B has been reclassified as an Elm: Northern Brown observation well. As shown in Figure 1, the location of the next nearest observation well, BN-98A, is approximately 4.5 miles southwest of the applicant's location. These two observation wells are representative of the Elm: Northern Brown aquifer by responding to the same hydrologic conditions in a similar manner. The hydrographs for these two observation wells are shown in Figures 3 and 4. The observation wells are both completed into a gravel deposit, and depending upon the continuity and hydraulic transmissivity of the deposit, the effects of drawdown could extend for some distance. BN-98B does show the seasonal effects of drawdown, presumably from irrigation pumping, the closest irrigation system to this observation well is located approximately 3.5 miles to the northeast, in North Dakota.

The hydrographs show that the aquifer responds well to hydrologic conditions, recharging during wetter periods and declining during drier periods. Both of these observation wells are under confined conditions. The observation well measurements show that the effects from pumping are temporal, and that the aquifer generally returns to pre-pumping conditions. The observation well data indicates that there is a reasonable probability that there is unappropriated water available from the Elm: Northern Brown aquifer.

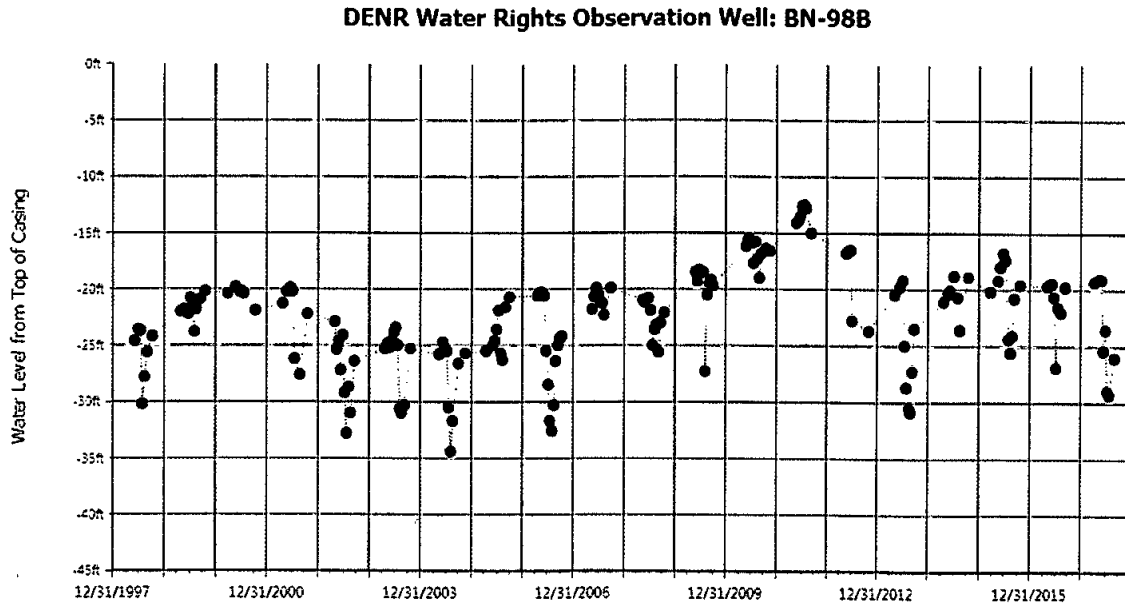


Figure 3: Hydrograph for Observation Well BN-98B (Water Rights, 2018c)

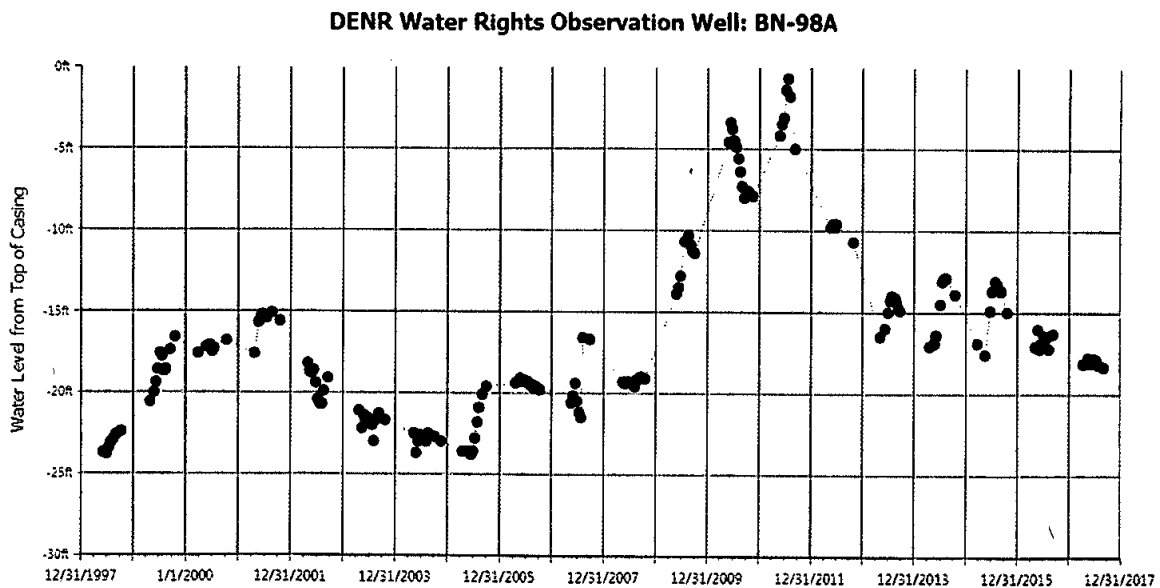


Figure 4: Hydrograph for Observation Well BN-98A (Water Rights, 2018c)

EXISTING WATER RIGHTS

There are 25 water rights/permits appropriating water and 2 future use permits reserving water from the Elm: Northern Brown aquifer (Water Rights, 2018a). The location of the diversion points for water rights/permits authorized to withdraw water from the Elm: Northern Brown aquifer in the vicinity of this application are shown in Figure 1. The areas reserved for the future use permits are located outside the boundaries of the map.

The Elm: Northern Brown aquifer is generally a confined aquifer, and due to the physics of artesian head pressure, the drawdown from pumping may extend a considerable distance from the pumped well. SDCL 46-6-6.1 does not protect artesian head pressure as a means of delivery and the Water Management Board has consistently recognized that to place water to maximum beneficial use, a certain amount of drawdown may occur. In order to balance interests between irrigation use and delivery of water by artesian pressure, 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”.

Depending on the specific characteristics of the Elm: Northern Brown aquifer at the well site proposed by this application, some existing well owners may need to lower their pumps to accommodate for deeper water levels. The dugout included as part of this application cannot meet the definition of an adequate well and will not be afforded those protections from other users. There has not been a history of complaints regarding the availability of groundwater in Brown County, except for one that was filed in 1980 regarding the water level in an inadequate well located in Section 21, T126N R63W, approximately 13 miles south of the applicant’s location. This permit, if approved, is not expected to adversely impact adequate wells in the area.

North Dakota

Across the border in North Dakota there has been development of the same aquifer system, albeit with different aquifer names. The nearest application for water use in North Dakota is 2.5 miles north-northeast, and that application is currently deferred until more information about the sustainability of the current aquifer usage is determined (North Dakota State Water Commission Permits; Parkin, 2018). There are a total of five quarter sections within four miles of the applicant’s location and within North Dakota that are currently deferred for the same reason, including one for the applicant. There are also two quarter sections within the same area that are held in abeyance.

SDCL 46-2A-9

Pursuant to SDCL 46-5-6, the diversion rate for an irrigation appropriation cannot be in excess of one cfs for every 70 acres, or “the equivalent thereof”. The statute does provide that the Water Management Board may allow a greater diversion rate if the method of irrigation or soil types so require. Water Permit Application No. 8327-3 proposes to divert up to 1.78 cfs for the irrigation of 116.52 acres, or the equivalent of 1.07 cfs per 70 acres. While the reason for the requested diversion rate was not provided, this application is proposing to use a center pivot that will be unable to complete a full revolution, resulting in insufficient irrigated acreage to meet the statute and still be able to operate the irrigation system at the required pressure.

CONCLUSIONS

1. Water Permit Application No. 8327-3 proposes to irrigate 116.52 acres with a maximum diversion rate of 1.78 cfs from three wells and a dugout to be completed into the Elm: Northern Brown aquifer in Brown County.
2. Based on observation well data and the hydrologic budget, there is a reasonable probability that unappropriated water is available from the Elm: Northern Brown aquifer.
3. There is a reasonable probability that the diversion proposed by this application will not adversely impact adequate wells for existing water rights and domestic uses.



John Farmer
SD DENR – Water Rights Program

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DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

APR 19 2018

Gary Hokana, Davy Hokana, Deb Honeyman, Cindy Reyes, Sandy Bobzien
c/o Trevor Hokana, Operator
9975 96th Ave SE
Ellendale ND 58436

Dear Mr. Hokana:

Enclosed is Water Permit No. 8327-3 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.

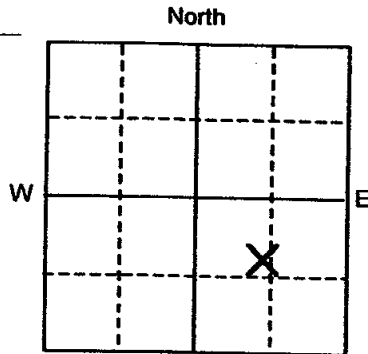
Sincerely,


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

enclosures

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location 1/4 SE 1/4 Sec 10 Twp 128N Rg 63WCounty BrownPlease mark well
location with an "X"Well Completion Date
11-23-2018

1 Mile

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

PROPOSED USE:

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

METHOD OF DRILLING:

Forward Rotary

CASING DATA: ☒ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
class	LB/FT	IN	FT	IN
200	5	+1	82	7 7/8
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
		Lb/gal	FT	FT
Granular Bentonite	5	9.4	0	80
		Lb/gal	FT	FT

Describe grouting procedure

pumped into annulus through a 1" tremie

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 5 Inches Length 20 Feet
 Material PVC
Slot Size .050 Set From 82 Feet to 102 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?
☐ No, Why Not?
 Lab to which water
 quality sample sent for analysis
150 ppm chlorine solution
flushed into wellWell Owner: Trevor Hokana

Business Name: _____

Address: 9975 96 Ave SECity, State, Zip: Ellendale ND 58436

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Topsoil	0	1
Yellow clay	1	14
Oxidized sand to gravel	14	16
Blue Clay	16	30
Fine gray sand	30	39
Blue Clay	39	80
Coarse Gravel	80	105

STATIC WATER LEVEL 8.25 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: pumped with 3-P submersible for 96 hrs and drew pumping level down to 82☐ Bailed☐ Other

Pumping Level Below Land Surface

82 Ft. After 96 Hrs. pumped 80 GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

Test well pumped down to top of aquifer after 96 hrs @ 80 gpm

This well was drilled under license # 285 and this report is true and accurate.Drilling firm: Manikowski Well Drilling Inc.

Signature of License Representative: _____

Byron Manikowski

Signature of Well Owner or Equitable Property Holder: _____

RECEIVED

DEC 03 2018

WATER RIGHT
PROGRAMDate: 11-26-2018

SOUTH DAKOTA WATER WELL COMPLETION REPORT

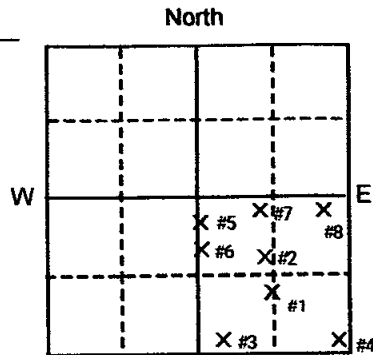
8327-3

11-02

Location 1/4 SE 1/4 Sec 10 Twp 128N Rg 63W

County Brown

Please mark well location with an "X"



Well Completion Date

11-23-2018

← 1 Mile →

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

PROPOSED USE:

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

METHOD OF DRILLING:

Forward Rotary

CASING DATA: ☐ Steel ☐ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Granular Bentonite	42	9.4 Lb/gal	FT	FT
		Lb/gal	FT	FT

Describe grouting procedure

pumped into each test hole through a T tremie

SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter _____ Inches Length _____ Feet

Material _____

Slot Size _____ Set From _____ Feet to _____ 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? _____

☐ No, Why Not? _____

Lab to which water quality sample sent for analysis _____

Well Owner: Trevor Hokana

Business Name: _____

Address: 9975 96 Ave SE

City, State, Zip: Ellendale ND 58436

WELL LOG:

DEPTH

FORMATION

FROM

TO

See Attached logs

STATIC WATER LEVEL

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: _____

☐ Bailed

☐ Other _____

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

This well was drilled under license # 285 and this report is true and accurate.

Drilling firm: Manikowski Well Drilling Inc.

Signature of License Representative: _____

Byron Manikowski

Signature of Well Owner or Equitable Property Holder: _____

RECEIVED

DEC 03 2018

Date: 11-26-2018

WATER RIGHTS
PROGRAM

Hole#1
11-13-18
.25 mi W 392 Ave & 17 mi. N of 102 St

0-1.	Topsoil
1-18.	Yellow clay
18-30	Oxidized gravel with yellow clay
30-45	Blue clay
45-54.	Fine sand to med. (.020 2040)
54-60.	Med to coarse sand (.030 80-120)
60-70	Fine sand to med. (.020 2040)
70-80.	Fine silty sand more clay with depth
80-120	Fine silty sand with clay
120-135.	Blue clay with fine sand layers
135-152.	Blue clay with gravel strips
152-160.	Gravel. With clay layers
160-165	Blue clay till
165-169.	Sand to gravel
169-200.	Till (narrow gravel layers mostly clay)

Hole #2
11-13-18
.29 mi W of 392 Ave & .32 mi. N of 102 St
1413

0-1.	Topsoil
1-14.	Yellow clay
14-16.	Oxidized sand and gravel
16-30.	Blue clay
30-39.	Fine gray sand
39-80.	Blue clay
80-100.	Coarse clean gravel

(Took Water mixed 7 bags mud)

Hole #3
11-20-18
405' N of 102st & .41mi W of 392Ave

0-24	Yellow clay till
24-26.	Oxidized sand and gravel
26-51.	Blue clay
51-60.	Fine to medium sand
60-70.	Fine to medium sand, better
70-75.	Fine to med better still
75-80.	Fine to med sand finer again
80-85.	Fine silty sand mud turning gray
85-95.	Silty blue clay
95-100.	Silty Blue clay
100-121.	Silty blue clay
121-124.	Clean gravel
124-180	Blue clay till
180-255.	Blue clay till
255.	Rock
255-260.	Shale

Hole #4
11-20-18
200' W of 392 Ave & 200' N of 102 St

0-18.	Yellow clay
18-35.	Blue clay
35-60.	Fine to medium sand
60-90	Silty fine sand
90-110	Silty blue clay
110-120.	Blue clay with 6" sand layers
120-140.	Blue clay till with sand layers
140-160.	Blue clay till

Hole #5

11-21-18

.49 mi W of 392Ave & .43 mi N of 102St

0-8.	Sandy yellow clay
8-12.	Oxidized gravel and yellow clay
12-17.	Yellow clay
17-21.	Blue clay
21-25.	Fine to medium sand, clean
25-35.	Blue clay
35-70.	Fine sand, Silty
70-90.	Soft Silty blue clay
90-106.	Blue clay
106-113.	Gravel, looked same as 80-105 in test hole #2
113-120.	Blue clay

Hole #6

11-21-18

.3 mi N of 102st & .48 mi W of 392ave

0-12.	Yellow clay till
12-14.	Oxidized gravel
14-20.	Blue clay
20-85.	Blue clay
85-87.	Coarse sand
87-95.	Blue clay
95-97.	Rocky clay
97-120.	Blue clay

Hole #7

11-23-18

.29 mi W of 392 Ave & .47mi N of 102 st

0-17.	Yellow clay
17-20.	Oxidized gravel and yellow clay
20-30.	Oxidized sand and gravel.
30-45.	Silty fine gray sand
45-60.	Fine to medium sand, cleaner
60-70.	Fine silty gray sand
70-80.	Silty blue clay
80-92.	Blue clay
92-97.	Gravel as in #2, lost circulation

Hole #8

11-23-18

450' W of 392 & .41 mi N of 102

0-15.	Sandy yellow clay
15-20.	Fine to medium sand, blue clay layer
20-25.	Sand to gravel, blue clay
25-100.	Blue clay, Rock