

WATER PERMIT NO. 7432-3

Name of Applicant: HCM Schaffer Inc.

Address: 30634 115th St, Mound City SD 57646 Phone: 605 955-3566

Amount of Water Claimed: 3.56 cfs Total Acres: 320

Source of Water Supply: groundwater (one well)

Water to be used for: irrigation County: Campbell

Type of Waste Disposal System:

Location: 1 mile southeast of Mound City

PRIORITY Date Received: 9-14-12 Application/License Fee: \$ 1350

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

Remarks:

Diversion Point: NW 1/4 SE 1/4 Sec 21-T126N-
R76W

Land to be Irrigated: SW 1/4 Sec 22, NW 1/4 Sec
27; all in T126N-R76W

Depth of Well: 250 feet deep

Well Driller: Manikowski Well Drilling Inc.

Remarks:

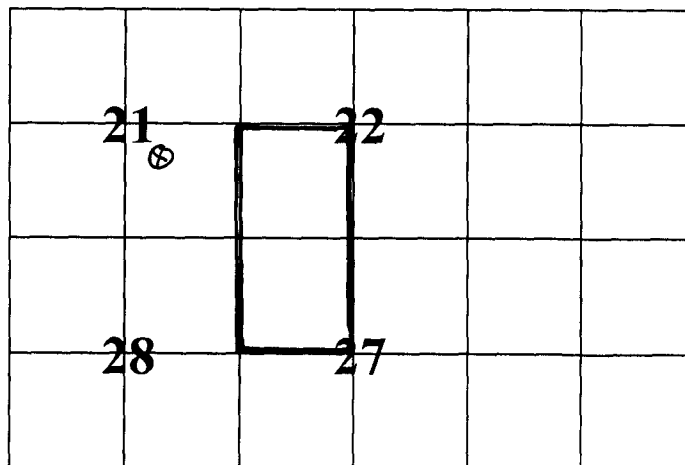
Type of Map: aerial

Prepared by: Christine Leusian, FSA

Reviewed and the Number Assigned on: 9-17-12

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____



Mail to: PMB 2020 DENR - Water Rights 523 E Capitol Ave Pierre, SD 57501-3182 ph. (605) 773-3352	No. <u>7432-3</u> (office use only) Hydrologic Unit <u>10130106</u>
	Basin <u>Missouri River</u>
	Newspaper <u>Prairie Pioneer P.O. Box 318 Pierre SD 57501</u>

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SEP 14 2012
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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 of Applicant HCM Schaffer Inc Phone 605-955-3566
(check one) Owner ☒ Tenant/lessee
Mailing Address 30634 115TH STREET Mound City SD 57646
(Address) (City) (State) (Zip Code)

2. Amount of water claimed 3.55 *CFS or 1600 **GPM ***AF Total Acreage 320
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)

3. Source of water supply well + pump

4. Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W) County Campbell
NW1/4 SE1/4 21-126-76

5. County or counties where water will be used Campbell

6. Annual period during which water is to be used may 1 - October 31

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
NE 1/4 SW 1/4 22-126-76	40	NE 1/4 NW 1/4 27-126-76	40
NW 1/4 SW 1/4 22-126-76	40	NW 1/4 NW 1/4 27-126-76	40
SE 1/4 SW 1/4 22-126-76	40	SE 1/4 NW 1/4 27-126-76	40
SW 1/4 SW 1/4 22-126-76	40	SW 1/4 NW 1/4 27-126-76	40

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

apply water with center pivot by well and pipeline

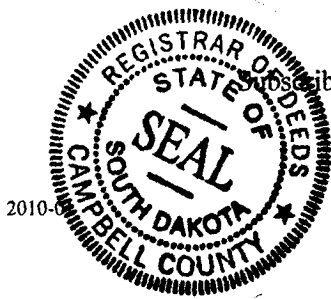
STATE OF SOUTH DAKOTA)
County of Campbell) SS

Attachments: Attach Form 2A if diversion is from a well or dugout, or if storage of water is proposed. Also, attach map and any other technical information. (see instructions)

I, Craig Schaffer, the applicant, certify that I have read this application, have examined the attached map and that the matters stated are true and that I intend, and am able to complete the necessary construction.

Applicant's signature Craig Schaffer
Subscribed and sworn to before me this 12th day of September 20 12

Nancy Turner, Campbell Co. Reg. of Deeds
Notary Public signature



**SOUTH DAKOTA
WATER PERMIT NO. 7432-3**

Date of first receipt of application September 14, 2012.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 7432-3 to HCM Schaffer Inc., c/o Craig Schaffer, 30634 115th St, Mound City SD 57646 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. 7432-3 appropriates 3.56 cubic feet of water per second from one well to be completed into the Grand Aquifer (250 feet deep) located in NW 1/4 SE 1/4 Section 21 for irrigation of 320 acres located in the SW 1/4 Section 22 and NW 1/4 Section 27; all in T126N-R76W.
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 – October 31.
3. The date from which applicant may claim right is September 14, 2012
4. The date of approval of Permit No. 7432-3 is December 3, 2012.
5. One-fifth of the construction is to be completed on or before June 3, 2015.
6. All construction is to be completed on or before December 3, 2017.
7. Water is to be put to beneficial use on or before December 3, 2021.
8. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The well authorized by Permit No. 7432-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

WATER MANAGEMENT BOARD

By: Garland Erbele

Garland Erbele, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

JAN 07 2013

date

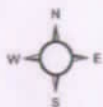




United States Department of Agriculture Farm Service Agency



South Dakota Campbell County



1:8,087

USDA FSA maps are for FSA Program administration only. This map does not represent a legal survey or reflect actual ownership, rather it depicts the information provided directly from the producer and/or the 2008 ortho rectified imagery for South Dakota. The producer accepts the data "as is" and assumes all risks associated with its use. The USDA Farm Service Agency assumes no responsibility for actual or consequential damage incurred as a result of any user's reliance on this data outside of FSA Program. Without identifiers do not represent the size, shape or specific determination of the area. Refer to your original determination (CPA-026 and attached maps) for exact wetland boundaries and determination, or contact NRCS.

Farm Number
748

Township-Range-Section
126N76W22

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Legend

- Restricted Use
- ▼ Limited Restrictions
- Exempt from Conservation Compliance Provisions
- CLU Field Boundary
- Tract Boundary

Apr 08, 2009



United States Department of Agriculture Farm Service Agency



South Dakota Campbell County



1:8,127

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Wetland identifiers do not represent the size, shape or specific determination of the area. Refer to your original determination (CPA-626 and attached maps) for exact wetland boundaries and determinations, or contact NRCS.

Farm Number
748

Township-Range-Section
126N76W27

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WATER RICK
PROGR

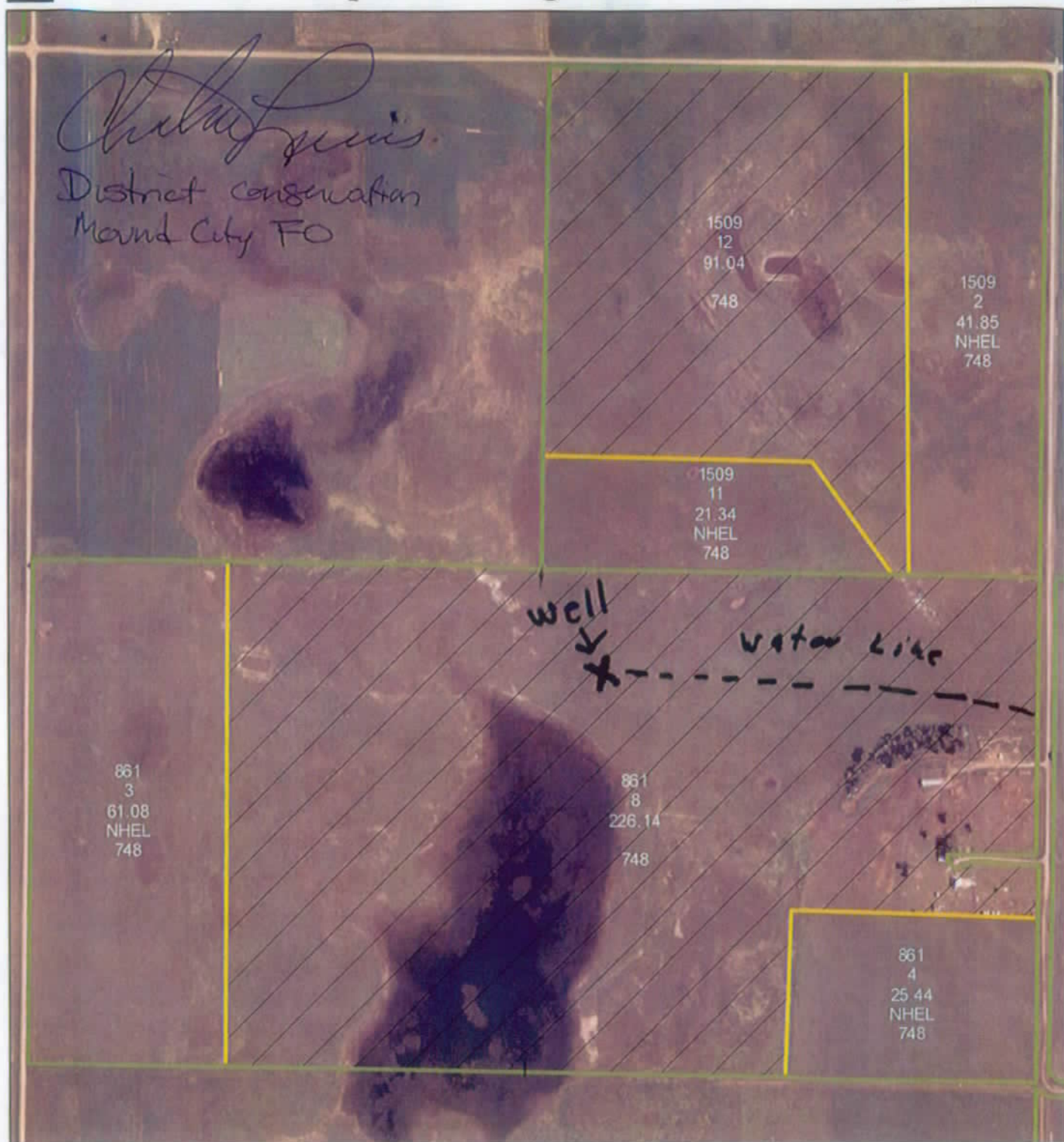
Legend

- Restricted Use
- Limited Restrictions
- Exempt from Conservation Compliance Provisions
- CLU Field Boundary
- Tract Boundary

Apr 08, 2009



United States Department of Agriculture Farm Service Agency



South Dakota Campbell County

Farm Number
748

Township-Range-Section
126N76W21

Legend

- Restricted Use
- ▼ Limited Restrictions
- Exempt from Conservation Compliance Provisions
- CLU Field Boundary
- Tract Boundary



1:8,222

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SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NW 1/4 SE 1/4 Sec 21 Twp 126 N Rg 14 W

County Cambell

Please mark well location with an "X"

Well completion Date 3-21-12

Distance from nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.) 1500 ft. from Feed lot (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
<u>SDR21 LB/FT</u>	<u>4</u> IN	<u>1</u> FT	<u>FT</u>	<u>IN</u>
<u>LB/FT</u>	<u>IN</u>	<u>FT</u>	<u>FT</u>	<u>IN</u>
<u>LB/FT</u>	<u>IN</u>	<u>FT</u>	<u>FT</u>	<u>IN</u>

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
<u>Portland Cement Grout</u>	<u>7</u>	<u>9.5</u> Lb/gal	<u>0</u> Ft	<u>215</u> Ft
		Lb/gal	Ft	Ft

Describe grouting procedure Tremie line bottom to top

SCREEN: ☐ Perforated pipe ☒ Manufactured

Diameter 4 Inches Length 16 Feet

Material MVC

Slot Size 10/32 Set From 234 Feet to 250 Feet

Other information _____

WAS A PACKER OR SEAL USED? ☐ Yes ☒ No

If so, what material? _____

Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? chlorine

☐ No, Why Not? NDSU

Lab sample sent to for water quality analysis _____

Well Owner: Craig Schaffer

Business Name: HCM Schaffer, Inc.

Address1: 30634 115th St

Address2: _____

City, State, Zip: Mound City, SD 57646

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
<u>Top Soil</u>	<u>0</u>	<u>1</u>
<u>Yellow clay</u>	<u>1</u>	<u>20</u>
<u>Soft Blue clay</u>	<u>20</u>	<u>75</u>
<u>Blue clay till</u>	<u>75</u>	<u>132</u>
<u>Gravel</u>	<u>132</u>	<u>136</u>
<u>Blue clay till</u>	<u>136</u>	<u>219</u>
<u>Fine to medium sand</u>	<u>219</u>	<u>234</u>
<u>Coarse sand & gravel</u>	<u>234</u>	<u>250</u>
<u>Coarse sand & lignite</u>	<u>250</u>	<u>255</u>

STATIC WATER LEVEL 22 FEET shale

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: Submersible Pump

☐ Bailed

☐ Other

Pumping Level Below Land Surface

32 Ft. After 3 Hrs. pumped 100 GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

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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: _____

Date: _____

Please return White Copy to DENR Water Rights

523 E. Capitol Ave., Pierre SD 57501

Soil and Water Testing Laboratory

NDSU Department 7680

PO Box 6050

Fargo, ND 58108-6050

701-231-9465

Date: 4-4-12

Submitted by:

Manikowski Well Drilling, Inc.

10020 Co. Rd. 19

Lidgerwood, ND 58053

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Laboratory Sample ID: 2012-0039

Customer Sample ID: Campbell County - T 126N R 76W Sec 21 SE Q

Water Analyses

pH	EC	TDS	Hardness	SAR	SAR Adj	RSC
7.4	1289	1052	461	2.09	2.67	-1.33

EC = Electrical Conductivity (total salts), reported in micro-ohms/cm

TDS = Total Dissolved Solids, reported in mg/L (ppm)

Hardness reported in mg/L (ppm), calculated from concentrations of calcium and magnesium

SAR = Sodium Adsorption Ratio, a comparison of the sodium content to the calcium and magnesium content, used to determine suitability of the water for irrigation purposes

SAR Adj = SAR adjusted for high bicarbonates

RSC = Residual Sodium Carbonate, values greater than 0 increase the sodium hazard

	meq/L	mg/L (ppm)
Carbonates (CO ₃)	0.00	0
Bicarbonates (HCO ₃)	7.88	481
Chlorides (Cl)	0.57	20
Sulfates (SO ₄)	5.65	272
Calcium (Ca)	6.09	122
Magnesium (Mg)	3.13	38
Sodium (Na)	4.48	103
Potassium (K)	0.41	16

Soil and Water Testing Laboratory
 NDSU Department 7680
 PO Box 6050
 Fargo, ND 58108-6050
 701-231-9465

Date: 4-4-12

Test Method: Saturation Extract Soluble Ion Analysis

Lab #: 4765

Submitted by:

Manikowski Well Drilling, Inc.
 10020 County Rd 19
 Lidgerwood, ND 58053

Soil Analyses

Sample ID	Saturation Percent	pH	EC micro-ohms/cm	CO3 meq/L	HCO3 meq/L	Cl meq/L	SO4 meq/L	Ca meq/L	Mg meq/L	Na meq/L	K meq/L	SAR	CO3 mg/L	HCO3 mg/L	Cl mg/L	SO4 mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L
Campbell	27	6.6	589					3.24	1.73	1.30		0.828					65	21		30

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date 9/17, 20 12

RECEIVED OF H C & Schaeffer Inc 30634 115th St Mound City SD 57646

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

Fee for Application for Permit No. <u>7432-3</u> to Appropriate Water, to construct and to put water to beneficial use	1150	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>7432-3</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	1350 00

No. 05577

By

Charles E. Erbe
Chief Engineer



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 7432-3, HCM Schaffer Inc.**

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. 7432-3, HCM Schaffer Inc., c/o Craig Schaffer, 30634 115th Street, Mound City SD 57646.

The Chief Engineer is recommending APPROVAL of Application No. 7432-3 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) it is in the public interest with the following qualifications:

1. The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The well authorized by Permit No. 7432-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

See report on application for additional information.

Garland Erbele, Chief Engineer
November 9, 2012

NOTE: In most locations the Grand Aquifer has medium sodium hazard and high salinity hazard. DENR encourages you to have a soil water compatibility analysis performed to insure the water is suitable for irrigation. The Water Resources Institute at SDSU or other qualified soil scientist can assist you in making a soil water compatibility determination and recommend if there are water management techniques to implement to optimize crop production and protect the soil structure.

REPORT TO THE CHIEF ENIGNEER
ON
WATER PERMIT APPLICATION NO. 7432-3
HCM SCHAFFER INC.
OCTOBER 31, 2012

Water Permit Application No. 7432-3 proposes to appropriate 640 acre-feet per year (ac-ft/yr) at a maximum diversion rate of 3.56 cubic feet of water per second (cfs) from one well to be completed into the Grand aquifer. The well is expected to be approximately 250 feet deep and is to be located in the approximate center of Section 1, T92N-R53W. One well is to be located in the NW¼ SE¼ of Section 21, T116N-R53W. This permit application proposes to irrigate 320 acres located in the SW¼ of Section 22 and the NW¼ of Section 27, all in T116N-R53W in Campbell County.

AQUIFER: Grand aquifer (G)

GEOLOGY AND AQUIFER CHARACTERISTICS:

The Grand aquifer consists of glacial outwash and alluvium from the ancient Grand River channel and is under artesian conditions in this area (Koch, 1970). In total, the Grand aquifer underlies six counties with an area of 405,100 acres and contains an estimated 3,637,000 acre-feet (ac-ft) of water in storage. In Campbell County alone, the aquifer underlies 97,900 acres and contains an estimated 1,469,000 ac-ft of water in storage (Hedges and others, 1982). The aquifer is hydraulically connected to the Oahe reservoir of the Missouri River, causing water levels in the aquifer to fluctuate with reservoir levels. In the area of the proposed well, water in the aquifer generally moves from south to north and has a transmissivity estimated between 50,000 and 100,000 gallons per day per foot (gal/day/ft) (Koch, 1970).

Koch (1970) indicated that the top of the Grand aquifer ranges from 150 feet to 300 feet below ground surface, with an average thickness of 100 feet. Hedges (1972) indicated that in this location the aquifer lies between 220 and 270 feet below ground surface. Test hole information submitted with this application indicates that the aquifer occurs from 217 to 255 feet below ground surface, and the static water level is at 22 feet below ground surface.

In most locations, the Grand aquifer has a high salinity hazard and a medium sodium hazard, so special management practices may be necessary (Koch, 1970). A water analysis and a soil analysis were submitted with this application. A professional examination of the water and soil quality analysis is recommended.

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 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 from the aquifer and pertinent to this application.

WATER AVAILABILITY:

This application proposes to appropriate 640 ac-ft/yr from the Grand aquifer. If this application is approved, the actual water use will likely be less than the appropriation. 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 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.”

HYDROLOGIC BUDGET:*Recharge:*

Recharge to the Grand aquifer occurs by infiltration of water where permeable layers overlie the aquifer and inflow from adjacent subsurface areas. Recharge of the Grand aquifer in Campbell County has been not been quantified. However, Koch (1970) attempted to estimate recharge to the Grand aquifer in Campbell County in the year 1966 by calculating subsurface outflow of adjacent counties based on transmissivity, hydraulic gradient, and cross-sectional area. To maintain a constant water level in an aquifer, recharge must equal discharge. Therefore, the estimated 4.5 million gallons per day (gal/day) outflow of the aquifer from adjacent counties, equaling approximately 5,040 ac-ft/yr, must be equal to recharge to the aquifer in Campbell County or subsurface inflow. Also, water level data indicated more storage of water in the Grand aquifer in Campbell County from 1965 to 1967, indicating that recharge actually exceeded outflow. This method of analysis does not indicate that recharge equals 5,040 ac-ft/yr, but provides insight to order of magnitude of the recharge to the aquifer in Campbell County.

Discharge:

Discharge from the Grand aquifer may occur due to outflow to adjacent subsurface areas dry years and well withdrawals from commercial use, industrial use, municipal use, and irrigation. There are a total of 38 water rights/permits authorizing wells to appropriate water from the Grand aquifer, with 26 of these water rights/permits in Campbell County (Water Rights, 2012b).

From the entire Grand aquifer, diversion rate appropriation for commercial, industrial, and municipal use totals 1.552, 0.67, and 4.75 cfs, respectively. From the Grand aquifer in Campbell County, diversion rate appropriation for commercial, industrial, and municipal use totals 0.035, 0.67, and 2.73 cfs, respectively. There are no future use permits (Water Rights, 2012b).

The amount of water that can be expected to be withdrawn by the non-irrigation water rights/permits at the current appropriation amount can be estimated by assuming: 1) water rights/permits limited by an annual volume will pump the entire volume appropriated annually, 2) water rights/permits limited only by diversion rate will pump at the maximum permitted diversion rate at 60 percent of the time, and 3) future use permits can be fully developed. At the current appropriation amount, the total annual withdrawal from the entire Grand aquifer by non-irrigation use is expected to total less than 3,029 ac-ft/yr and the total withdrawal from the Grand aquifer in Campbell County by non-irrigation use is expected to total less than 1,492 ac-ft/yr.

In 2011, water appropriated from the Grand aquifer for irrigation totaled 13,219.4 ac-ft/yr, with 11,758.4 ac-ft/yr appropriated in Campbell County. Pumpage reported withdrawing from the

Grand aquifer totaled 2,428.52 ac-ft/yr, all of which was pumped in Campbell County (Water Rights, 1979-2011). Figure 1 shows the Grand aquifer's historic irrigation data.

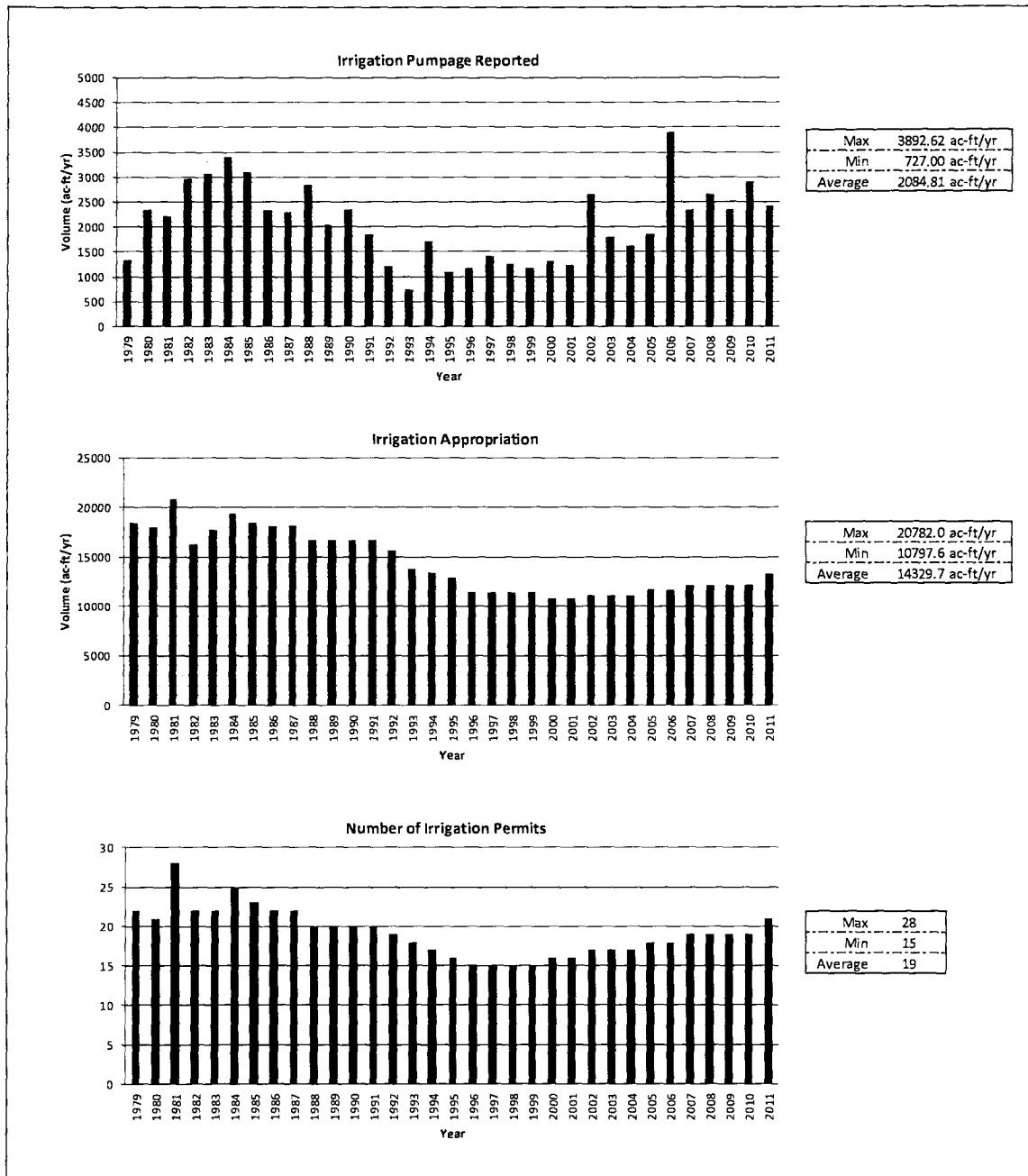


Figure 1: Historic irrigation water use from the Grand aquifer (Water Rights, 1979-2011)

In addition, there are many completion reports on file with the SD DENR-Water Rights Program in Campbell County for domestic wells that appear to be completed into the Grand aquifer (Water Rights, 2012c). The annual withdrawal due to domestic use is not significant to the hydrologic budget of the aquifer.

Hydrologic Budget:

Discharge from the Grand aquifer in Campbell County due to well withdrawal is estimated to be no more than 4,000 ac-ft/yr, which is less than the estimation of recharge indicating an order of magnitude. Therefore, there is a reasonable probability that unappropriated water is available from the Grand aquifer for the proposed appropriation of 640 ac-ft/yr.

OBSERVATION WELL DATA:

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

The DENR-Water Rights Program monitors 37 observation wells located into the Grand aquifer, with 17 of these observation wells located in Campbell County. The nearest of these wells, CA-65C and CA-78E, are located approximately three quarters of a mile northeast and one and a half miles south-southwest of the proposed well site, respectively (Water Rights, 2012a). Hydrographs of these observation wells are shown in Figures 2 and 3.

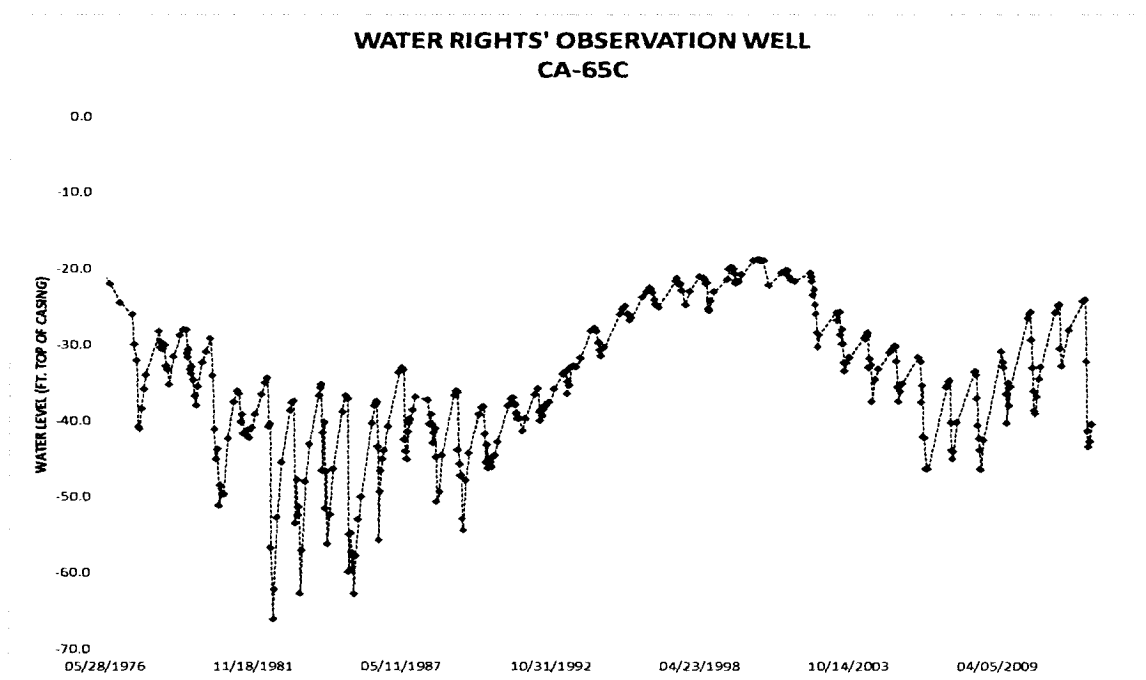


Figure 2: Hydrograph for DENR-Water Rights' observation well CA-65C (Water Rights, 2012a)

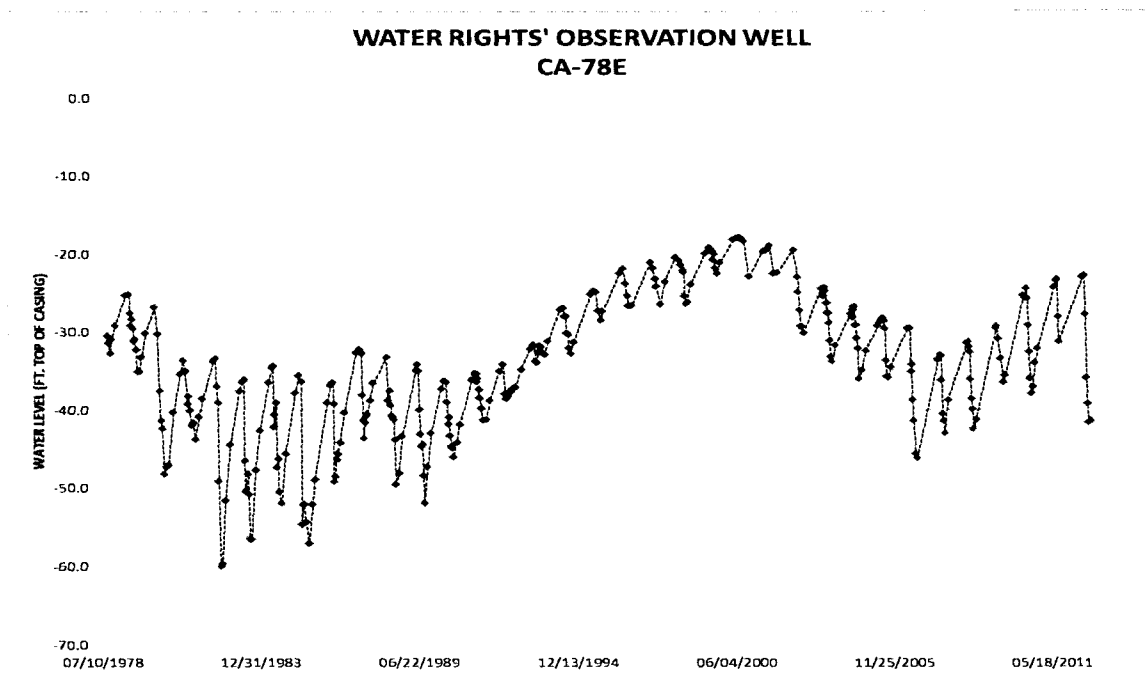


Figure 3: Hydrograph for DENR-Water Rights' observation well CA-78E (Water Rights, 2012a)

The observation well data documents cyclic conditions of water levels, recharging during wet years and declining during dry years. The general increase in water level of the observation wells indicates that there is an increase of water in the aquifer over the period of record. This data documents that, at the current level of development, temporal well withdrawal is masked by climatic conditions. Therefore, recharge to and natural discharge from the Grand aquifer significantly exceeds pumping. Also consider that natural discharge can also be captured for pumping. These hydrographs indicate that unappropriated water is available from the Grand aquifer to support the proposed appropriation of 640 ac-ft/yr at the proposed well site.

EXISTING WATER RIGHTS:

There are a total of 38 water rights/permits appropriating water from the Grand aquifer. There are five water rights/permits within five miles of the proposed well site. The nearest water right is located 0.85 miles northwest of the proposed well site and the nearest domestic well on record with the SD DENR-Water Rights Program is located 0.85 miles east of the proposed well site (Water Rights, 2012b; Water Rights, 2012c).

Because the Grand aquifer is under confined conditions, drawdown in a well may be significant. The test hole information submitted with this application indicates that the specific capacity of the well is approximately 10 gallons per minute per foot of drawdown (gpm/ft) at 100 gallons per minute (gpm) and there is approximately 195 feet of head pressure in the area of the proposed well site. Based on this specific capacity and the proposed diversion rate, drawdown in the well can be expected to be approximately 160 feet. Transmissivity for the aquifer can be estimated to be 20,000 gal/day/ft ("Transmissivity From Specific Capacity").

REFERENCES:

- Hedges, L.S., Burch, S.L., Iles, D.L., Barari, R.A., and Schoon, R.A. 1982. Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota and Iowa, Task 1: Bedrock Topography and Distribution, Task 2: Extent of Aquifers, Task 3: Ground-Water Storage, Task 4: Computerized Data Base, Final Report. U.S. Army Corps of Engineers Contract DACW 45-80-C-0185.
- Hedges, L.S. 1972. Geology and Water Resources of Campbell County, South Dakota, Part I: Geology: South Dakota Geological Survey Bulletin-20(1)-Plate 4, 39 p.
- Koch, N.C., 1970, Geology and Water Resources of Campbell County, South Dakota; Part II: Water Resources: South Dakota Geological Survey Bulletin B-20(2), 38 p.
- “Theis Equation Calculator.” I-calcul8 Calculators and Tools. 21 October 2012
< <http://www.icalcul8.com/theis.php>>
- “Transmissivity from Specific Capacity.” Aquifer Test Forum sponsored by HydroSOLVE, Inc.
31 October 2012 < <http://www.aqtesolv.com/forum/transcap.asp>>
- Water Rights. 1979-2011. “Annual Irrigation Summary by Aquifer”: SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, SD.
- Water Rights. 2012a. Observation Well Files, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, SD.
- Water Rights. 2012b. Water Right/Permit Files, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, SD.
- Water Rights. 2012c. Water Well Completion Reports, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, SD.

A distance-drawdown curve, shown in Figure 4, was developed using these parameters in the Theis equation ("Theis Equation Calculator"). This plot, while only an approximation, illustrates that at the distances of the involved existing wells to the proposed well site, drawdown is not significant when considering head pressure of area. Therefore, interference due to the proposed well is not expected to adversely or unlawfully impair existing water rights.

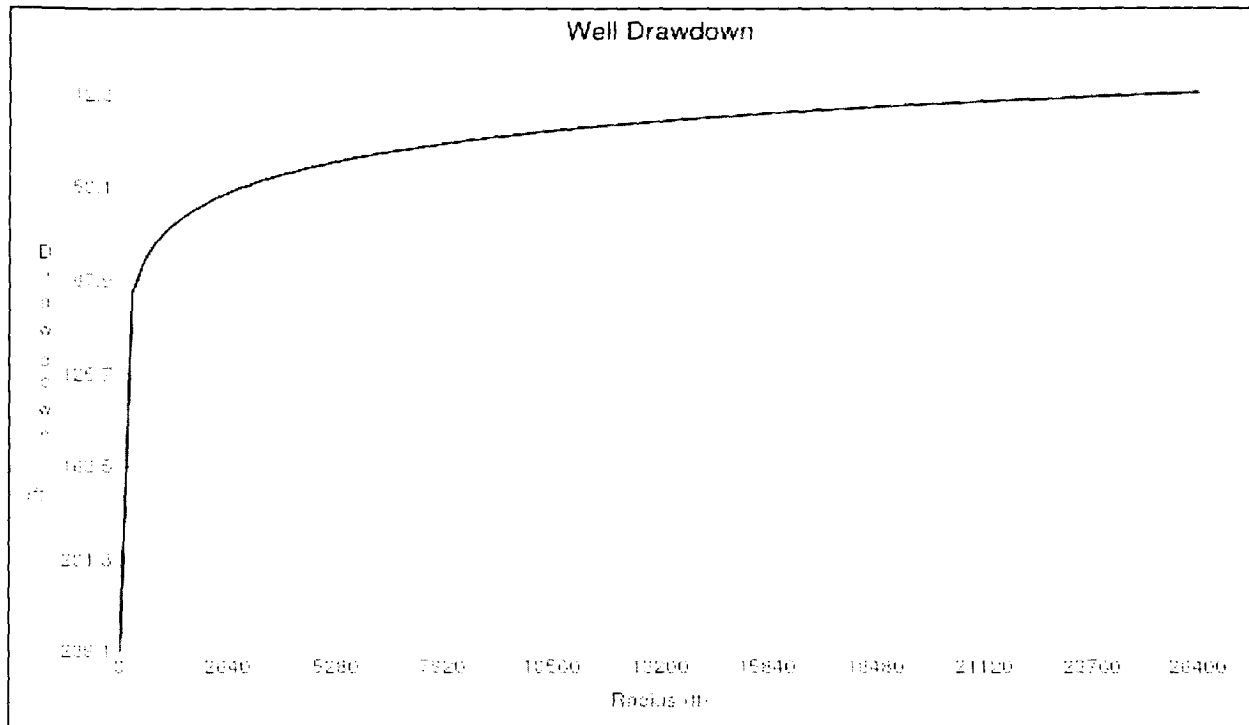


Figure 4: Distance-drawdown curve for proposed well.

CONCLUSIONS:

1. The application proposes to appropriate 640 ac-ft/yr for irrigation at two well sites.
2. There is a reasonable probability that unappropriated water is available from the Grand aquifer to supply the proposed appropriation.
3. While well interference may occur, there is a reasonable probability that this proposed well will not adversely or unlawfully impair existing nearby wells.
4. Special management practices may be necessary for irrigation due to the water quality of the Grand aquifer.

Joseph R Stonesifer
SD DENR-Water Rights Program

RECEIVED

Form 8

NOV 26 2012

WATER RIGHTS
PROGRAM

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)

County of Campbell) SS

I, Leah Burke

certify that the attached printed Notice was taken

from the Prairie Pioneer

printed and published in Pellecte

County of Campbell and

state of South Dakota. The notice was published

in the newspaper on the following date:

11/22/12

Cost of Printing \$2125

Leah Burke
(Signature)

publisher
(Title)

11/22/12
(Date Signed)

NOTICE OF APPLICATION
NO. 7432-3

to Appropriate Water
Notice is given that HCM Schaffer Inc., c/o Craig Schaffer, 30634 115th St, Mound City SD 57646 has filed an application for a water permit to appropriate 3.56 cubic feet of water per second from one well to be completed into the Grand Aquifer (250 feet deep) located in NW 1/4 SE 1/4 Section 21 for irrigation of 320 acres located in the SW 1/4 Section 22 and NW 1/4 Section 27; all in T126N-R76W.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7432-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by December 3, 2012.

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. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

Published once at the total approximate cost of \$21.25

RECEIVED

NOV 26 2012

Form 8

WATER RIGHTS
PROGRAM

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County of Brown) SS

I, _____

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:

November 21, 2012

Cost of Printing 43.75

May Baskin
(Signature)

Adv. Billings Special
(Title)

November 23, 2012
(Date Signed)

(No. 1478583)
Nov. 21, 2012 - 1T)

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to Appropriate Water

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Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7432-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

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DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

November 13, 2012

Prairie Pioneer
PO Box 218
Pollock SD 57648

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 7432-3 to Appropriate Water. Please publish the notice once on November 21, 2012. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352.

The applicant must verify to you that the notice is to be published and arrange for payment. **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is HCM Schaffer Inc., c/o Craig Schaffer, 30634 115th St., Mound City SD 57646 (Ph # 605-955-3566).

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

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

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

November 13, 2012

American News
PO Box 4430
Aberdeen SD 57402

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 7432-3 to Appropriate Water. Please publish the notice once on November 21, 2012. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352.

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605 773-3352

enclosures



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

NOTE: TO BE SURE OF PUBLICATION ON
THE CORRECT DATE, CONTACT
THE NEWSPAPER(S) RIGHT AWAY.

November 13, 2012

HCM Schaffer Inc
Craig Schaffer
30634 115th St
Mound City SD 57646

Dear Mr. Schaffer:

Water Permit Application No. 7432-3 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 Prairie Pioneer printed at Pollock SD (Ph # 605-889-2320) and the American News printed at Aberdeen SD (Ph # 605-225-4100). You will need to contact the newspaper(s) and authorize publication of this notice. For your information, a copy of the notice, the recommendation of the Chief Engineer and report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

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

Sincerely,

Eric Grönlund
Natural Resources Engineer
(605) 773-3352

enclosures

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

Instruction to Newspaper - Publish the Notice on November 21, 2012. The applicant is responsible for payment. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352 or email: Karen.schlaak@state.sd.us.

NOTICE OF APPLICATION NO. 7432-3 to Appropriate Water

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Published once at the total approximate cost of_____.



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

JAN 07 2013

HCM Schaffer Inc
Craig Schaffer
30634 115th St
Mound City SD 57646

Dear Mr. Schaffer:

Enclosed is Water Permit No. 7432-3 authorizing construction of your 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,

Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

SOUTH DAKOTA WATER WELL COMPLETION REPORT

7432-3

11-02

Location <u>NW 1/4 SE 1/4</u> Sec <u>21</u> Twp <u>126N</u> Rg <u>76W</u> County <u>Cambell</u> Please mark well location with an "X" Well completion Date <u>12-4-12</u> Distance from nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.) <u>1500</u> ft. from <u>septic tank</u> (identify source)		Well Owner: <u>Craig Schaffer</u> Business Name: <u>HCM Schaffer, Inc.</u> Address1: <u>30634 115 st</u> Address2: _____ City, State, Zip: <u>Mound C. Ty, SD 57646</u> WELL LOG: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">FORMATION</th> <th colspan="2">DEPTH</th> </tr> <tr> <th>FROM</th> <th>TO</th> </tr> </thead> <tbody> <tr><td><u>Top Soil</u></td><td><u>0</u></td><td><u>1</u></td></tr> <tr><td><u>yellow clay</u></td><td><u>1</u></td><td><u>20</u></td></tr> <tr><td><u>soft Blue clay</u></td><td><u>20</u></td><td><u>75</u></td></tr> <tr><td><u>Blue clay Till</u></td><td><u>75</u></td><td><u>132</u></td></tr> <tr><td><u>sand & Gravel</u></td><td><u>132</u></td><td><u>136</u></td></tr> <tr><td><u>Blue clay Till</u></td><td><u>136</u></td><td><u>217</u></td></tr> <tr><td><u>Fine sand</u></td><td><u>217</u></td><td><u>234</u></td></tr> <tr><td><u>medium sand & Gravel</u></td><td><u>234</u></td><td><u>256</u></td></tr> <tr><td><u>Shale</u></td><td><u>256</u></td><td><u>260</u></td></tr> </tbody> </table>		FORMATION	DEPTH		FROM	TO	<u>Top Soil</u>	<u>0</u>	<u>1</u>	<u>yellow clay</u>	<u>1</u>	<u>20</u>	<u>soft Blue clay</u>	<u>20</u>	<u>75</u>	<u>Blue clay Till</u>	<u>75</u>	<u>132</u>	<u>sand & Gravel</u>	<u>132</u>	<u>136</u>	<u>Blue clay Till</u>	<u>136</u>	<u>217</u>	<u>Fine sand</u>	<u>217</u>	<u>234</u>	<u>medium sand & Gravel</u>	<u>234</u>	<u>256</u>	<u>Shale</u>	<u>256</u>	<u>260</u>
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PROPOSED USE: ☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes ☒ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well METHOD OF DRILLING: <u>Forward Rotary</u> CASING DATA: ☐ Steel ☒ Plastic ☐ Other If other describe _____ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>PIPEWEIGHT</th> <th>DIAMETER</th> <th>FROM</th> <th>TO</th> <th>HOLE DIAMETER</th> </tr> </thead> <tbody> <tr> <td><u>SDR21 LB/FT</u></td> <td><u>12 IN + 1</u></td> <td><u>FT</u></td> <td><u>236 FT</u></td> <td><u>17 1/2 IN</u></td> </tr> <tr> <td>LB/FT</td> <td>IN</td> <td>FT</td> <td>FT</td> <td>IN</td> </tr> <tr> <td>LB/FT</td> <td>IN</td> <td>FT</td> <td>FT</td> <td>IN</td> </tr> </tbody> </table>		PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER	<u>SDR21 LB/FT</u>	<u>12 IN + 1</u>	<u>FT</u>	<u>236 FT</u>	<u>17 1/2 IN</u>	LB/FT	IN	FT	FT	IN	LB/FT	IN	FT	FT	IN	STATIC WATER LEVEL <u>32</u> 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: <u>Submersible Pump</u> ☐ Bailed ☐ Other Pumping Level Below Land Surface <u>81</u> Ft. After <u>3</u> Hrs. pumped <u>870</u> GPM _____ Ft. After _____ Hrs. pumped _____ GPM If pump installed, pump rate: _____ GPM													
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LB/FT	IN	FT	FT	IN																															
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GROUTING DATA: Grout Type <u>Perlite Grout</u> No. of Sacks <u>45</u> Grout Weight <u>9.5</u> Lb/gal From <u>0</u> Ft To <u>215</u> Ft Describe grouting procedure <u>Tremie line from bottom of hole to surface</u> SCREEN: ☐ Perforated pipe ☒ Manufactured Diameter <u>12</u> Inches Length <u>20</u> Feet Material <u>stainless steel</u> Slot Size <u>1050</u> Set From <u>236</u> Feet to <u>256</u> Feet Other information _____		REMARKS RECEIVED DEC 26 2012 WATER RIGHTS PROGRAM																																	
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? <u>chlorine</u> ☐ No, Why Not? _____ Lab sample sent to for water quality analysis _____		This well was drilled under license # <u>285</u> And this report is true and accurate. Drilling firm: <u>Mani Kowski Well Drilling, Inc.</u> Signature of License Representative: <u>Byron Maniowski</u> Signature of Well Owner or Equitable Property Holder: _____ Date: _____																																	

Please return White Copy to DENR Water Rights

523 E. Capitol Ave., Pierre SD 57501