

WATER PERMIT NO. 7541-3

Name of Applicant: Roger Schuelke

Address: 2747 111th Ave, Marietta MN 56257 Phone: 320 668-2532

Amount of Water Claimed: 2.0 cfs Total Acres: 135 ~~cfs~~ acres

Source of Water Supply: groundwater (one well)

Water to be used for: irrigation County: Grant

Type of Waste Disposal System:

Location: 10 miles southeast of Milbank

PRIORITY Date Received: 11-28-12

Application/License Fee: \$ 1050

Corrected Application Received: 12-5-12

Period of Annual Use: May 1 – Sept 30

Remarks:

Diversion Point: NW 1/4 SE 1/4 Sec 9-T119N-R47W

Land to be Irrigated: SE 1/4 Sec 9-T119N-R47W

Depth of Well: 188 feet deep

Well Driller: Steffl Drilling & Pump

Remarks:

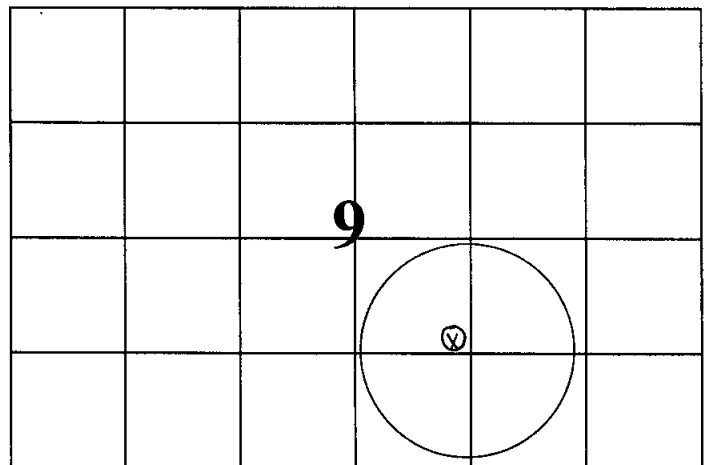
Type of Map: aerial

Prepared by:

Reviewed and the Number Assigned on: 12-5-12

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____



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

Mail to: PMB 2020 DENR - Water Rights 523 E Capitol Ave Pierre, SD 57501-3182 ph. (605) 773-3352	No. <u>7541-3</u>	(office use only) Hydrologic Unit <u>07020001</u>
	Basin <u>Minnesota - Watstone</u>	<u>605-432-4516</u>
	Newspaper <u>Grant Co. Review Box 390 Millbank 57252</u>	<u>605-886-6901</u>
	<u>Public Opinion Box 10 Watstone 57201</u>	

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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 to Appear on Irrigation Permit Roger Schuelke

(check one) ☐ Owner ☐ Tenant/lessee ☐ Owner's Legal Agent

(name and complete address if different than above name)

Mailing Address 2747 11th AVE Marietta MN 56257
(Address) (City) (State) (Zip Code)

Home Phone 320 6682532 Cell 320 226 3837 Email _____

2. Amount of water claimed 2.0 *CFS or ^{estimated} 900 **GPM ***AF Total Acreage 135
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)

3. Source of water supply GROUNDWATER

4. Location of point of diversion Twp 119 R47 sec 9 NW 1/4 x SE 1/4
(example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)

County Grant

5. County or counties where water will be used GRANT

6. Annual period during which water is to be used may 1 through Sept. 30

7. List below each forty acre division, or lot, or fraction thereof and show number of acres to be irrigated in each.
(Attach sheet if more space is needed)

Land Description	Acres	Land Description	Acres
SE 1/4 of sect 9 T-119-N R-47-W	135		

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

6 tower center pivot with a corner system

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

SOUTH DAKOTA
WATER PERMIT NO. 7541-3 FOR IRRIGATION

Date of first receipt of application November 28, 2012.

Date of return to applicant for corrections, amendments or changes November 29, 2012.

Date of receipt of corrected application December 5, 2012.

The Water Management Board approved Water Permit No. 7541-3 on May 2, 2013 for Roger Schuelke, 2747 111th Ave, Marietta MN 56257 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. 7541-3 appropriates 2.0 cubic feet of water per second from one well to be completed into the Granite wash Aquifer (188 feet deep) located in the NW 1/4 SE 1/4 Section 9 for irrigation of 135 acres located in the SE 1/4 Section 9; all in T119N-R47W.
2. The amount of the appropriation may not exceed 2 acre feet annually for each acre of land to which water is actually and beneficially applied for irrigation. The water is to be used during the following described annual period: May 1 – September 30.
3. The date from which applicant may claim right is November 28, 2012.
4. One-fifth of the construction is to be completed on or before November 2, 2015.
5. All construction is to be completed on or before May 2, 2018.
6. Water is to be put to beneficial use on or before May 2, 2022.
7. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

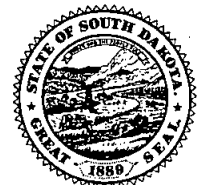
QUALIFICATIONS

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. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.
3. A perpetual easement shall be granted to the State for "Obs-2" completed as part of the aquifer pump test for the purpose of incorporating into the South Dakota Department of Environment and Natural Resources-Water Rights Program Observation Well Network.

WATER MANAGEMENT BOARD

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

JUN 21 2013
date



Preparer: Joe Nadenicek, DENR Staff Attorney
Address: 523 E. Capitol Ave. Joe Foss Bldg
City/State/Zip: Pierre, SD 57501
Phone Number: (605) 773-3836

Document # 226189
STATE OF SOUTH DAKOTA COUNTY OF GRANT-ss
Recorded this 17th day of July, 2013
at 11:15 A. M Book 261 Page 541
Nancy Capeland
Register of Deeds * 30.00 Pd.

EASEMENT AGREEMENT

Agreement made this 18th day of June, 2013, between Roger Schuelke, 2747 111th Ave., Marietta, MN 56257, herein called Owner, and the South Dakota Department of Environment and Natural Resources, Joe Foss Building, 513 E. Capitol, Pierre, SD 57501 herein called State.

The parties agree as follows:

I.

In consideration of the State's performance of the covenants herein, Owner agrees to grant and convey a perpetual easement to State for the purpose of State maintaining an observation well to be located in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 9, T119N-R47W, Grant County, on property owned by the Owner. State also agrees to pay the expense of updating the abstract due to additions or deletions by Easement Agreement.

II.

The observation well described above consists of one well approximately 189 feet deep. The well is as described in the attached well completion report. The observation well will be labeled and distinctively marked by State. The casing will extend above ground surface approximately 3 feet and will be locked.

III.

The observation well described above shall be maintained by State at its sole cost and expense and any damages caused by a broken well will be the responsibility of State. Two steel posts will be installed around the well.

IV.

Owner agrees to leave the observation well and markers described above in an undisturbed condition and agrees not to disturb the surface and subsurface of the land within a three foot radius of the observation well or markers.

NO. 226189

BOOK 261 PAGE 542

V.

It is expressly understood and agreed that State shall have the right to ingress to and egress from the property described above for the purpose of measurement of water levels, maintenance of the well and collection of water samples. State agrees to hold Owner harmless for injury to its employees at the well site and during ingress and egress therefrom; except for injuries caused by the negligent or wrongful acts of the Owner.

VI.

This grant of easement shall run with the land and shall be binding on and shall insure to the benefit of the parties hereto, their heirs, executors, administrators, agents, employees, successors, and assigns.

VII.

This agreement shall remain in force unless and until State abandons the observation well. If State decides to abandon the well, Owner shall be notified in writing of the State's intention to abandon the well and shall have the option of assuming possession of the well. The option must be exercised in writing within 30 days of the notice of intent to abandon. If Owner then chooses not to assume possession of the well, the well shall be plugged at the expense of State, and all markers shall be removed.

Roger Schell

6/10/13

In witness whereof, the parties hereto have duly executed this agreement.

Roger S. Schuelke
Roger Schuelke

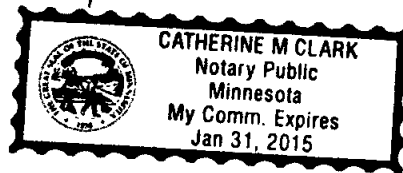
mn
STATE OF ~~SOUTH DAKOTA~~)
COUNTY OF Grant) SS
Lac Qui Pule

On this the 10 day of June, 2013, before me, Catherine Clark
the undersigned officer, personally appeared Roger Schuelke known to me or
satisfactorily proven to be the person(s) whose name(s) subscribed to the within instrument
and acknowledge that he executed that same for the purposed therein contained.

Catherine M Clark

Notary Public

My Commission Expires: 1-31-2015



Steven Pirner
Steven Pirner, Secretary
Department of Environment and Natural Resources

STATE OF SOUTH DAKOTA)
COUNTY OF Hughes) SS

On this the 12 day of June, 2013, before me, Brenda Anderson,
the undersigned officer, personally appeared Steven Pirner, known to me or
satisfactorily proven to be the person(s) whose name(s) subscribed to the within instrument
and acknowledge that he executed that same for the purposed therein contained.

Brenda Anderson
Notary Public
My Commission Expires:

BRENDA ANDERSON, Notary Public
My Commission Expires
October 26, 2016

Supplemental Information

(type or print)

1. Well Information (check one or both as applicable) ☒ Drilling new well(s) ☐ Using existing well(s)

a) If new wells, how many 1 Have test holes been drilled ☒ Yes ☐ No Drilled by Steffl Drilling & Pump Inc
(if yes, please provide copies of logs)

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

c) Well Depth 188' Depth to Top of Water Bearing Material 168' Depth to Water from Surface not known
test well drilled only at this time / estimate 20'

d) Distance to nearest existing domestic well:

On applicant's property _____

On property owned by others 1554'

2. Wastewater Disposal System Information

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

b) System Capacity (gallons) _____ Year Constructed _____

c) Connected to the City of _____ Sanitary System

3. Dugout Information

a) Surface Dimensions _____ Depth _____

b) Depth to water (ground surface to water level) 260

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)

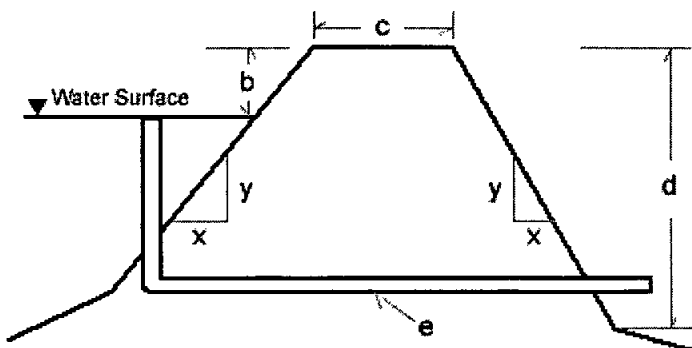
Upstream _____

Downstream _____

h) Surface Area of Impoundment _____

i) Storage _____ Acre Feet

j) Drainage Area Above Dam _____ Acres



Sec 5
T119N
R47W

Sec 4
T119N
R47W

Sec 3
T119N
R47W

Sec 8
T119N
R47W

Sec 9
T119N
R47W

Sec 10
T119N
R47W

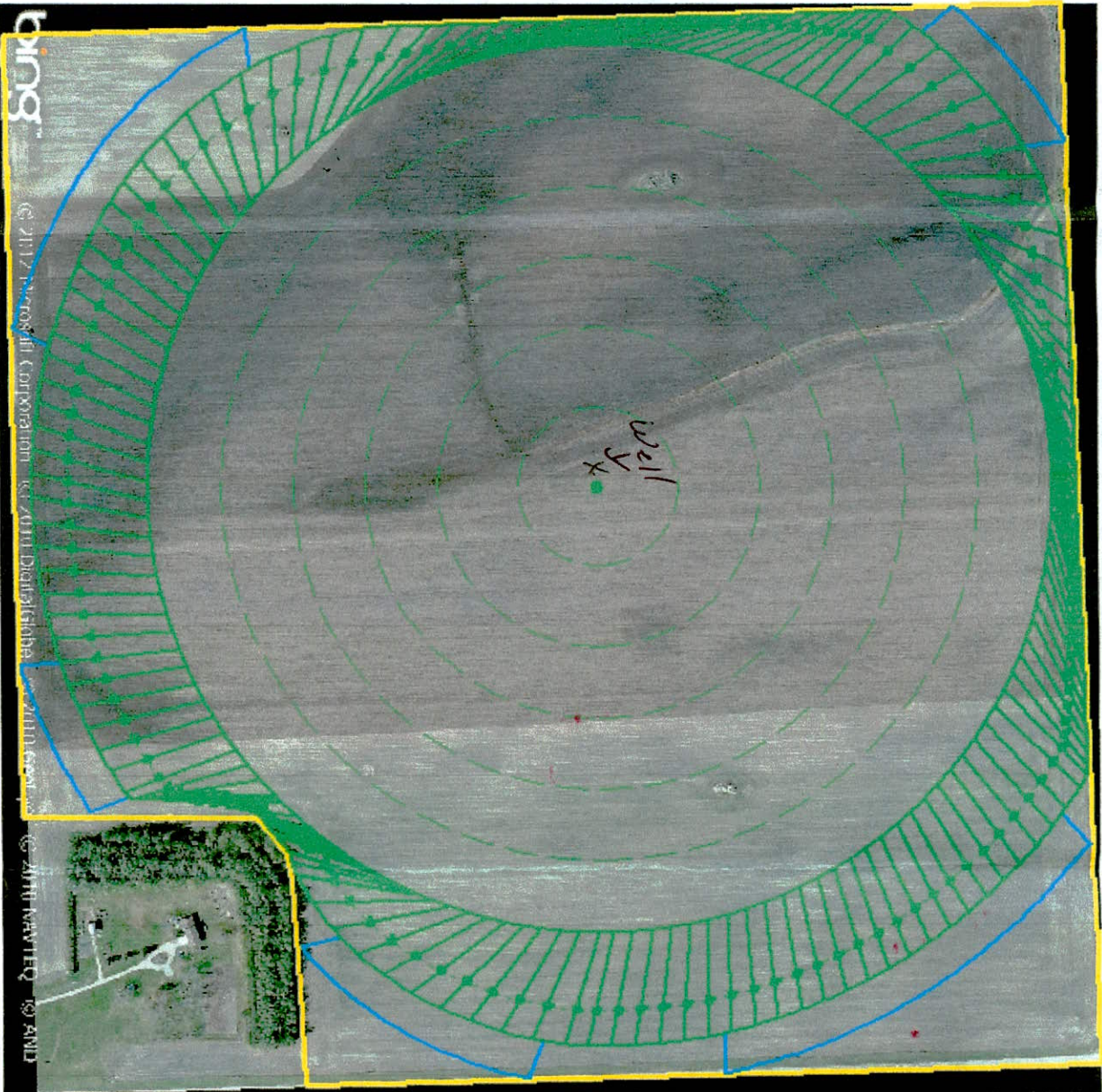
Sec 17
T119N
R47W

Sec 16
T119N
R47W

Sec 15
T119N
R47W



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Lindsay Manufacturing Co. RECEIVED



2707 North 108th Street
Omaha, NE 68164
800 - 829 - 5300 office

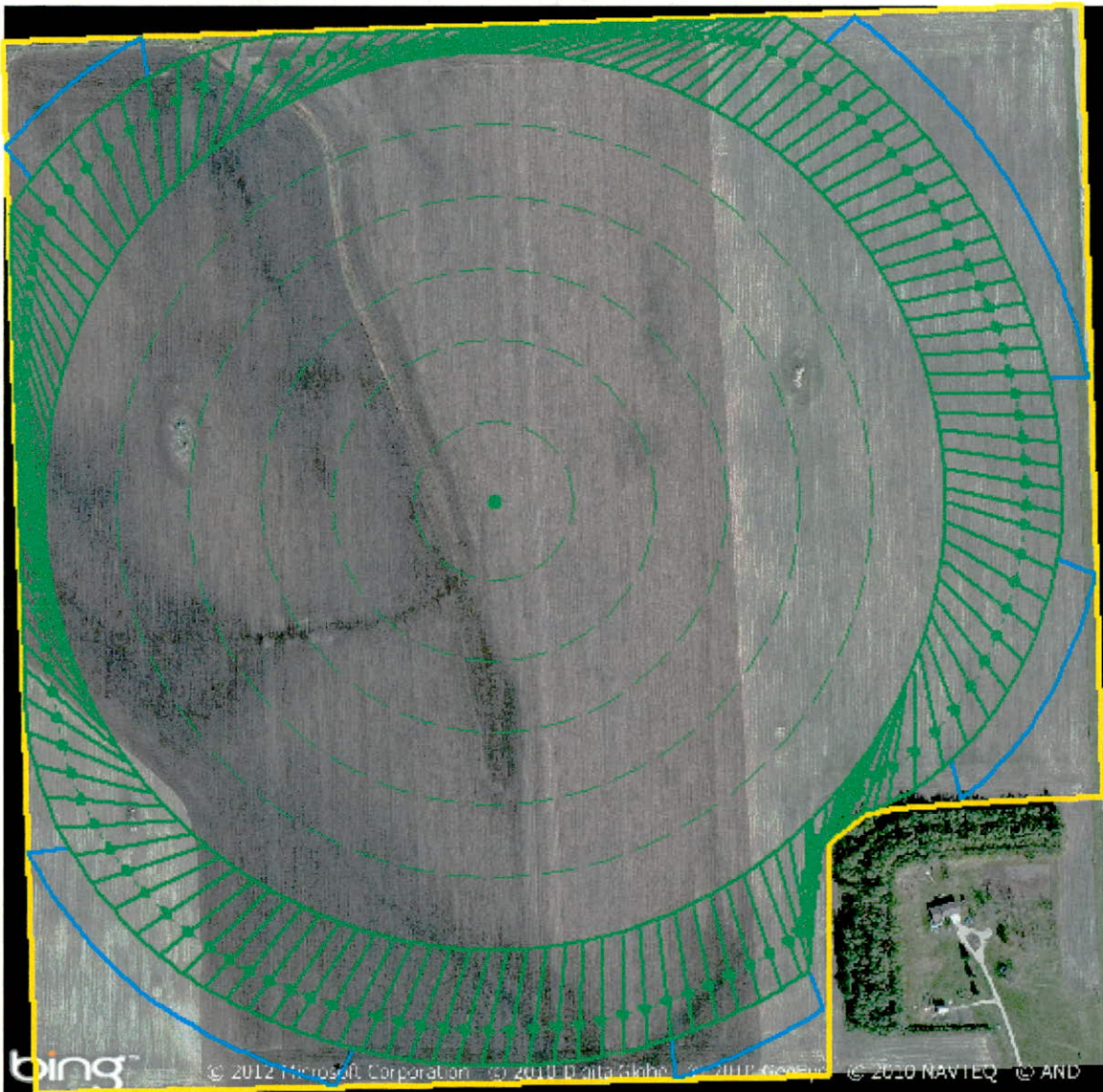
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Farm: Field1

Grower: Roger Schuelke

11/26/2012

Systems:	Length	Spans	Total area including endgun
● Pivot 1	1408.25 ft	6 spans + 201 corner	134.57 acres



SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NW ¼ SE ¼ Sec 9 Twp 119 Rg 47

County Grant

Please mark well
location with an "X"

amended

W

North

E

Well Completion Date

October 23, 2012

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:

mud rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other
 If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	12.00 IN	0.0 FT	168.0 FT	18.00 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Bentonite	55	Lb/gal	0.0 Ft	165.0 Ft
Red Flint	28	Lb/gal	165.0 Ft	188.0 Ft
Describe grouting procedure				
Bentonite	4		188.0	202.0
tremmy				

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 12.00 Inches Length 20.0 Feet
 Material stainless steel
 Slot Size 60 Set From 168.0 Feet to 188.0 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?Lab to which water
quality sample sent for analysis

Well Owner: Roger Schuelke

Business Name:

Address: 2747 11th AVE

City, State, Zip: Marietta MN 56257

WELL LOG:

			DEPTH	
	FORMATION		FROM	TO
top soil	black	M	0	1
sand	brown	M	1	16
clay	blue	M	16	38
sand	wht/M	12slt	38	45
clay	blue	M-sticky	45	168
sand	blue	M	168	188
clay	blue		188	202

STATIC WATER LEVEL

63.0 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: 700 gpm☐ Balled☐ Other

Pumping Level Below Land Surface

147.0 Ft. After 19.5 Hrs. pumped 700.0 GPM

Ft. After Hrs. pumped GPM

If pump installed, pump rate: GPM

REMARKS

N45 97 34.7

96 27 45.1

Kris Van Heuvlen

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MAY - 2 2013

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report is true and accurate.

Drilling firm: Steffl Drilling & Pump Inc

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date:

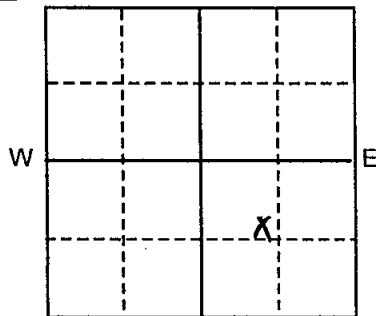
SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NW ¼ SE ¼ Sec 9 Twp 119 Rg 47

County Grant

North

Please mark well
location with an "X"

Well Completion Date

October 23, 2012

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:

mud 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
Quick Grout	8	Lb/gal	0.0 Ft	188.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
Pressure 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: Roger Schuelke

Business Name:

Address: 2747 11th Ave

City, State, Zip: Marrietta MN 56257

WELL LOG:

			DEPTH	
	FORMATION		FROM	TO
Top Soil	Black	M	0	1
Sand	Brown	M	1	16
Clay	Blue	M	16	38
Sand	Wht	M 12slt	38	45
Clay	Blue	M Sticky	45	168
Sand	Gray	M	168	188
Sandy Clay	Blue	M	188	202

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

Test Hole # 1

N 45 07' 34.7"

W 96 27' 45.1"

GPS coordinates
for the well

This well was drilled under license # 463 and this report is true and accurate.

Drilling firm: Steffi Drilling & Pump Inc

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date:

Pivot 1

Pivot Area: **126.98** acres
 Endgun Area: **7.59** acres
 Total Area: **134.57** acres

System Length: **1408.25** ft
 # of Spans: **6 + corner**
 Deg. of Sweep: **360.0°**
 Endgun Throw: **100.0** ft

Color on map:

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Spans

# of Spans: 6	Span 1 (201.3)	Span 2 (401.4)	Span 3 (580.3)	Span 4 (759.3)	Span 5 (938.2)	Span 6 (1117.1)	Corner (1317.3)	Overhang (1411.3)
Length:	201	201	179	179	179	179	201	88 ft
Pipe Size:	6 - 5/8"	6 - 5/8"	6 - 5/8"	6 - 5/8"	6 - 5/8"	6 - 5/8"	6 - 5/8"	5 - 9/16"

Endgun Areas

Endgun 1: (Throw = 100.0 ft)

# of Areas: 5	Start / Stop Angle (Deg. from North)	Start / Stop Angle (Deg. from Pivot Start)	Start / Stop Location (Lat/Long)		Area (acres)
Area 1	34.3° / 76.1°	- NA - / - NA -	45° 7' 45.743" -96° 27' 32.795"	45° 7' 37.370" -96° 27' 25.488"	2.37
Area 2	93.4° / 110.6°	- NA - / - NA -	45° 7' 32.956" -96° 27' 25.396"	45° 7' 28.078" -96° 27' 29.211"	1.34
Area 3	144.9° / 160.5°	- NA - / - NA -	45° 7' 23.034" -96° 27' 34.344"	45° 7' 21.505" -96° 27' 39.146"	0.88
Area 4	193.2° / 225.1°	- NA - / - NA -	45° 7' 21.495" -96° 27' 50.143"	45° 7' 26.639" -96° 27' 59.732"	2.09
Area 5	303.6° / 315.0°	- NA - / - NA -	45° 7' 43.066" -96° 28' 0.262"	45° 7' 45.423" -96° 27' 56.165"	0.91

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date 11/28, 20 12

RECEIVED OF Schuelke Farms 2747 111th Ave Marietta MN 56257

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

Fee for Application for Permit No. <u>7541-3</u> to Appropriate Water, to construct and to put water to beneficial use	850	00
Fee for Application for Permit No. _____ to Appropriate Water for Future use		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. <u>7541-3</u>	200	00
Fee for Filing Transfer Form _____		
Fee for _____		
Fee for Issuing New Well Driller's License No. _____ for C.Y. _____		
Fee for Renewal of Well Driller's License No. _____ for C.Y. _____		
Fee for Issuing Well Pump Installer's License No. _____ for C.Y. _____		
Fee for Renewal of Well Pump Installer's License No. _____ for C.Y. _____		
(Any Other Work Provided by Law)	TOTAL	1050 00

No. **05719**

By *Gene I. Edwards*
Chief Engineer



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov

November 29, 2012

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DEC - 5 2012

WATER RIGHTS
PROGRAM

Roger Schuelke
2747 111th Ave
Marietta MN 56257

Dear Mr. Schuelke:

Thank you for submitting the *Application for a Permit to Appropriate Water* for irrigation in Grant County. In order to complete the application, the following is required.

- Enclosed are copies of the aerial photo maps submitted with the application. The map needs to reference a government section corner or quarter corner including section, township and range. For your use, I have enclosed a map with those designations. Please outline the acreage to be irrigated and mark the proposed well location with an "X".
- On the application, Item No. 2, the total acreage is listed as 150 acres. On Item No. 7, the number of acres is listed at 135 acres. Which is correct?

If you have any questions, please contact me.

Sincerely,

Karen Schlaak

Karen Schlaak
Water Rights Program
605 773-3352
karen.schlaak@state.sd.us

*I own a 150 Acre Parcel
and will irrigate 135 Acres
of it.*

enclosures

Legal Description of the 1/4

9 119 47 SE 1/4 Ex SE 1/4 SE 1/4 SE 1/4 150 Acres

Roger Schuelke

STEFFL DRILLING & PUMP INC.

7-Day 24-Hour Service

February 22, 2013

Ken Buhler
SD DENR-Water Rights Program
Joe Foss Building
523 E Capitol
Pierre, SD 57501-3182

RE: Craig Bass
Hamlin Co, Castlewood Twp, Sec 11

Test Pump Proposal

1. Install piezometer 100 ft south of production well
2. Install piezometer 300 ft east of piezometer #1

Piezometers will intersect the gravel formation and be screened through the formation. Steel protection pipes will be installed on the piezometers with locking covers for security and protection.

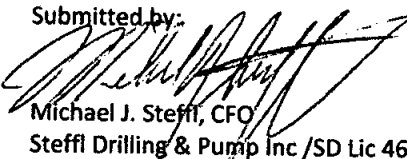
3. Production well will be test pumped for 72 hours.

Pressure transducers will be installed in the production well and both piezometers.

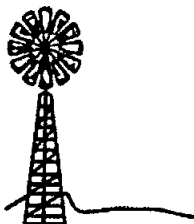
Readings will be taken:

- a) 72 hours prior to test pump start up
- b) during the 72 hours of test pumping
- c) the 72 hours after shut down of the test pump.

Submitted by:


Michael J. Steffl, CFO
Steffl Drilling & Pump Inc /SD Lic 463

cc Roger Schulke



2295 - 66TH Ave N.E. * Willmar, MN 56201-9183
(320) 235-8484 * FAX: (320) 235-4848
Email: steffl@waterwelldrilling.com
www.waterwelldrilling.com

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Schuelke Farms
Roger and Patricia, owners
2747 111th Avenue
Marietta, MN 56257
February 19, 2013

Department of Environment & Natural Resources
ATTN: Ken Buhler
PMB 2020
Joe Foss Building
523 East Capitol
Pierre, SD 57501-3182
Dear Mr. Buhler:

I am corresponding in regards to Permit #7541-3. Staffl Well Drilling is the services we are using for drilling the Aquifer pump test, as your office as requested. The company was scheduled to begin drilling, this week, but because of successive blizzards and snow storms, the drillers were unable to attempt the drilling test. The company has assured us they will begin drilling as soon as the weather permits.

Staffl Well Drilling and I will get the information to you as soon as the pump test has been completed. It may not be possible to get you the information by the March 7th Hearing. Is there any kind of adjustment that we may/can make.

Sincerely,

A handwritten signature in black ink, appearing to read "Roger Schuelke". The signature is fluid and cursive, with the first name "Roger" being more prominent than the last name "Schuelke".

Roger Schuelke

Gronlund, Eric

From: Gronlund, Eric
Sent: Tuesday, February 19, 2013 11:48 AM
To: Buhler, Ken
Subject: Roger Schuelke called - we are recommending deferral of his application

Said with the weather, driller will not make out in time to get aquifer pump test completed. He said the March 7th hearing date is not realistic. He wanted to auto-delay his hearing. I tried to talk him out of that and to allow for deferral and then assuming everything was favorable bring back before the Board at their May 1 – 2 meeting.

He said he already has a pivot order for delivery the end of March. He wanted some assurance by then. I told him that the application would not be brought back before the Board until the May meeting. That if the aquifer pump test and analysis came back favorable, DENR may have a revised recommendation by then but no guarantees.

He also wanted to talk about the aquifer pump test and I told him you were the technical staff on that issue but that my understanding was the test could show that the aquifer is not capable of supplying the needed water or that it may be capable. In the case of the later, it would still be likely that DENR would attach drawdown conditions as part of any recommendation to approve.

Eric



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

denr.sd.gov

March 12, 2013

NOTICE

TO: Roger Schuelke
2747 111th Avenue
Marietta MN 56257

FROM: Garland Erbele, Chief Engineer
Water Rights Program

SUBJECT: Deferral of Water Permit Application No. 7541-3, Roger Schuelke

On March 7, 2013, the Water Management Board deferred consideration of Water Permit Application No. 7541-3 to appropriate groundwater from one well for irrigation in SE ¼ Section 9, T119N, R47W. The deferral is based upon the need for an aquifer pump test to allow evaluation of the potential aquifer including the availability of unappropriated water and potential impacts to existing users from the aquifer. These are criteria set forth in SDCL 46-2A-9 for when a water right permit may be issued. The aquifer pump test shall include an analysis of the test by a qualified engineer or hydrologist.

Please contact Ken Buhler regarding the aquifer pump test requirements or Eric Gronlund if you have questions about the deferral of the application. They can be contacted at (605) 773-3352.

c: Diane Best, Assistant Attorney General

CERTIFICATION

I hereby certify that on March 12, 2013, I have personally deposited with the United States mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated March 12, 2013, regarding deferral of Water Permit Application No. 7541-3, Roger Schuelke, as set forth below:

Roger Schuelke
2747 111th Avenue
Marietta MN 56257

Diane Best, Assistant Attorney General
317 N Main Avenue
Sioux Falls SD 57104



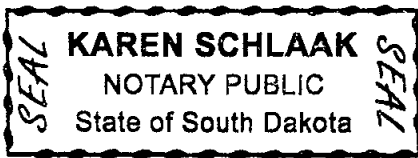
Gail Jacobson
Water Rights Program, DENR

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 12th day of March, 2013



Karen Schlaak
Notary Public
My Commission expires April 1, 2013



3/14/12

Fax To

Dept of Environment.
& Natural Resources.

C/O Ken Butler.
PMB 2020
Joe Foss. Building
523 E Capitol

Pierre SD. 5750~~1~~-3182

Fax # 605-773-4068

From

Roger Schuelke
2742 111th Ave
Marquette Mn 56257
320-668-2532

Subject; Water Analysis for
the Irrigation Water Permit #7541-3



Stearns DHIA Laboratories

MN Lab ID# 027-145-378

825 12th St. So., P O Box 227,
Sauk Centre, MN 56378-0227
320.352.2028 Phone
800.369.2697 Toll Free
320.352.6163 Fax
Email:
stearnsdhialab@stearnsdhialab.com

Report of Analysis

Name: STEFFL DRILLING AND PUMP
2295 66TH AV NE
WILLMAR, MN 56201

Sample ID/Invoice #: 164694
Account #: 003772
Internal ID#: 16662
Sample Type: Water
Client Sample ID: ROGER SCHUELKE
2747 11TH AVE
MARIETTA MN 56257

Report Date: 3/8/2013 3:27:42 PM
Date: 3/8/2013

Sample Date: 3/1/2013 2:10 PM
Sampler: MIKE S.
Receipt Date: 3/4/2013 8:00 AM
Receipt Temp: 2°C

Analyte	Approved Method	Analysis Date/Time	Analyst	Sample Result	Units
Nitrate Nitrogen	SM 4500-NO3- F-00 (calc)	3/05/2013 12:25	mmm	<0.047	mg/L
Calcium	EPA 200.7 Rev. 4.4	3/07/2013 11:02	llp	80.48	mg/L
Magnesium	EPA 200.7 Rev. 4.4	3/07/2013 11:02	llp	26.42	mg/L
Sodium	EPA 200.7 Rev. 4.4	3/07/2013 11:02	llp	416.04	mg/L
Potassium	EPA 200.7 Rev. 4.4	3/07/2013 11:02	llp	11.97	mg/L
Iron	EPA 200.7 Rev. 4.4	3/07/2013 11:02	llp	0.80	mg/L
Manganese	EPA 200.7 Rev. 4.4	3/07/2013 11:02	llp	0.06	mg/L
Copper	EPA 200.7 Rev. 4.4	3/07/2013 11:02	llp	0.03	mg/L
Zinc	EPA 200.7 Rev. 4.4	3/07/2013 11:02	llp	0.227	mg/L
Hardness, gr/gallon	Calculation	3/07/2013 15:38	llp	18.200	gr/gallons
Hardness, ppm	Calculation	3/07/2013 15:38	llp	311.300	ppm
Chloride	SM 4500-Cl- E-97	3/06/2013 08:39	llp	254	ppm
Sulfate	ASTM D516-02	3/06/2013 14:28	mmm	734	mg/L
pH	EPA 150.1, uncertified	3/05/2013 10:27	mmm	7.47	SU
Conductance, Specific	SM 2510 B-97	3/05/2013 14:34	mmm	2.78	mmhos/cm
Phosphorous, Total	EPA 365.1 Rev. 2.0	3/07/2013 14:07	mmm	<0.012	mg/L
Nitrogen, Ammonia	EPA 350.1	3/08/2013 14:08	mmm	1.98	mg/L
Solids, Total Dissolved	USGS I-1750-85	3/07/2013 15:46	MMM	1580.0	mg/L

--This report format is not certified by the Minnesota Department of Health. If a certified format is needed, please contact the laboratory.

Comments:

Report Approved by

Laurie Peterson, Lab Tech

Note: The results listed within the report relate only to the sample received on the dates indicated. We do not accept any liability for use of these results. This report must not be reproduced, except in full, without the written approval from Stearns DHIA Laboratories.

LEGGETTE, BRASHEARS & GRAHAM, INC.

PROFESSIONAL GROUND-WATER AND ENVIRONMENTAL ENGINEERING SERVICES

8 PINE TREE DRIVE
SUITE 250
ST. PAUL, MN 55112
(651) 490-1405
FAX (651) 490-1006
www.lbgweb.com

March 22, 2013

Mike Steffl
Steffl Drilling & Pump, Inc.
2295 - 66th Avenue N.E.
Willmar, MN 56201-9183

Re: **Aquifer Pumping Test Results**
Robert Schuelke Irrigation Well
DENR Water Permit Application No. 7541-3
NW ¼ SE ¼, Section 9, T119N-R47W
Grant County, Milbank, South Dakota

Dear Mike:

This letter report presents the results of the 3-day aquifer pumping test (Test) that was completed on the newly installed irrigation well located on above referenced property (Site). The location of the Site and configuration of the irrigation well and two observation wells (Obs-1 and Obs-2) are shown on Figure 1. The Test was required by the Chief Engineer of the Water Rights Program, South Dakota Department of Environment and Natural Resources (DENR) as a part of the water appropriation permitting process for the irrigation well. DENR's Chief Engineer recommended the above permit application be deferred until the Test was completed. The findings from DENR's review are presented in the "Report to the Chief Engineer" (Report) dated January 25, 2013, which was included in the Chief Engineer's February 8, 2013 letter.

Leggette, Brashears & Graham, Inc (LBG) assisted Steffl Drilling and Pump, Inc. (Steffl) by instrumenting the wells with pressure transducers and data loggers (loggers), downloading data from the loggers, and completing the analysis and evaluation of the results. Steffl installed and developed the wells, and provided the pump, electrical power, flow meter, and discharge pipe.

OBJECTIVES AND TASKS

The objective of the Test as outlined in our February 15, 2013 scope of work was to determine the aquifer parameters (transmissivity and storativity) using standard analytical methods, identify any negative boundary conditions that could affect the sustainability of the aquifer being pumped, and assess the potential impact to other users. To help meet these objectives, the following activities were completed by LBG:

- Installed and programmed loggers in the irrigation well and Obs-1 and Obs-2;
- Conducted site visits 3 days prior to pumping and 3 days after pumping stopped;

- Downloaded data from the loggers and collected manual water level measurements from the irrigation well and observation wells during site visits; and,
- Analyzed the data and reported the results.

BACKGROUND

Hydrogeology

The Site and surrounding area has two aquifers, referenced in the DENR's Report as the glacial "Veblen aquifer" and the underlying basal Granite wash aquifer. The irrigation well and the observation wells are completed in the Granite wash aquifer.

The "Veblen aquifer" consists of buried outwash sands and gravels that are mostly under confined conditions. Well logs from the Site show the "Veblen aquifer" is encountered at depths ranging from approximately 20 to 40 feet below grade (ft bg) and has a thickness ranging from approximately 7 to 20 feet. DENR's Report indicates the average static water level in the "Veblen aquifer" is approximately 30 ft bg across the region. This aquifer is underlain by approximately 120 to 130 feet of glacial till that separates it from the deeper Granite wash aquifer.

The Granite wash is an uncemented sand layer that in direct contact with the underlying Precambrian granite. This aquifer is found at a depth of approximately 165 ft bg at the Site and is approximately 20 feet thick. The static water level in the irrigation well was approximately 60 ft bg at the start of the Test.

Pumping and Observation Well Network

The irrigation well was installed on October 23, 2012 by Steffl. The well is screened in the Granite wash from 168 to 188 ft bg. Steffl also installed the two observation wells in the same aquifer. Wells Obs-1 and Obs-2 are located 207 feet west and 1,416 feet south of the irrigator, respectively (Figure 1). The well logs are in Attachment 1.

TEST PROCEDURES

Test Procedures

As is mentioned in DENR's letter a final determination on the approval of the water appropriation cannot be determined until a pumping test is completed and the results evaluated. To meet this requirement, the Test was conducted over an approximate 9 day period (3-days of pre-pumping, 3-days of pumping, and 3-days of recovery). The irrigation well was pumped at a rate of 700 gallons per minute (gpm). The monitoring periods are summarized below.

Test Period	Start Date and Time	End Date and Time	Period Duration
Pre-pumping	2/26/2013 13:53	03/01/2013 13:34	2.9 days
Pumping	03/01/2013 13:34	03/04/13 13:44	3.0 days
Recovery	03/04/2013 13:44	03/08/2013 10:23	3.8 days

Groundwater level data from the irrigator and observation wells were collected using loggers,

and manually with an electronic water level meter during installation and removal of the equipment. A discharge hose was installed that diverted water to a tile drain 200 feet away from the wellhead.

RESULTS AND DISCUSSION

Qualitative Analysis

A qualitative analysis was completed by evaluating the groundwater level response in the three wells monitored. Depth to groundwater and drawdown over time graphs are in Attachment 2. Natural background conditions, aquifer boundary conditions, and other potential high-capacity pumping during the Test were considered. A summary of each well is presented below.

Irrigation Well

- The water level fluctuations that occurred during the pre-pumping period resulted from the transducer being temporarily removed while the pump was installed.
- The water level response observed during the pumping and recovery periods is consistent with a confined aquifer.
- No recharge or negative boundary conditions were observed.
- Approximately 85 feet of drawdown was measured at the end of the 3-day pumping period.
- The water level at the end of pumping was 23 feet above the top of the aquifer.
- 3.8 days after pumping stopped, the water level recovered to within 95 percent of the pre-pumping level.
- Assuming a worst case scenario, if the well were pumped continuously at 700 gpm for 90 days the water level would remain above the top of the aquifer if it continued to follow the trend observed during the Test.

Obs-1

- No significant fluctuations in the water levels occurred during the pre-pumping period.
- The water level response observed during the pumping and recovery periods is consistent with the irrigation well.
- No recharge or negative boundary conditions were observed.
- Approximately 34 feet of drawdown was measured at the end of the 3-day pumping period.
- The water level at the end of pumping was approximately 70 feet above the top of the aquifer.
- The water level recovered to within 88 percent of the pre-pumping condition 3.8 days after pumping stopped.
- Theoretically the long -term projected water level will remain a safe distance above the top of the aquifer assuming the same trend observed over the 3-day pumping period continues.

Obs-2

- No significant fluctuations in the water levels occurred during the pre-pumping period.
- The water level response observed during the pumping and recovery periods is consistent with the irrigation well and Obs-1 response.
- No recharge or negative boundary conditions were observed.
- Approximately 21 feet of drawdown was measured at the end of the 3-day pumping period.

- The water level at the end of pumping was approximately 80 feet above the top of the aquifer.
- The water level recovered to within 80 percent of the pre-pumping condition 3.8 days after pumping stopped.

Quantitative Analysis

The Theis (1935) and Cooper-Jacob (1946) solutions for a confined aquifer were used to determine aquifer parameters. The transmissivity (T) ranged from approximately 2,450 to 3,395 square feet per day (ft²/day) and averaged 2,950 ft²/day. Storativity (S) ranged from 4.3E-05 to 6.9E-05 and averaged 5.5E-05. The results are listed in Table 1 and the analyses in Attachment 3.

SUMMARY AND CONCLUSIONS

The Test was completed to meet the DENR's request for further evaluation of the Granite wash aquifer that supplies the irrigation well at the above referenced Site. To meet the DENR's requirements, the Test was completed to identify potential negative impacts, if any, on the aquifer or other users as a result of the irrigation well pumping approximately 700 gpm. Based on the results of the Test the following conclusions can be made:

- The water level response observed from the Test is consistent with a confined aquifer;
- Negative boundary conditions were not observed during the 3-day pumping period; therefore the data observed during the Test can be used to estimate the aquifer parameters and theoretically project future water trends in the irrigation well and observation wells;
- Based on the observed water level response and theoretical water level projections the irrigation well can sustain a 700 gpm rate without adversely impacting the aquifer;
- The till unit that separates the Granite wash aquifer from "Veblen aquifer" likely minimizes the hydraulic connection between the two aquifers in the area of the Site; therefore, no adverse impacts are anticipated in the shallower "Veblen aquifer" as a result of the proposed pumping.
- Based on the results of the Test, a sufficient amount of available head will remain above the top of the Granite wash aquifer in the area of the Site; therefore, the potential for adverse impact to the aquifer other users is minimal.

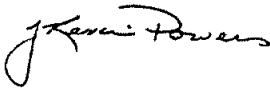
If you have any questions regarding this information, please contact me at (651) 558-9207.

LEGGETTE, BRASHEARS & GRAHAM, INC.

A handwritten signature in black ink, appearing to read "D. Hume", with a stylized flourish at the end.

David S. Hume
Senior Associate

Reviewed by:

A handwritten signature in black ink, appearing to read "J. Kevin Powers", with a stylized flourish at the end.

J. Kevin Powers
Senior Vice President

DSH
Attachments

REFERENCES

- Theis, C.V., 1935. The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwater storage, *Am. Geophys. Union Trans.*, vol. 16, pp. 519-524.
- Cooper, H.H. and C.E. Jacob, 1946. A generalized graphical method for evaluating formation constants and summarizing well field history, *Am. Geophys. Union Trans.*, vol. 27, pp. 526-534.
- Report to the Chief Engineer, Water Permit Application No. 7541-3, Roger Schuelek, January 25, 2013, prepared by SD DENR – Water Rights Program.

Table 1

Summary of Aquifer Parameters
Schuelke 3-Day Pumping Test
Milbank, SD

Pumping Well	Pumping Well Screened Interval	Test	Observation Well	Observation Well Screened Interval (ft bg)	Distance to Pumping Well (ft)	Aquifer Thickness (ft)	Transmissivity (ft²/day)	Hydraulic Conductivity	Storativity	Solution				
Schuelke Irrigator	168-188	Constant Rate at 700 gpm	Schuelke Irrigator	168-188	0.5	20	3,346	167	NA	Theis				
							3,394	170	NA	Copper-Jacob				
			Obs-1	165-185	207		2,938	147	4.3E-05	Theis				
							2,938	147	4.3E-05	Copper-Jacob				
			Obs-2	159-179	1416		2,637	132	6.3E-05	Theis				
							2,449	122	6.9E-05	Copper-Jacob				
									Average	2,950	148	5.5E-05		
									Geomean	2,930	147	5.3E-05		
									Min	2,449	122	4.3E-05		
									Max	3,394	170	6.9E-05		

G:\GIS\Steffl\Schuelke\maps\g3stefflschulk01a.mxd, 3/22/2013, 11:16:53 AM, NAD 1983 UTM Zone 14N



⊕ Well Location

Source: ESRI Online Imagery, Digital Globe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community.



Prepared By:
LEGGETTE, BRASHEARS & GRAHAM, INC.
Professional Groundwater and
Environmental Engineering Services
8 Pine Tree Drive, Suite 250
St. Paul, Minnesota 55112
(651) 490-1405

STEFFL DRILLING & PUMP INCORPORATED
MILBANK, SOUTH DAKOTA

SITE FEATURES
SCHUELKE PRODUCTION WELL 3-DAY TEST

FILE: g3stefflschulk01a.MXD

DATE: 3/19/2013

FIGURE: 1

ATTACHMENT 1

WELL LOGS

Production
Irrigation well

SD EForm - 1621LD V1

11-02

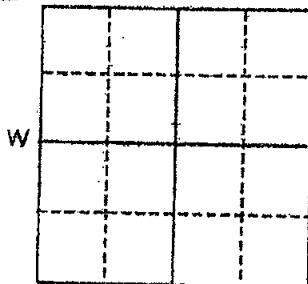
SOUTH DAKOTA WATER WELL COMPLETION REPORT

Location NW ¼ SE ¼ Sec 9 Twp 119 Rg 47

County Grant

North

Please mark well
location with an "X"



Well Completion Date

October 23, 2012

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:

mud rotary

CASING DATA:

If other describe ☐ Steel ☒ Plastic ☐ Other

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	12.00 IN	0.0 FT	168.0 FT	18.00 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Red Flint #60	30	Lb/gal	153.0 Ft	188.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
Tremmy

SCREEN:

☐ Perforated pipe ☒ Manufactured
Diameter 12.00 Inches Length 20.0 Feet

Material stainless steel

Slot Size 60 Set From 168.0 Feet to 188.0 Feet

Other information

WAS A PACKER OR SEAL USED?

If so, what material? ☐ Yes ☒ No

Describe packer(s) and location

DISINFECTION:

Was well disinfected upon completion?

☒ Yes, How? chlorine

☐ No, Why Not?

Lab to which water
quality sample sent for analysis

Well Owner: Roger Schuelke

Business Name:

Address: 2747 11th AVE

City, State, Zip: Marietta MN 56257

WELL LOG:

			DEPTH	
			FROM	TO
top soil	black	M	0	1
sand	brown	M	1	16
clay	blue	M	16	38
sand	wht/M	12slt	38	45
clay	blue	M-sticky	45	168
sand	blue	M	168	188
clay	blue		188	202

b = 20'

STATIC WATER LEVEL 63.0 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: 700 gpm

☐ Bailed

☐ Other

Pumping Level Below Land Surface

147.0 Ft. After 19.5 Hrs. pumped 700.0 GPM

Ft. After Hrs. pumped GPM

If pump installed, pump rate: GPM

REMARKS

N45 97 34.7

96 27 45.1

Kris Van Heuveln

This well was drilled under license # 463 and this
report is true and accurate.

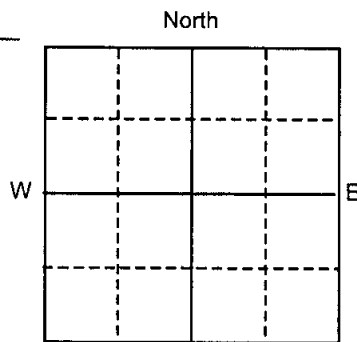
Drilling firm: Steffi Drilling & Pump Inc

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location 1/4 1/4 Sec 9 Twp 119N Rg 47WCounty GrantPlease mark well
location with an "X"

Well Completion Date

Feb 22, 2013

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:

mud rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	2.00 IN	0.0 FT	195.0 FT	4.75 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
HS Bent	6	Lb/gal	0.0 Ft	155.0 Ft
R Flint	6	Lb/gal	155.0 Ft	195.0 Ft

Describe grouting procedure
Tremmy

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 2.00 Inches Length 20.0 Feet
 Material plastic
 Slot Size 25 Set From 165.0 Feet to 185.0 Feet
 Other information Inline

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: Roger Schuelke

Business Name: _____

Address: 2747 11th AVECity, State, Zip: Marietta MN 56257

WELL LOG:

			DEPTH	
FORMATION			FROM	TO
top soil	black	M	0	1
clay	tan	M	1	20
clay	sand/streaks	M	20	38
clay	gray	gummy	38	165
sandstone	wht/blu	18slt	165	185
clay	gray	gummy	185	195

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: air
☐ Bailed
☐ Other

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

Piez No 1(north)
45 07 34.7N
096 27 48.1W
This well was drilled under license # 463 and this report is true and accurate.Drilling firm: Steffl Drilling & Pump Inc

Signature of License Representative: _____

Signature of Well Owner or Equitable Property Holder: _____

Date: _____

SOUTH DAKOTA WATER WELL COMPLETION REPORT

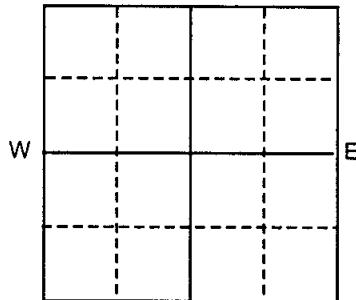
11-02

Location SE ¼ SE ¼ Sec 9 Twp 119N Rg 47WWell Owner: Roger Schuelke

Business Name: _____

Address: 2747 11th AVECity, State, Zip: Marietta MN 56257County Grant

North

Please mark well
location with an "X"

Well Completion Date

Feb 22, 2013

1 Mile

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

PROPOSED USE:

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

METHOD OF DRILLING:

mud rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
_____ LB/FT	<u>2.00</u> IN	<u>0.0</u> FT	<u>189.0</u> FT	<u>4.75</u> IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
<u>HS Bent</u>	<u>6</u>	<u>Lb/gal</u>	<u>0.0</u> Ft	<u>149.0</u> Ft
<u>R Flint</u>	<u>6</u>	<u>Lb/gal</u>	<u>149.0</u> Ft	<u>189.0</u> Ft

 Describe grouting procedure
Tremmy

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 2.00 Inches Length 20.0 Feet
 Material plastic
 Slot Size 25 Set From 159.0 Feet to 179.0 Feet
 Other information Inline

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? granular
☐ No, Why Not? _____

 Lab to which water
 quality sample sent for analysis

WELL LOG:

			DEPTH	
FORMATION			FROM	TO
top soil	black	M	0	1
clay	tan	M	1	20
sand	gray	M	20	30
clay	gray	gummy	30	163
sandstone	wht/blu	18slt	163	179
clay	blue	gummy	179	189

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: air
☐ Bailed
☐ Other

Pumping Level Below Land Surface

_____ Ft. After _____ Hrs. pumped _____ GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

Piez No 2(south)
45 07 20.5N
096 27 45.2W

 This well was drilled under license # 463 and this
 report is true and accurate.
Drilling firm: Steffl Drilling & Pump Inc

Signature of License Representative: _____

Signature of Well Owner or Equitable Property Holder: _____

Date: _____

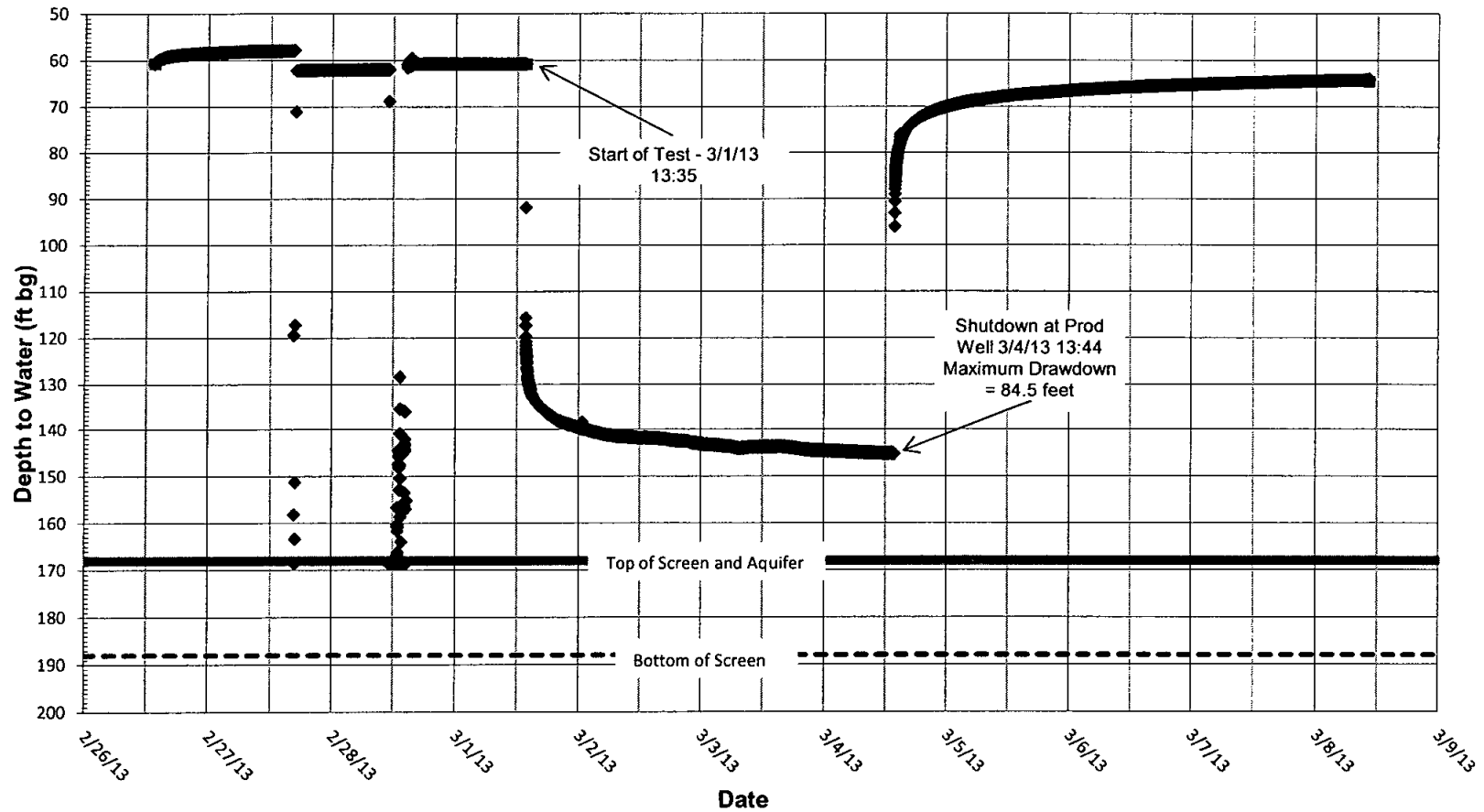
ATTACHMENT 2
QUALITATIVE ANALYSIS

**Irrigation Well
Depth to Water vs Time (linear)
3-Day Schuelke Test**

Milbank, SD

◆ Transducer Measurement

■ Manual Measurement

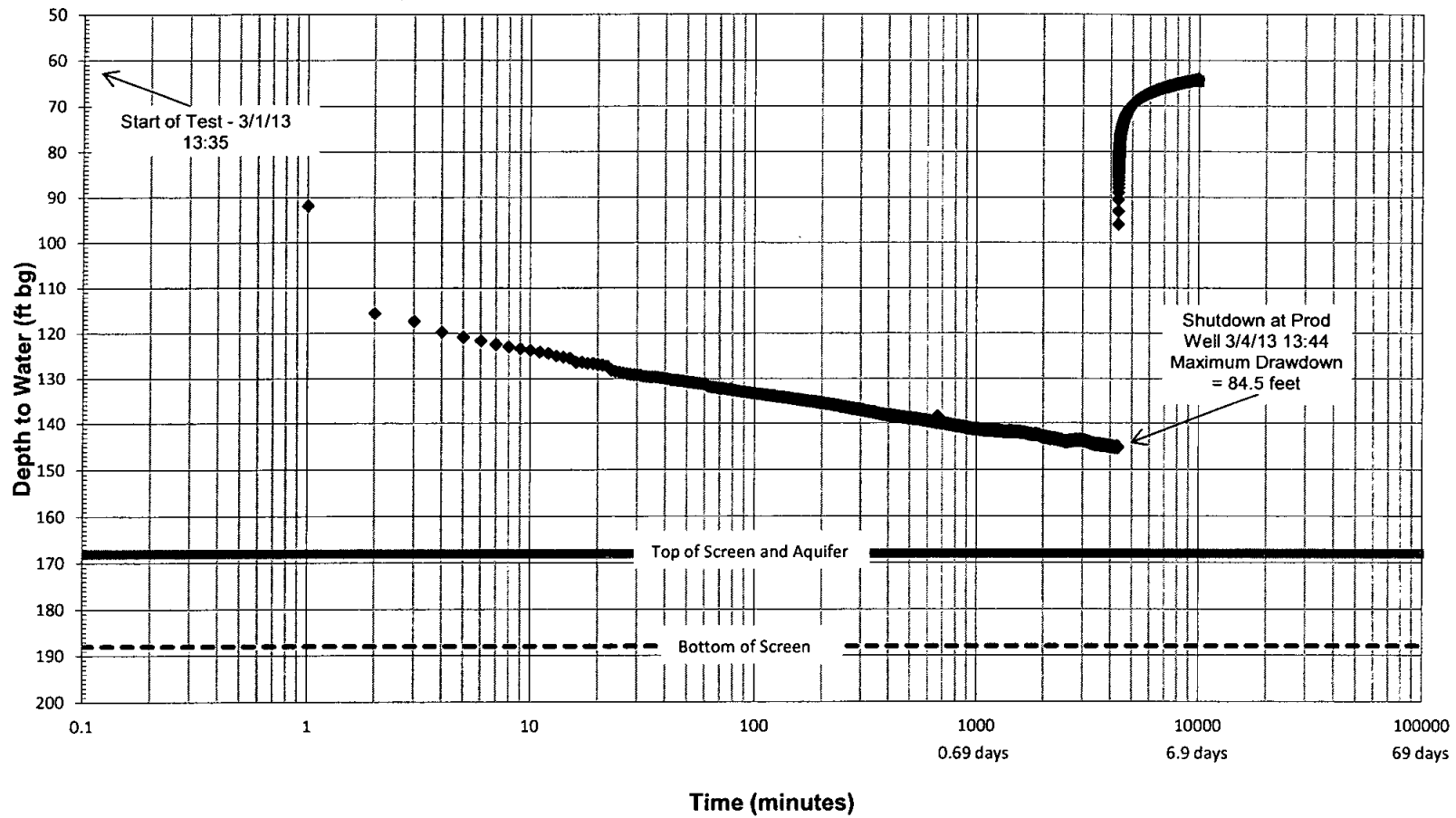


**Irrigation Well
Depth to Water vs Time (semi-log)
3-Day Schuelke Test**

Milbank, SD

◆ Transducer Measurement

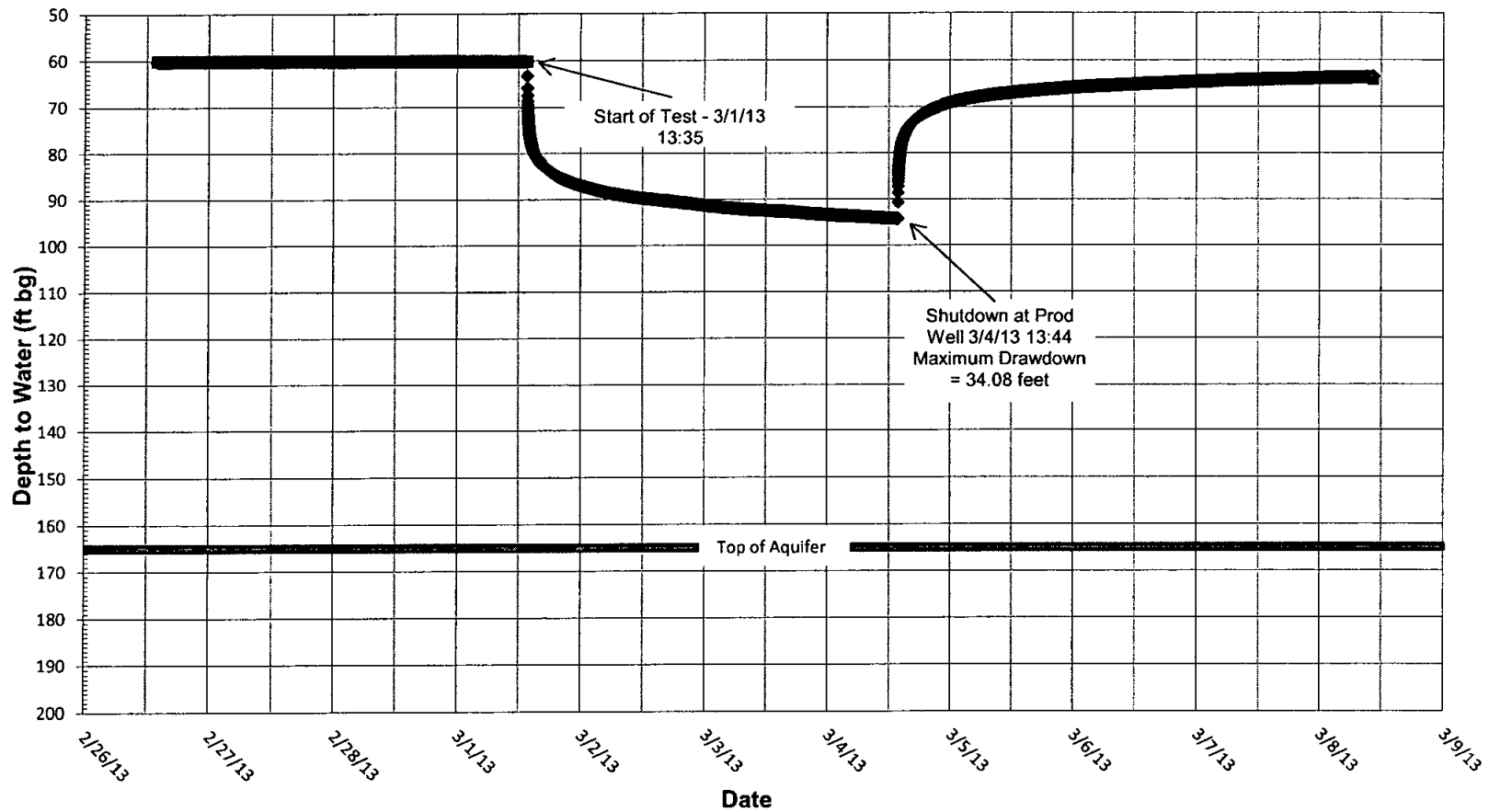
■ Manual Measurement



Obs-1
Depth to Water vs Time (linear)
3-Day Schuelke Test

Milbank, SD

◆ Transducer Measurement
■ Manual Measurement

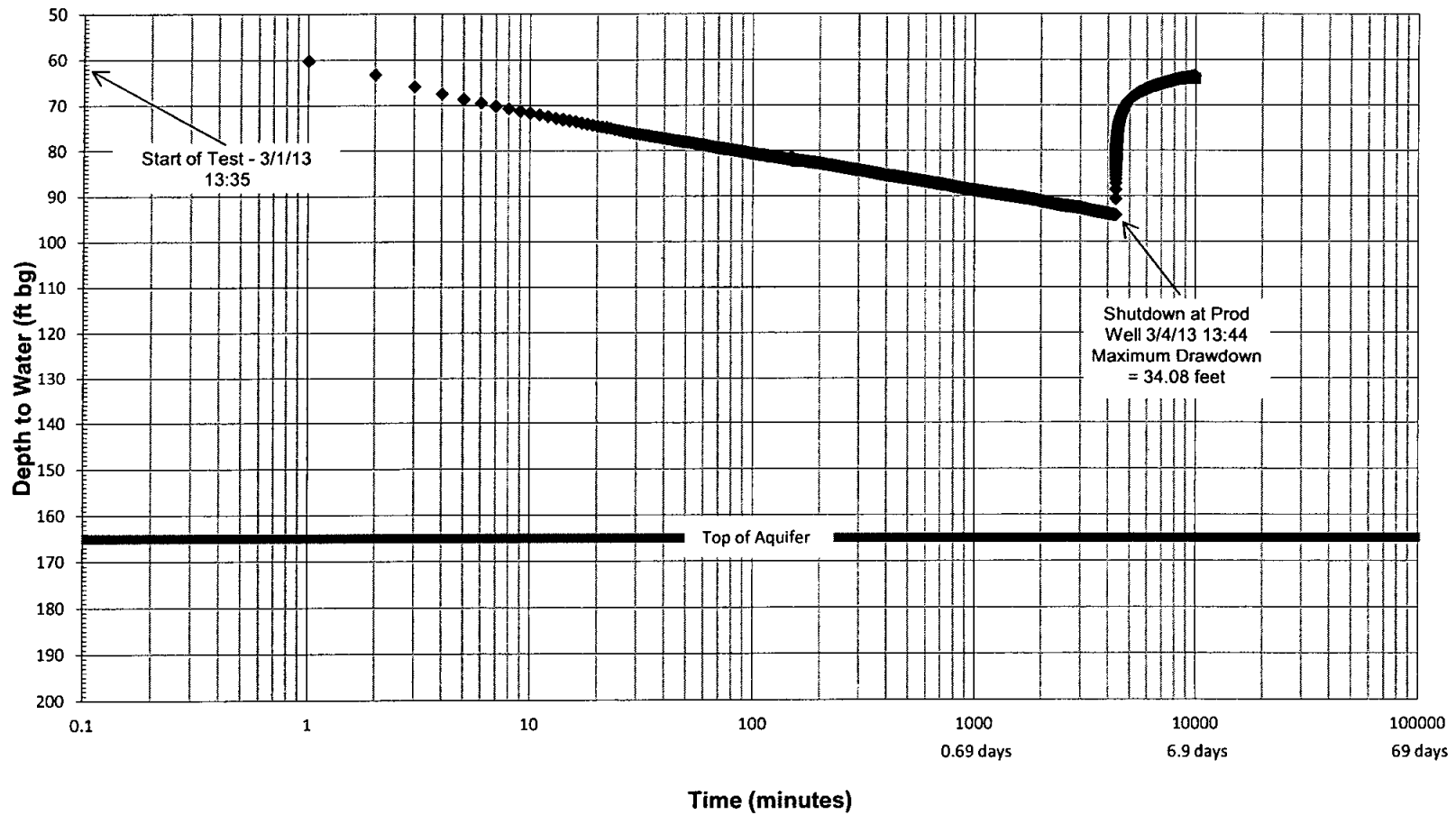


**Obs-1
Depth to Water vs Time (semi-log)
3-Day Schuelke Test**

Milbank, SD

◆ Transducer Measurement

■ Manual Measurement

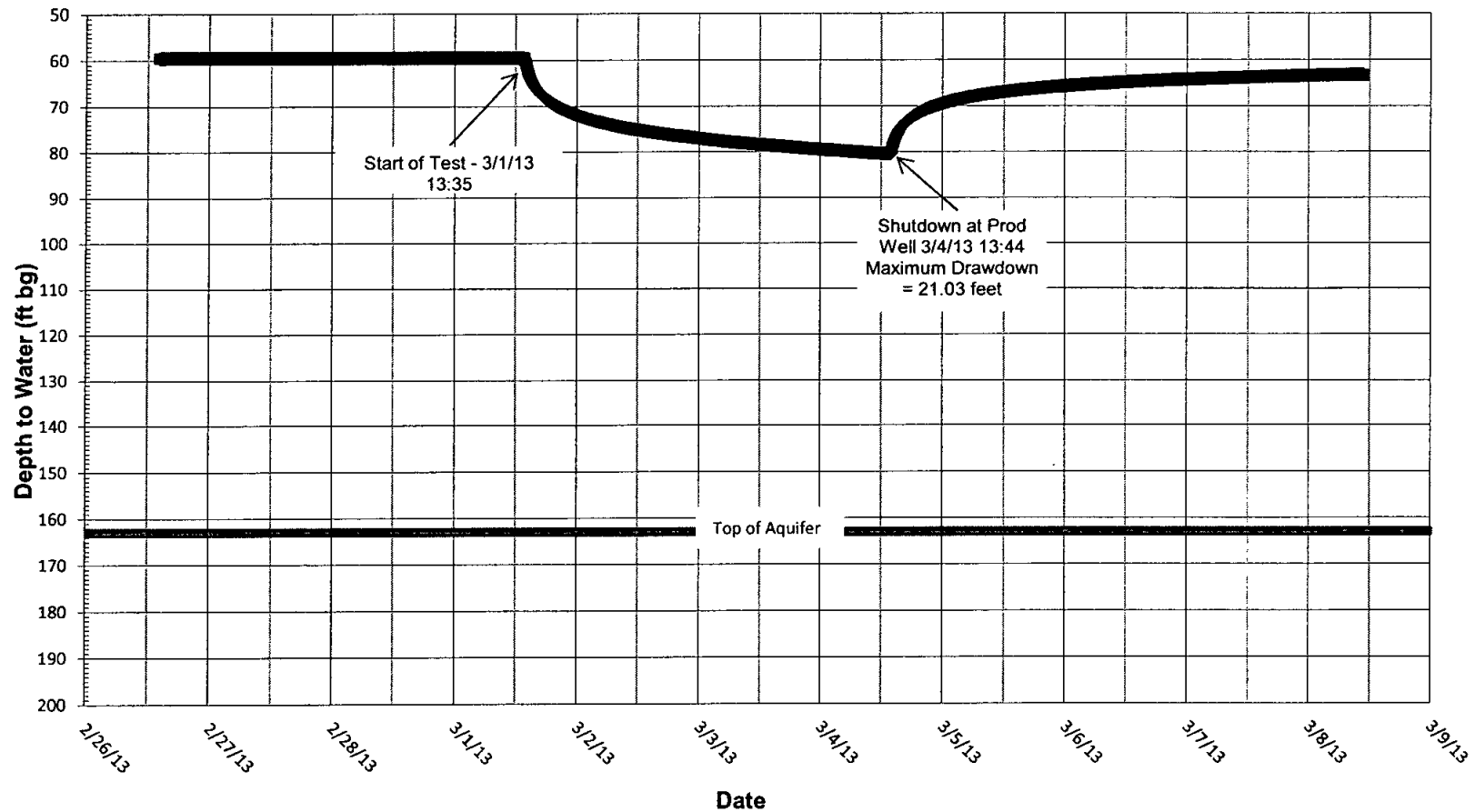


**Obs-2
Depth to Water vs Time (linear)
3-Day Schuelke Test**

Milbank, SD

◆ Transducer Measurement

■ Manual Measurement

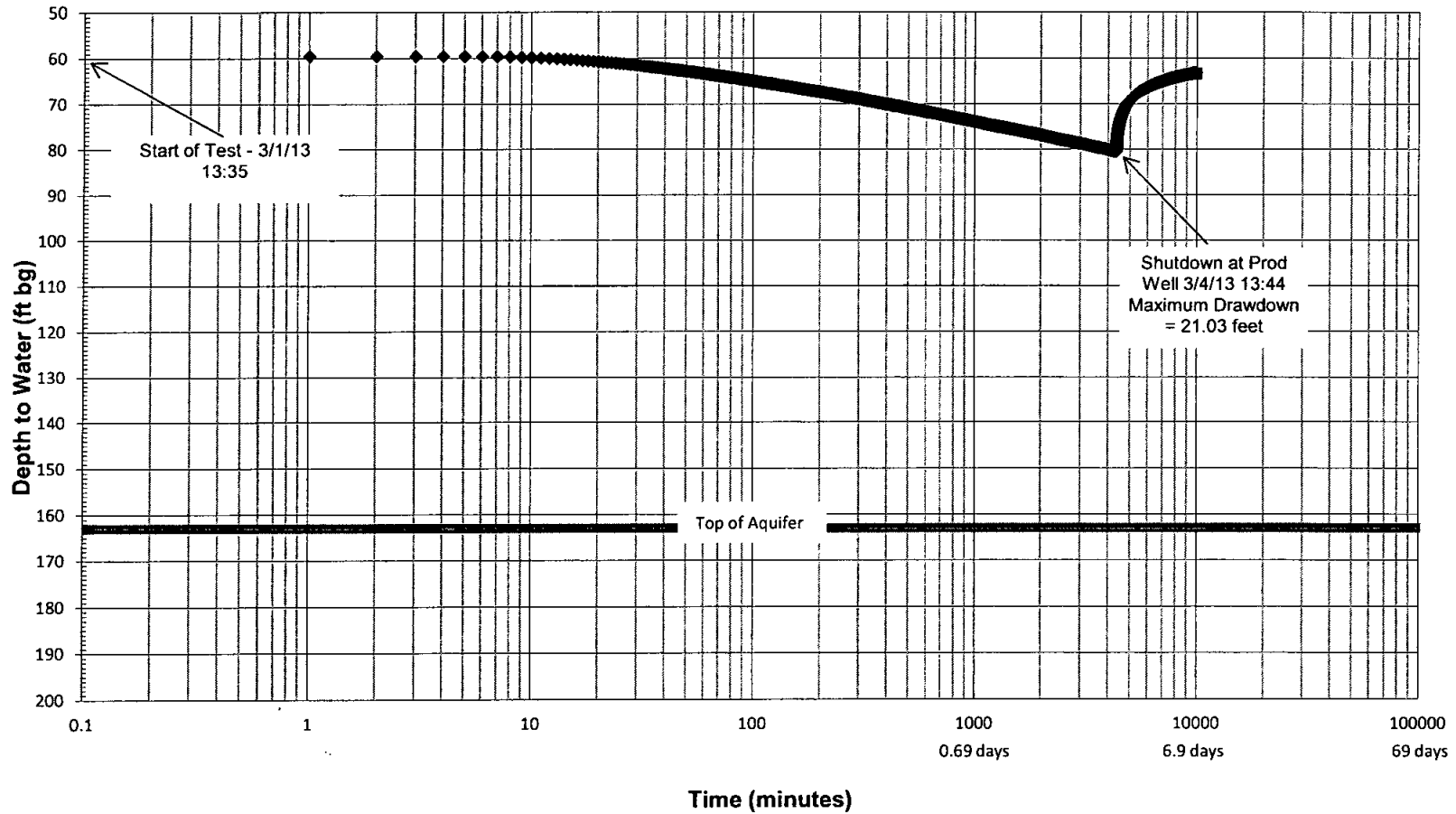


**Obs-2
Depth to Water vs Time (semi-log)
3-Day Schuelke Test**

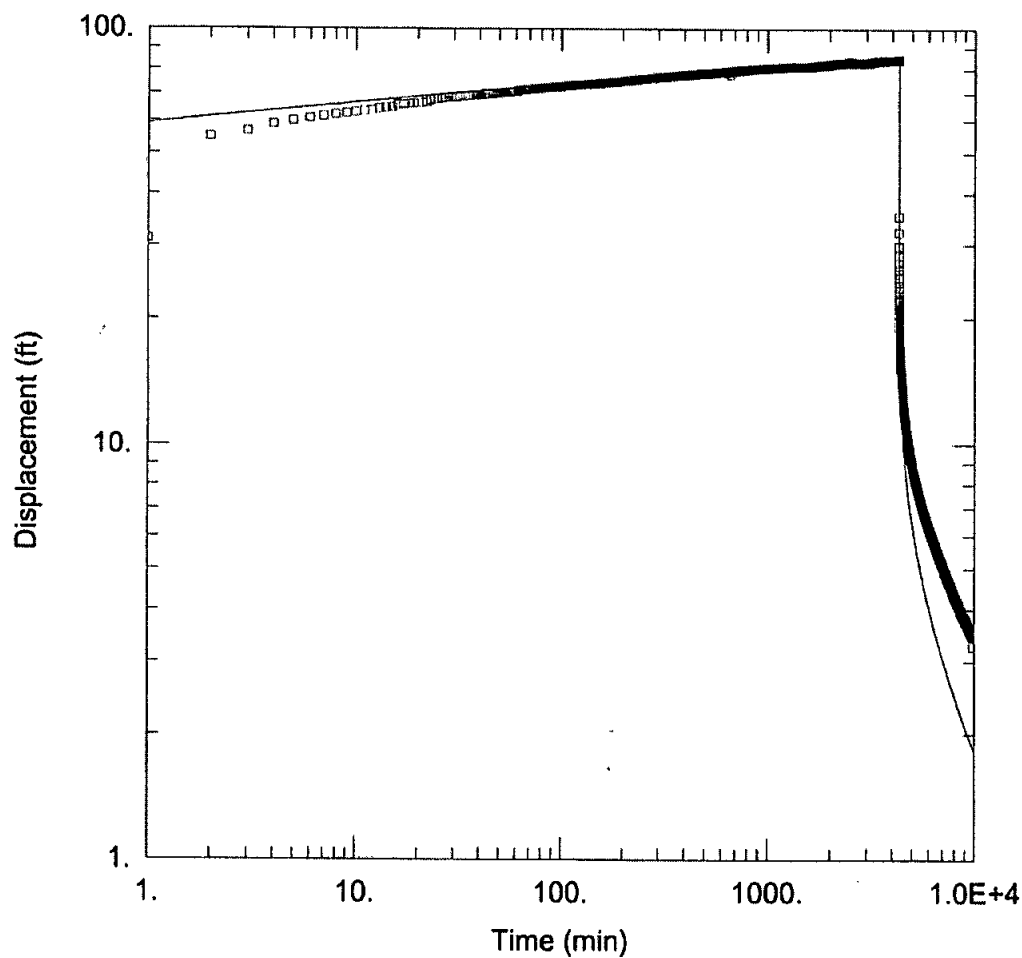
Milbank, SD

◆ Transducer Measurement

■ Manual Measurement



ATTACHMENT 3
QUANTITATIVE ANALYSIS



3-DAY PUMPING TEST

Data Set: S:\Tech\Steffl - Schuelke\AqtSOLV\Irrigator (theis).agt

Date: 03/20/13

Time: 15:44:49

PROJECT INFORMATION

Company: LBG

Client: Steffl Drilling

Location: Millbank, SD

Test Well: Schuelke Irrigator

Test Date: 03-01-13

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Irrigator	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
□ Irrigator	0	0

SOLUTION

Aquifer Model: Confined

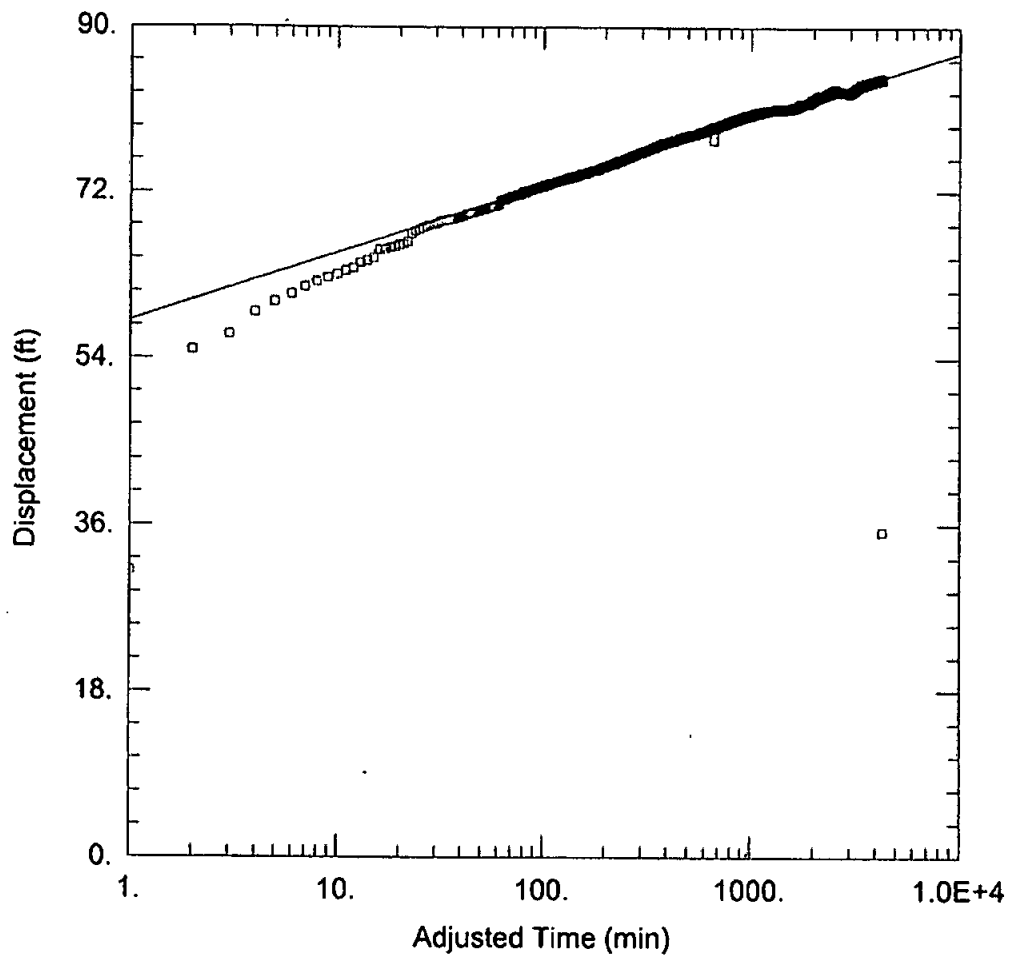
Solution Method: Theis

$T = 3346.1 \text{ ft}^2/\text{day}$

$S = 9.071\text{E-}8$

$Kz/Kr = 1.$

$b = 20. \text{ ft}$



3-DAY PUMPING TEST

Data Set: S:\Tech\Steffl - Schuelke\AqtSOLV\Irrigator (C-J).aqt

Date: 03/20/13

Time: 15:45:10

PROJECT INFORMATION

Company: LBG

Client: Steffl Drilling

Location: Millbank, SD

Test Well: Schuelke Irrigator

Test Date: 03-01-13

AQUIFER DATA

Saturated Thickness: 20. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Irrigator	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
□ Irrigator	0	0

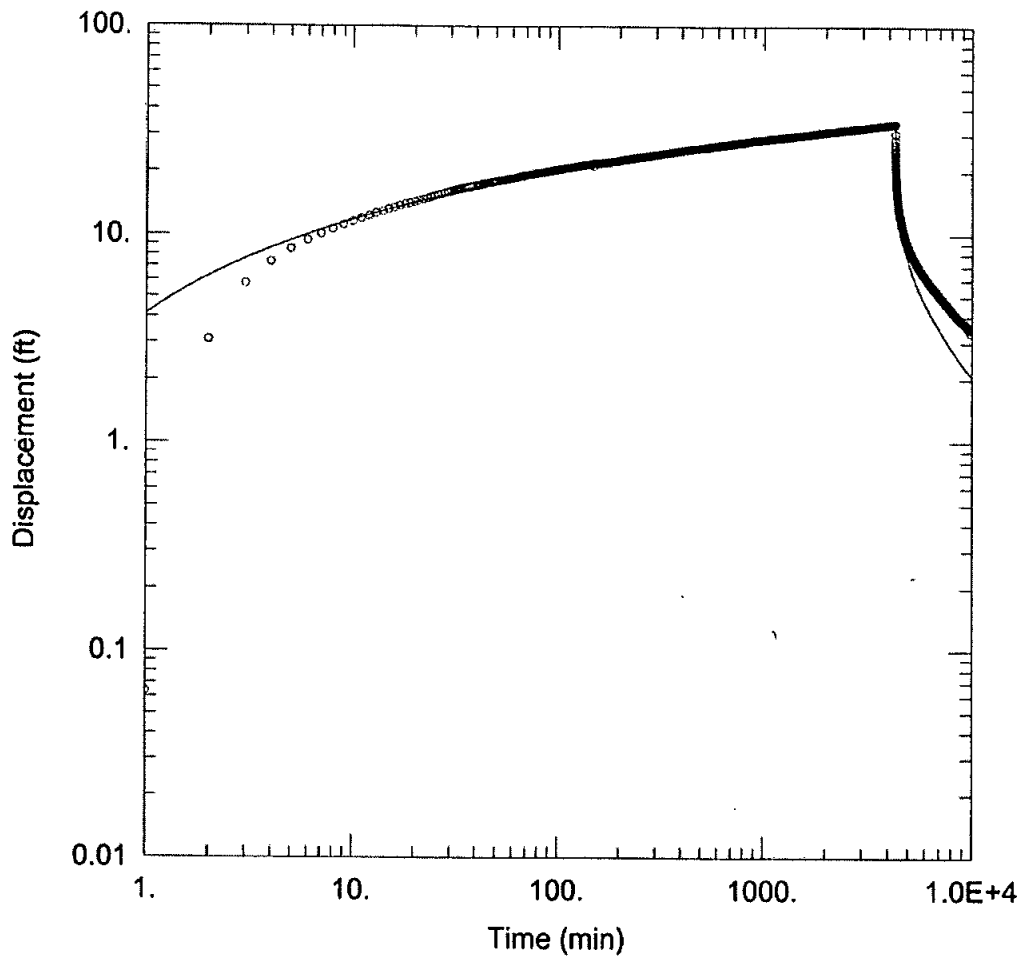
SOLUTION

Aquifer Model: Confined

Solution Method: Cooper-Jacob

T = 3394. ft²/day

S = 9.739E-8



3-DAY PUMPING TEST

Data Set: S:\Tech\Steffl - Schuelke\AqtSOLV\Obs-1 (theis).aqt

Date: 03/20/13

Time: 15:43:28

PROJECT INFORMATION

Company: LBG

Client: Steffl Drilling

Location: Millbank, SD

Test Well: Schuelke Irrigator

Test Date: 03-01-13

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Irrigator	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
◦ Obs-1	207	0

SOLUTION

Aquifer Model: Confined

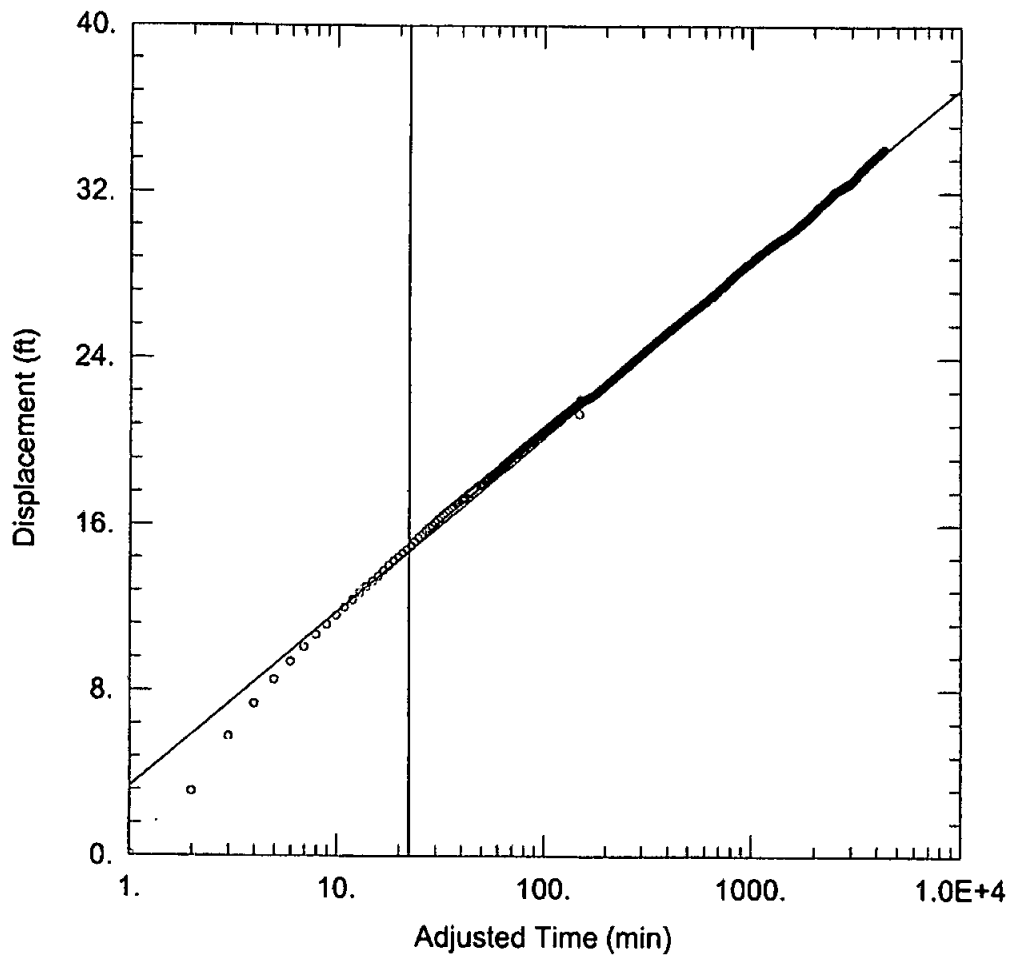
Solution Method: Theis

T = 2938.1 ft²/day

S = 4.281E-5

Kz/Kr = 1.

b = 20. ft



3-DAY PUMPING TEST

Data Set: S:\Tech\Steffl - Schuelke\AqtSOLV\Obs-1 (C-J).agt

Date: 03/20/13

Time: 15:43:45

PROJECT INFORMATION

Company: LBG

Client: Steffl Drilling

Location: Millbank, SD

Test Well: Schuelke Irrigator

Test Date: 03-01-13

AQUIFER DATA

Saturated Thickness: 20. ft

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Irrigator	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
◦ Obs-1	207	0

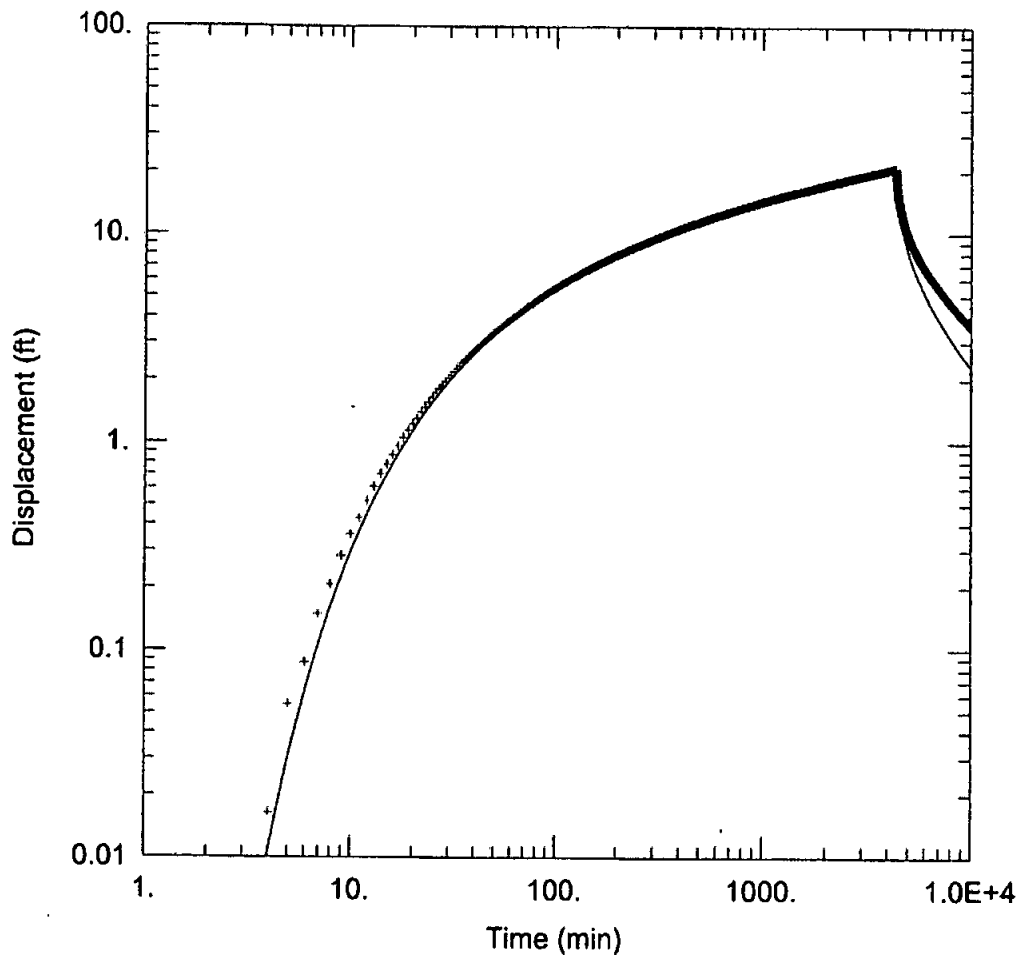
SOLUTION

Aquifer Model: Confined

Solution Method: Cooper-Jacob

$T = 2938.1 \text{ ft}^2/\text{day}$

$S = 4.281\text{E-}5$



3-DAY PUMPING TEST

Data Set: S:\Tech\Steffl - Schuelke\AqtSOLV\Obs-2 (theis).aqt

Date: 03/20/13

Time: 15:45:37

PROJECT INFORMATION

Company: LBG

Client: Steffl Drilling

Location: Millbank, SD

Test Well: Schuelke Irrigator

Test Date: 03-01-13

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Irrigator	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
+ Obs-2	1416	0

SOLUTION

Aquifer Model: Confined

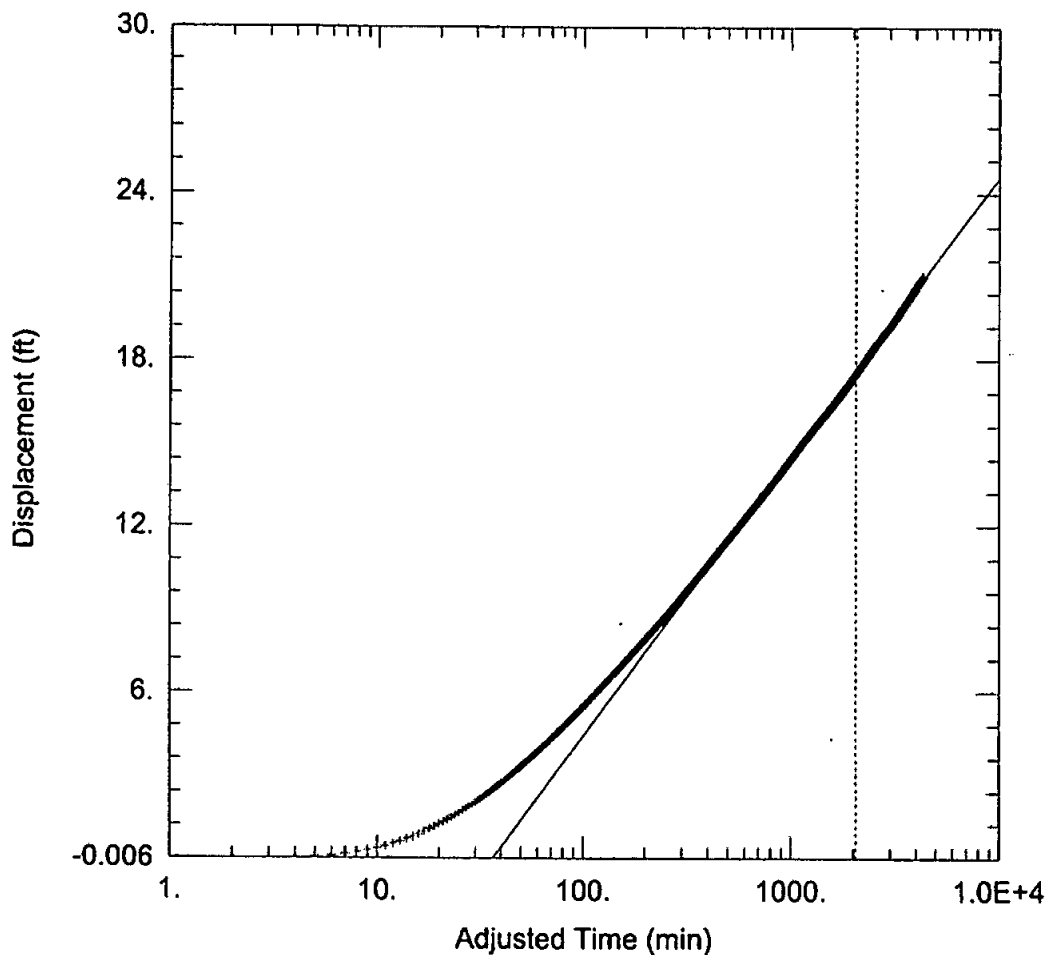
Solution Method: Theis

T = 2637 ft²/day

S = 6.298E-5

Kz/Kr = 1

b = 20 ft



3-DAY PUMPING TEST

Data Set: S:\Tech\Steffl - Schuelke\AqtSOLV\Obs-2 (C-J).aqt

Date: 03/20/13

Time: 15:45:28

PROJECT INFORMATION

Company: LBG

Client: Steffl Drilling

Location: Millbank, SD

Test Well: Schuelke Irrigator

Test Date: 03-01-13

AQUIFER DATA

Saturated Thickness: 20. ft

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Irrigator	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
+ Obs-2	1416	0

SOLUTION

Aquifer Model: Confined

Solution Method: Cooper-Jacob

$T = 2449.1 \text{ ft}^2/\text{day}$

$S = 6.972\text{E-}5$



**DEPARTMENT of ENVIRONMENT
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PIERRE, SOUTH DAKOTA 57501-3182

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April 9, 2013

NOTICE

TO: Roger Schuelke
2747 111th Avenue
Marietta MN 56257

FROM: Jeanne Goodman, Chief Engineer
Water Rights Program

SUBJECT: Scheduling Hearing on Water Permit Application No. 7541-3, Roger Schuelke

On March 7, 2013, the Water Management Board deferred consideration of Water Permit Application No. 7541-3 to appropriate groundwater from one well for irrigation in the SE ¼ Section 9, T119N, R47W. The deferral of the application was until an aquifer pump test is completed. The applicant has conducted an aquifer pump test. Enclosed is the revised recommendation and supplemental report on the DENR's review of the analysis of the pump test.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7541-3 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 is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application after it reaches a conclusion based on the facts presented at the public hearing.

The Water Management Board will consider Application No. 7541-3 at 11:00 AM on Thursday, May 2, 2013 in the Matthew Training Center, Joe Foss Building, 523 E. Capitol Ave. Pierre SD. The applicant will be provided written notice if there is a change to the hearing time or date.

Applicable provisions of the public notice published February 13, 2013 in the Watertown Public Opinion and Grant County Review will apply at the hearing.

Please contact Eric Gronlund at (605) 773-3352 if you have questions on the scheduled the hearing before the Board.

c: Diane Best, Assistant Attorney General

enclosures

CERTIFICATION

I hereby certify that on April 9, 2013, I have personally deposited with the United States mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated April 9, 2013, regarding scheduling hearing on deferred Water Permit Application No. 7541-3, Roger Schuelke, as set forth below:

Roger Schuelke
2747 111th Avenue
Marietta MN 56257

Diane Best, Assistant Attorney General
317 N Main Avenue
Sioux Falls SD 57104



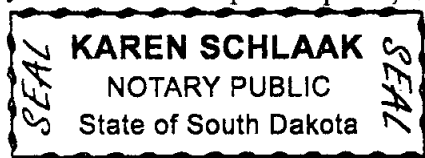
Gail Jacobson
Water Rights Program, DENR

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 9th day of April, 2019



Karen Schlaak
Notary Public
My Commission expires April 1, 2019





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 7541-3, Roger Schuelke**

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. 7541-3, Roger Schuelke, 2747 111th Avenue, Marietta MN 56157.

The Chief Engineer is recommending DEFERRAL of Application No. 7541-3 until an aquifer pump test is completed by the applicant to allow evaluation of the potential aquifer including the availability of unappropriated water and potential impacts to existing users from the aquifer which are criteria set forth in SDCL 46-2A-9 for when a water right permit may be issued.

See report on application for additional information.

Garland Erbele, Chief Engineer
February 4, 2013

NOTE: Please review the staff report carefully. In addition to insufficient information being available to adequately assess the aquifer to be used as the source, prior study on the Granite wash Aquifer indicate the aquifer may not be suitable for irrigation. If an aquifer pump test is conducted you will want to have the water quality analyzed to determine its sustainability.

REPORT TO THE CHIEF ENGINEER

WATER PERMIT APPLICATION NO. 7541-3

ROGER SCHUELKE

JANUARY 25, 2013

Water Permit Application No. 7541-3 proposes to appropriate up to 270 acre-feet per year (ac-ft/yr) at a maximum diversion rate of 2.00 cubic feet of water per second (cfs) from one well. The well is expected to be approximately 188 feet deep and is to be located in the NW¼ SE¼ of Section 9 to irrigate 135 acres located in the SE¼ of Section 9, T119N-R47W in Grant County. The application proposes a diversion rate in excess of the statutory limit.

AQUIFER: Granite wash

GEOLOGY AND AQUIFER CHARACTERISTICS:

In the area of the proposed well site, Hansen (1990) identified two aquifers: the glacial Veblen aquifer and underlying basal Granite wash. The areal extents of these outwashes are shown in Figures 1 and 2.

Several glacial outwashes in northeast South Dakota have been identified as the Veblen. For the purposes of appropriations by the SD DENR-Water Rights Program and the Water Management Board, the “Veblen aquifer” is considered as the group of buried outwash deposits in Grant County that are found within the areal extent and interval of altitude defined by Hansen (1990), which are similar to those defined by Barr Engineering (2007). This “Veblen aquifer” probably includes the Fairmont aquifer defined by Green and Gilbertson (1987) and the Wilmot outwash group defined by Thompson (2001).

The “Veblen aquifer” is predominantly a buried outwash, consisting of medium to coarse sand and fine gravel, that is mostly under artesian conditions (Hansen, 1990). Hansen (1990) reported, in Grant County, a range in aquifer depth of one to 210 feet below ground surface, an average aquifer thickness of 28 feet, and an average static water level of 29 feet below ground surface. In the area of the proposed well site, the “Veblen aquifer” is generally less than 20 feet thick (Barr Engineering, 2007; Hansen, 1990). The “Veblen aquifer” is estimated to contain 700,000 acre-feet (ac-ft) of water in storage in Grant County (Hansen, 1990). According to Hansen (1990), the water in this aquifer is suitable for irrigation.

The Granite wash aquifer consists of uncemented, pink to blue to gray, sand containing approximately 50 percent feldspar. The aquifer is under artesian conditions and overlies the Precambrian rock often named the Milbank granite (Hansen, 1990). Hansen (1990) reported, in Grant County, a range in aquifer depth of 75 to 444 feet below ground surface, an average aquifer thickness of 37 feet, and an average static water level of 22 feet below ground surface. In the area of the proposed well site, the Granite wash aquifer is approximately 40 feet thick. The Granite wash aquifer is estimated to contain 650,000 ac-ft of water in storage in Grant County (Hansen, 1990). According to Hansen (1990), the water in this aquifer is not suitable for irrigation.

Hansen (1990) completed four east to west geologic sections of Grant and Codington Counties. A map of the location of these geologic sections is shown in Figure 3. The proposed well site is located between geologic sections B-B' and C-C', approximately one mile north of B-B' and one half mile west of the South Dakota and Minnesota border. Geologic sections B-B' and C-C' are shown in Figures 4 and 5, respectively.

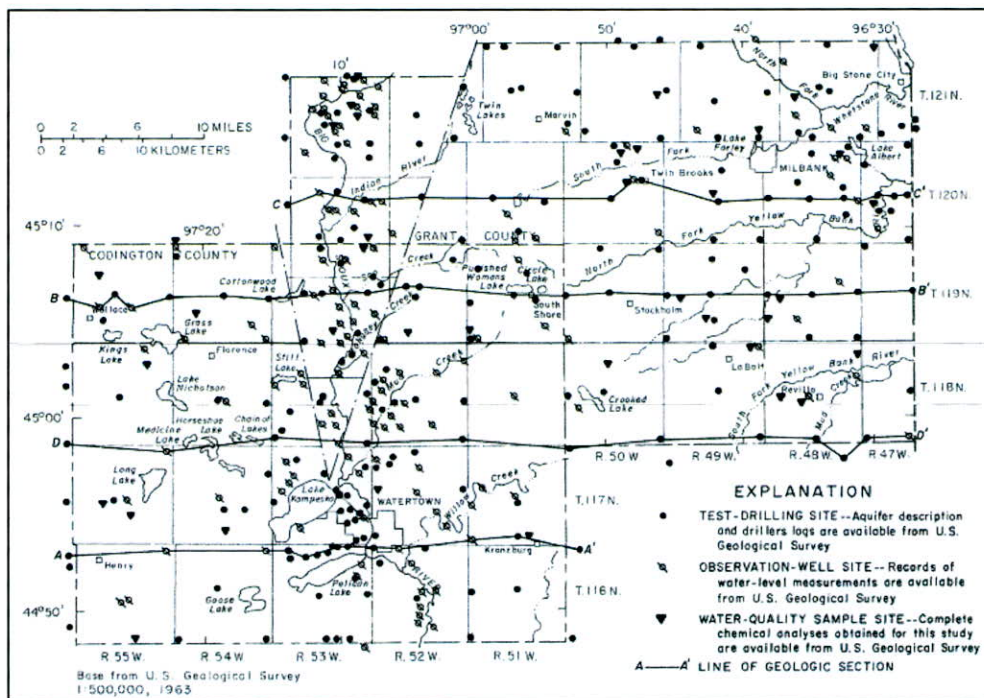


Figure 3: Map of geologic sections by Hansen (1990) (modified from Hansen, 1990)

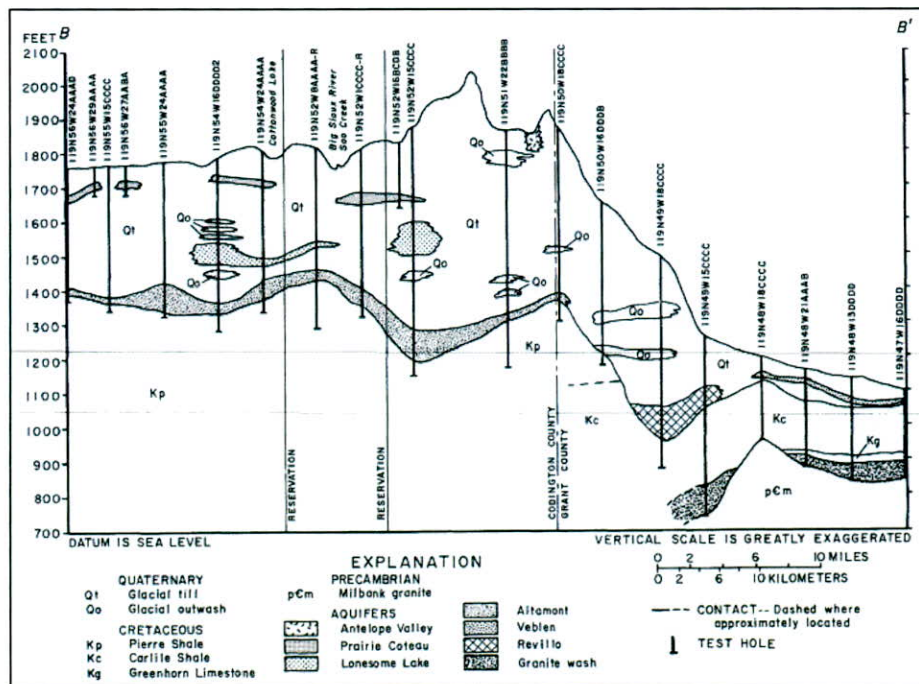


Figure 4: Geologic section B-B' (modified from Hansen, 1990)

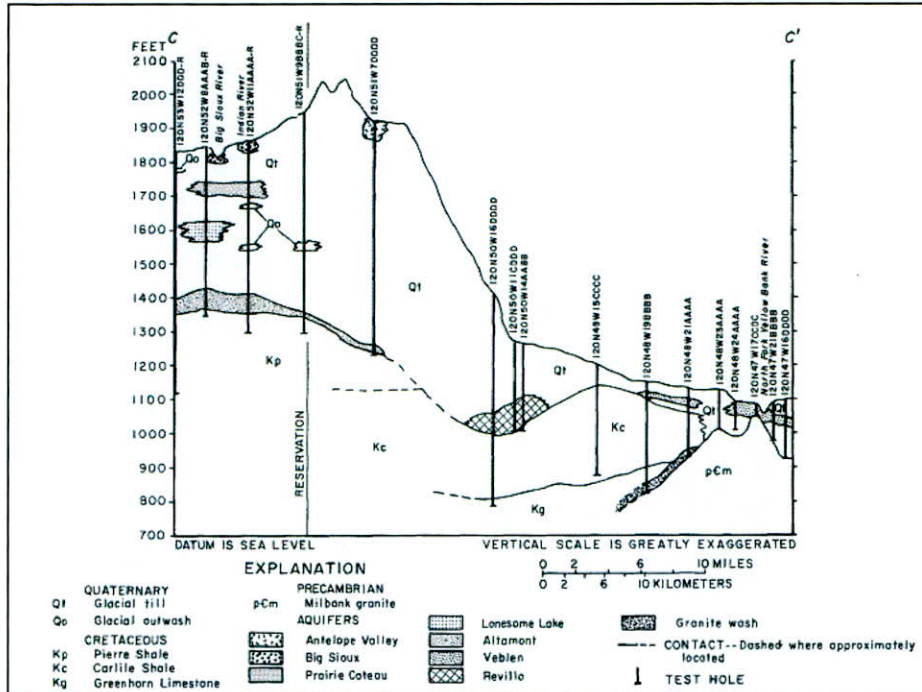


Figure 5: Geologic section C-C' (modified from Hansen, 1990)

From these geologic sections, the “Veblen aquifer” overlies the Granite wash aquifer where present. Both the Carllile shale and Greenhorn limestone can be encountered between these two aquifers, often at a total of 100 feet thick or more. The “Veblen aquifer” is usually overlain and directly underlain by glacial till. Below the Granite wash aquifer the Milbank granite is encountered. The Milbank granite can come into contact with the “Veblen aquifer” in some areas where the Granite wash aquifer is not present.

The test hole log information submitted with this application is shown in Table 1. A south to north geologic section was created using this test hole log and surrounding lithologic logs (“Lithologic Logs Database”). A map of this geologic section is shown in Figure 6 and the geologic section created, A-A', is shown in Appendix A.

Table 1: Test hole log information submitted with this application

Formation			Depth	
			From	To
Top Soil	Black	M	0	1
Sand	Brown	M	1	16
Clay	Blue	M	16	38
Sand	Wht	M 12slt	38	45
Clay	Blue	M sticky	45	168
Sand	Gray	M	168	188
Sandy Clay	Blue	M	188	202

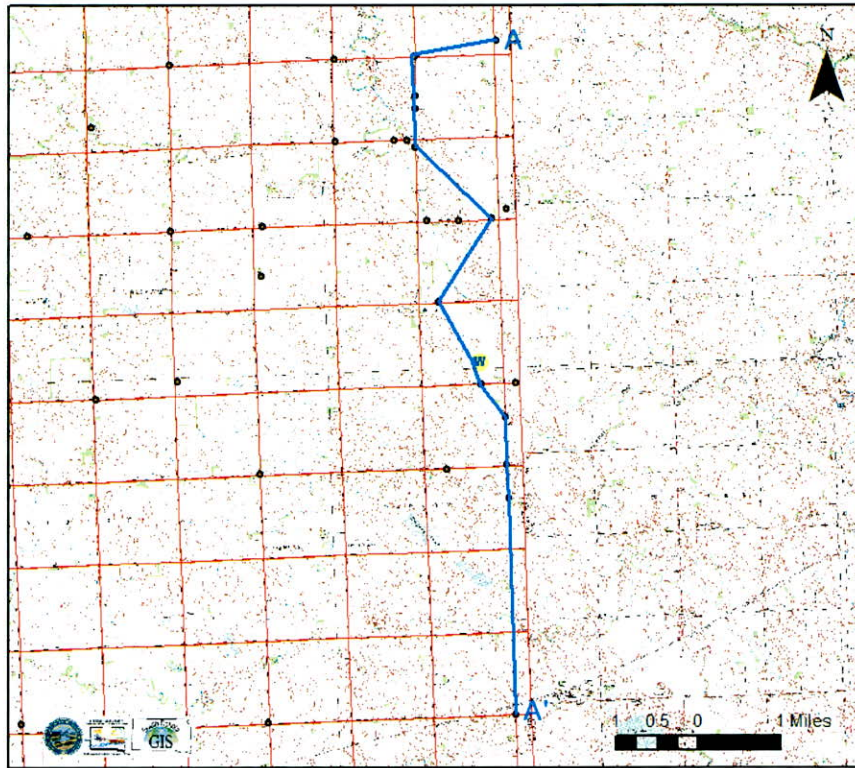


Figure 6: Map of geologic section A-A' created using lithologic logs and test hole information submitted with this application ("Lithologic Logs Database")

Geologic section A-A' shows a similar stratification of the geologic sections created by Hansen (1990) in the area of the proposed well site. The stratification documented in the test hole log submitted with this application generally coincides with the surrounding lithologic logs. In the test hole log, the uppermost sand layer is probably included in the till, the sand layer encountered from 38 to 45 feet below ground surface is likely the "Veblen aquifer," and the deepest sand layer encountered is likely the Granite wash aquifer.

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 that are pertinent to this application.

WATER AVAILABILITY:

This application proposes to appropriate 270 ac-ft/yr from the Granite wash 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:

Hansen (1990) indicated that recharge from the Granite wash aquifer is in part dependent on yearly and seasonal precipitation. Discharge occurs due to stock watering and domestic wells, outflow to fractures in the Milbank granite, and to granite quarries near Milbank, north of the proposed well site (Hansen, 1990).

There are no water rights/permits appropriating groundwater from this aquifer in South Dakota. Near the aquifer outcrop in T120N-R47W, there are three water rights/permits completed into the hydraulically connected Precambrian rock, known as the Milbank granite, for industrial use for dewatering quarries to allow granite mining. These authorize a total maximum diversion rate of 2.91 cfs (Water Rights, 2013b). There are several domestic wells on record with the SD DENR-Water Rights Program within the areal extent that could be completed into the Granite wash aquifer (Water Rights, 2013c). Generally, annual withdrawal due to domestic use is not considered significant to the hydrologic budget of an aquifer.

Withdrawals from the Granite wash aquifer are likely relatively small compared to the estimated 650,000 ac-ft of water in storage (Hansen, 1990). This is not to suggest that all the water within the aquifer is available for this proposed appropriation, but to demonstrate that in general the Granite wash aquifer is an unexploited resource. The general nonuse can be attributed at least in part to the aquifer's unsuitability for irrigation noted by Hansen (1990). Also, the shallower "Veblen aquifer" is present over much of the areal extent of the Granite wash aquifer in South Dakota and is generally considered a viable groundwater source (Hansen, 1990).

The recharge rate and discharge due to withdrawals have not been quantified for the Granite wash aquifer in South Dakota. From the best information reasonably available, the probability of annual withdrawals exceeding average annual recharge of the Granite wash aquifer cannot be determined. Therefore, the probability of unappropriated water available from the Granite wash aquifer cannot be evaluated.

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 SD DENR-Water Rights Program does not monitor any observation wells completed into the Granite wash aquifer (Water Rights, 2013a). An observation well located in Section 2 of T120N-48W, approximately eight miles northwest of the proposed well site, recorded water level fluctuations of this aquifer from 1985 to 1987 (Hansen, 1990). The hydrograph of this well is shown in Figure 8. The observation well data documents cyclic conditions of water levels, indicating that the aquifer could in fact recharge during wet years and decline during dry years as indicated by (Hansen, 1990). At the current level of aquifer development, the effects of well withdrawals have not been documented.

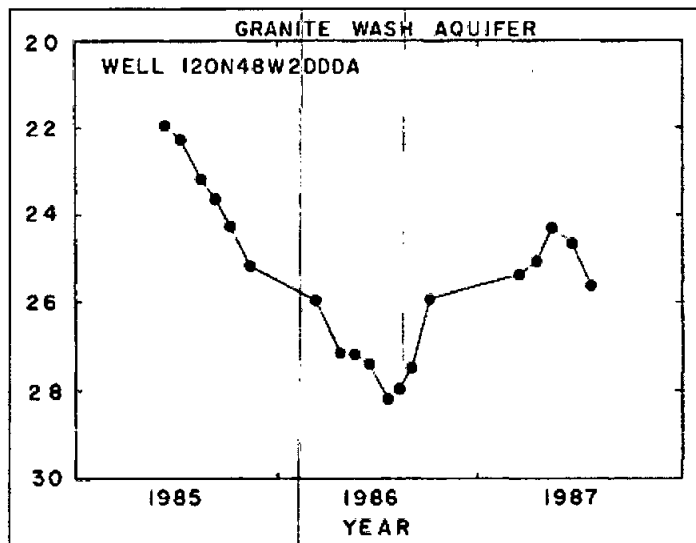


Figure 8: Hydrograph of an observation well completed into the Granite wash aquifer (modified from Hansen, 1990)

A current record of observation well measurements is not available from the Granite wash aquifer. It cannot be determined if the quantity of water discharged annually is exceeding the estimated annual recharge of the Granite wash aquifer. Therefore, the probability of unappropriated water available from the Granite wash aquifer cannot be evaluated.

EXISTING WATER RIGHTS:

There are no water rights/permits appropriating groundwater from this aquifer in South Dakota. Near the aquifer outcrop in T120N-R47W, there are three water rights/permits completed into the hydraulically connected Milbank granite. These are located approximately six miles north of the proposed well site, on the opposite edge of the void in the Granite wash aquifer (Water Rights, 2013b). There are several domestic wells on record with the SD DENR-Water Rights Program that are located within the areal extent and at a depth within the interval of altitude of the Granite wash aquifer (Water Rights, 2013c). The nearest domestic wells that could be completed into this aquifer in South Dakota are located further than one mile from the proposed well site.

The Granite wash aquifer appears to be under confined conditions and is probably artesian at the proposed well site; therefore, some drawdown due to pumping is likely. The Water Management Board has consistently recognized that to place water to maximum beneficial use a certain amount of drawdown may occur. SDCL 46-6-6.1 does not require protection of artesian head pressure as a means of groundwater delivery. However, reasonable domestic use must be assured before irrigation use is allowed. Therefore, when considering irrigation projects, the Water Management Board must give consideration to maintaining artesian head pressure as a method of delivery for domestic wells.

To balance interests between irrigation use and delivery of groundwater by artesian pressure, ARSD 74:02:04:20(7) defines an adversely impacted domestic well 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 Granite wash aquifer at the proposed well site, some existing well owners may need to lower their pumps to accommodate for reduction of head pressure.

The potential for adverse or unlawful impairment of existing users due to the development of the proposed diversion cannot be determined because sufficient information is not currently available to accurately appraise the characteristics of the Granite wash aquifer in the area of the proposed well site. An aquifer pump test, including monitoring wells, should be conducted to aid in the evaluation of this aquifer to allow for the consideration of the availability of unappropriated water from the aquifer and potential impacts to existing users as required by SDCL 46-2A-9.

SDCL 46-5-6

Pursuant to SDCL 46-5-6, the diversion rate for an irrigation appropriation cannot be in excess of one cubic foot of water per second for every 70 acres, or “the equivalent thereof.” The statute provides that the Water Management Board may allow a greater diversion if the method of irrigation so requires.

This water permit application proposes to divert at a rate of 2.00 cfs per 135 acres, equaling 1.04 cfs per 70 acres. Justification for the diversion rate in excess of the statutory limit was not provided.

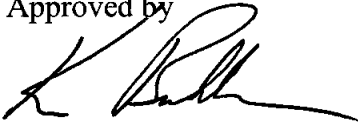
CONCLUSIONS:

1. The application proposes to appropriate 270 ac-ft/yr for irrigation; however, the actual use will likely be less.
2. From the best information reasonably available, the probability of unappropriated water available from the Granite wash aquifer for the proposed appropriation cannot be determined.
3. Because a record of observation well measurements is not available, the probability of unappropriated water available from the Granite wash aquifer from the proposed appropriation cannot be evaluated.
4. Sufficient information on the aquifer characteristics is not currently available to determine the potential for adverse or unlawful impairment of existing users due to the development of the proposed diversion.
5. An aquifer pump test including monitoring wells should be conducted to aid in the evaluation of this aquifer.
6. This application has requested an additional diversion rate in excess of one cfs per 70 acres.



Joseph R Stonesifer
SD DENR-Water Rights Program

Approved by



Ken Buhler
SD DENR-Water Rights Program

REFERENCES:

Barr Engineering. 2007. Groundwater Supply Evaluation, Big Stone II Project, Grant County, South Dakota: Prepared for Otter Tail Power Company

Green, S. and Gilbertson J.P. 1987. Ground-water Investigation for Big Stone City, South Dakota. South Dakota DENR-Geological Survey, Vermillion, South Dakota.

Hansen, D.S. 1990. Water Resources of Codington and Grant Counties, South Dakota: U.S. Geological Survey Water-supply Paper 2254, 263 p.

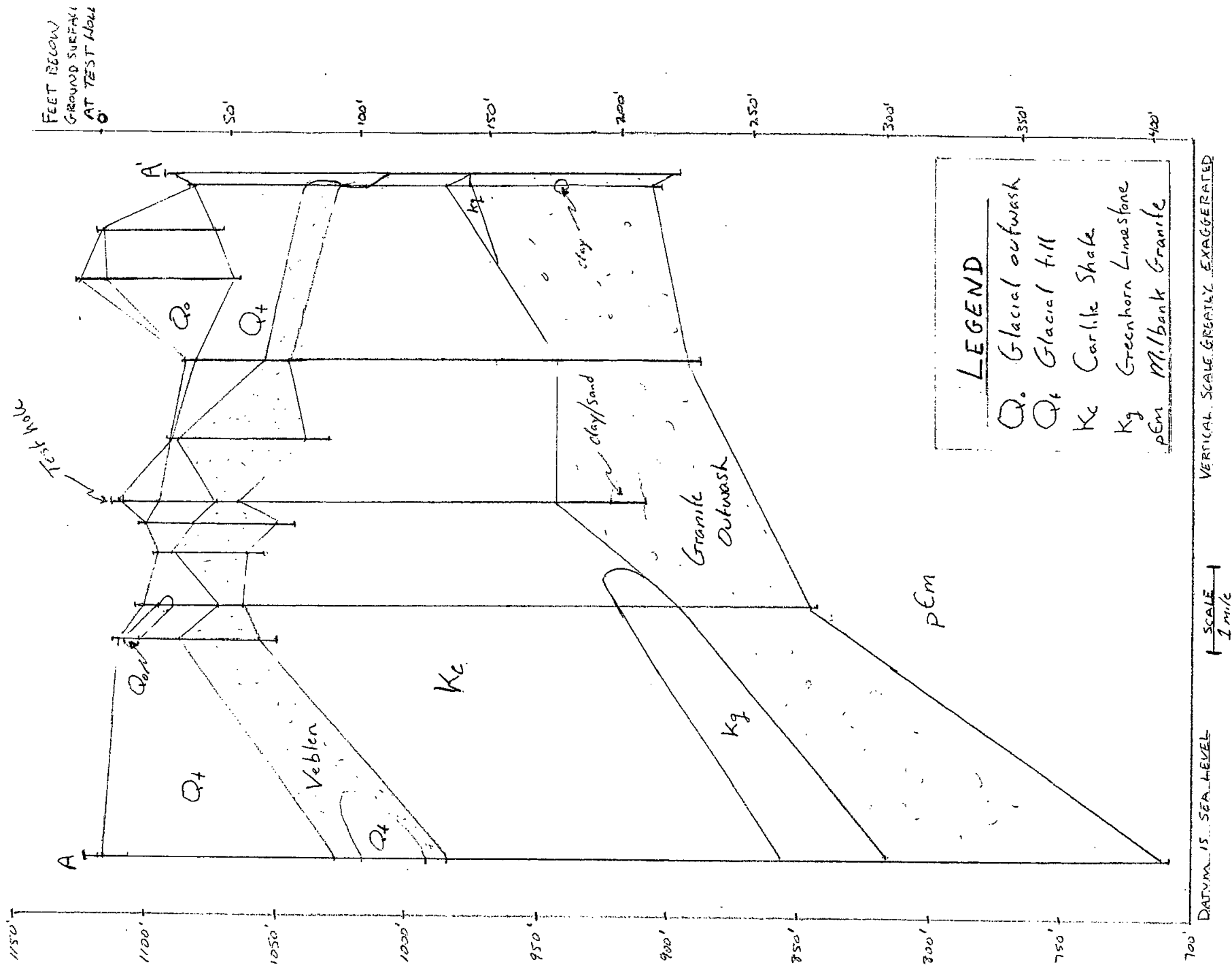
“Lithologic Logs Database.” SD DENR- Geological Survey Program. 24 January 2013

Thompson, R.F. 2001. Water Resources of the Lake Traverse Reservation, South and North Dakota, and Roberts County, South Dakota: U.S. Geological Survey Water-Resource Investigation Report 01-4219

Water Rights. 2013a. Observation Well Files, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

Water Rights. 2013b. Water Right/Permit Files, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

Water Rights. 2013c. Water Well Completion Reports, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.



APPENDIX A - GEOLOGIC SECTION A-A'



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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PIERRE, SOUTH DAKOTA 57501-3182

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**REVISED RECOMMENDATION OF CHIEF ENGINEER FOR WATER
PERMIT APPLICATION NO. 7541-3, Roger Schuelke**

Pursuant to SDCL 46-2A-2, the following is the revised recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 7541-3, Roger Schuelke, 2747 111th Avenue, Marietta MN 56257.

The Chief Engineer is recommending APPROVAL of Application No. 7541-3 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. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.
3. A perpetual easement shall be granted to the State for "Obs-2" completed as part of the aquifer pump test the purpose of incorporating into the South Dakota Department of Environment and Natural Resources-Water Rights Program Observation Well Network.

See report on application for additional information.

Jeanne Goodman, Chief Engineer
April 5, 2013

SUPPLEMENTAL REPORT TO THE CHIEF ENGINEER

WATER PERMIT APPLICATION NO. 7541-3

ROGER SCHUELKE

April 5, 2013

Water Permit Application No. 7541-3 proposes to appropriate water at a maximum diversion rate of 2.00 cubic feet of water per second (cfs) from one well. The well is expected to be approximately 188 feet deep and is to be located in the NW¼ SE¼ of Section 9 to irrigate 135 acres located in the SE¼ of Section 9, T119N-R47W in Grant County. The application proposes a diversion rate in excess of the statutory limit.

On February 4, 2013, the Chief Engineer recommended DEFERRAL of this water permit application until an aquifer pump test is completed by the applicant to allow evaluation of the Granite wash aquifer, including the availability of unappropriated water and potential impacts to existing users aquifer, which are criteria set forth in SDCL 46-2A-9. The recommendation also specifically noted the possible unsuitability of the aquifer for irrigation. On March 7, 2013, the Water Management Board agreed with the Chief Engineer's recommendation and subsequently deferred this water permit. Additional information can be found in Stonesifer (2013).

An aquifer pump test was conducted beginning March 1, 2013, by Steffl Drilling & Pump, Inc. Leggette, Brashears & Graham, Inc. completed an analysis of the pump test and submitted a report (Leggette, Brashears & Graham, Inc.).

Pump Test: Wells named Obs-1 and Obs-2 were constructed 207 feet west and 1,416 feet south of the irrigation well, respectively. The pump test was conducted over a nine day period: three days prepumping, three days (t) pumping at 700 gpm, and three days recovery. Drawdown and recovery water levels were measured in all wells. Drawdown water levels appeared to reach a steady state. Water levels recovered to 80 percent or greater. Based on the data, specific capacity of the aquifer at the well is 8.3 gpm/ft.

Analysis: The Granite wash acts as a confined aquifer and negative boundary conditions were not observed. Therefore, the Theis and Cooper-Jacob solutions were used to determine aquifer parameters. The transmissivity (T) averaged 2,950 ft²/d, the hydraulic conductivity (K) averaged 148, and the storativity (S) averaged 5.5E-05. The irrigation well is not expected to adversely impact nearby existing users of the Granite wash aquifer nor the overlying "Veblen" aquifer.

The pump test analysis incorporated the Theis and Cooper-Jacob solutions, which are appropriate. The analysis appears valid. While the conclusion that due to the till separation the "Veblen" is not likely to be effected is rational, the pump test does not explicitly provide data to support this conclusion.

WATER AVAILABILITY

Hydrologic Budget:

Distance-drawdown of the three wells was plotted on a log-log scale. In applying the average T and S along with t provided to a modification of the Cooper-Jacob Method equation (shown below), measurable drawdown (r_o) extends to approximately 3.6 miles at the end of the pump test (Sterrett, 2007).

$$r_o = \sqrt{\frac{Tt}{12,423,530 \times S}}$$

where: t= pump time (days)
T= transmissivity (ft²/d)
S = storativity
 r_o = extent of drawdown (miles)

Because negative boundary conditions were not observed in the pump test, the aquifer has a radius of at least the extent of measureable drawdown. Assuming the shape of a perfect circle, the aquifer underlies 26,000 acres. For management and development programs, Hedges and others (1985) suggests a recharge rate range of 0.15 to 0.60 in/yr for confined aquifers. Therefore, recharge is estimated to be at least 325 ac-ft/yr.

The applicant proposes to irrigate 135 acres. While the maximum permitted application rate is 24 in/acre, is it likely the applicant will not pump nearly this amount. Applying a conservative application rate of 12 in/acre, the pumpage is expected to be at most 135 ac-ft/yr.

Based on these conservative assumptions, there is a reasonable probability that unappropriated water is available from the Granite wash aquifer for the proposed appropriation.

Observation Well Data:

Drawdown water levels appeared to become stabilized and water levels did recover from pumping, both of which indicate that the Granite wash aquifer is recharging to some extent.

The SD DENR-Water Rights Program does not currently monitor any observation wells completed into this aquifer. The observation well referred to as Obs-2 would aid in monitoring water levels. As discussed with the applicant, a perpetual easement shall be granted to the State for the purpose of maintaining an observation well.

EXISTING WATER RIGHTS

There are no water rights/permits appropriating groundwater from the Granite wash aquifer in South Dakota (Water Rights, 2013b). The nearest domestic wells that could be completed into this aquifer in South Dakota are located further than one mile from the irrigation well (Water Rights, 2013c).

In applying the average T and S provided to the Theis equation, if the irrigation well pumps at maximum proposed diversion rate of 900 gpm for 185 days continuously, the estimated maximum drawdown would be approximately 30 feet at a distance of one mile and approximately 24 feet at a distance of two miles, as shown in Figure 1 ("Theis Equation Calculator"). At least 50 feet of artesian head pressure would remain in the aquifer.

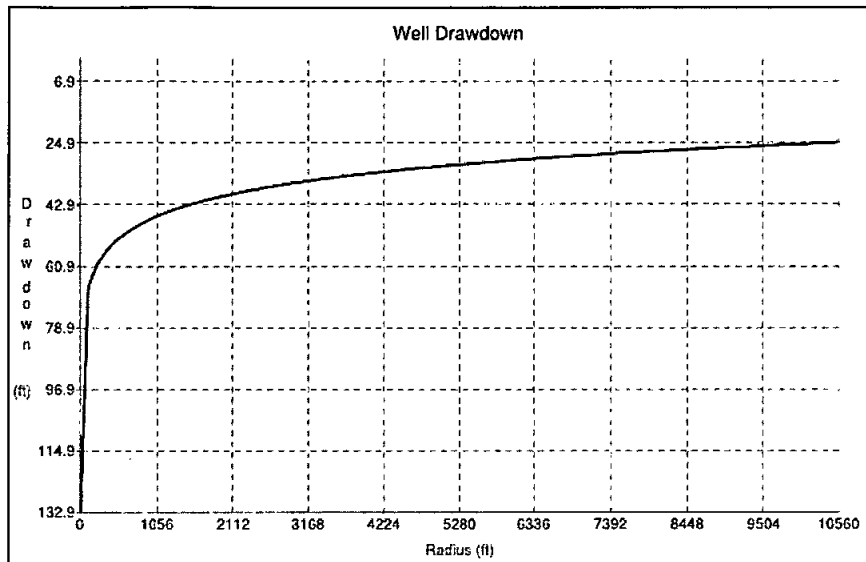
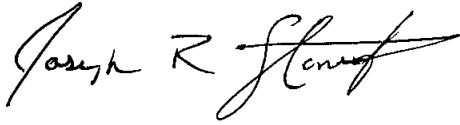


Figure 1: Distance-drawdown curve at maximum conditions ("Theis Equation Calculator")

The pump test results indicate that there is a reasonable probability that any well interference from the proposed appropriation will not adversely or unlawfully impair existing nearby wells.

CONCLUSIONS:

1. Water Permit Application No. 7541-3 proposes to appropriate water at a maximum diversion rate of 2.00 cfs from one well completed into the Granite wash aquifer to irrigate 135 acres in Grant County.
2. The Chief Engineer recommended DEFERRAL of this water permit application until an aquifer pump test is completed by the applicant to allow evaluation of the Granite wash aquifer. The Water Management Board agreed with the Chief Engineer's recommendation and subsequently deferred this water permit.
3. An aquifer pump test was conducted and an analysis was completed and submitted. The pump test analysis was appropriate and appears valid.
4. Based on conservative assumptions of the hydrologic budget, there is a reasonable probability that unappropriated water is available from the Granite wash aquifer for the proposed appropriation.
5. Drawdown water levels appeared to become stabilized and water levels did recover from pumping, both of which indicate that the Granite wash aquifer is recharging to some extent. The observation well referred to as Obs-2 would aid in monitoring water levels. A perpetual easement shall be granted to the State for the purpose of maintaining an observation well.
6. A maximum conditions distance-drawdown analysis indicates that there is a reasonable probability that any well interference from the proposed diversion will not adversely or unlawfully impair existing users.



Joseph R Stonesifer
SD DENR-Water Rights Program

Approved by



Ken Buhler
SD DENR-Water Rights Program

REFERENCES:

Hedges, L.S., Allen, J., and Holly, D.E. 1985. Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota and Iowa. Task 7: Ground Water Recharge. South Dakota DENR-Geological Survey, Vermillion, SD.

Sterrett, R.J. 2007. Groundwater & Wells, Third Edition. New Brighton, Minnesota: Johnson Screens.

Leggette, Brashears & Graham, Inc. 2013. Aquifer Pump Test Results, Robert Schuelke Irrigation Well, DENR Water Permit Application No. 7541-3. St. Paul, Minnesota.

Stonesifer, J.R.: 2013. Report on Water Permit Application No. 7541-3, Roger Schuelke. SD DENR-Water Rights Program. Joe Foss Bldg., Pierre, South Dakota.

"Theis Equation Calculator." I-calcul8 Calculators and Tools. 2 April 2013
< <http://www.icalcul8.com/theis.php>>

Water Rights. 2013b. Water Right/Permit Files, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

Water Rights. 2013c. Water Well Completion Reports, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

RECEIVED

} ss.

FEB 15 2013

Ann Tuchscherer

Application No. 7541-3 to Appropriate Water
Roger Schuelke

February 13 2013	20
20	20
20	20

Ann Pucksherer

Debra Hemmer

Publication Fee	\$ 57.82
Notarial Fee	\$
Total	\$ 57.82

Any interested person who intends to participate in the hearing shall file a petition to oppose or support the application and the petition shall be filed with BOTH the applicant and Chief Engineer. The applicant must also file a petition if opposed to 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 February 25, 2013. The petition may be informal, but shall be in writing and shall 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

Printer's Affidavit of Publication
and Attorney's Affidavit Ex-Rel. Fees

In _____ Court

STATE OF SOUTH DAKOTA }
COUNTY OF GRANT } ss.

Filed in the office of _____

on the

day of _____, 20__

Attorney for _____

mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. The hearing is an adversary proceeding and any party has the right to be present at the hearing and to be represented by a lawyer. These and other due process rights will be forfeited if they are exercised at the hearing and decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law.

The March 7, 2013 hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any person who has filed a petition to oppose or support the application. The request for an automatic delay must be filed by February 25, 2013. If an automatic delay is requested, the hearing will be rescheduled for a future Board meeting and personal notice will be provided to all petitioners regarding the time, date and location.

Contact Eric Gronlund by February 25, 2013 at the above Chief Engineer's address to request copies of the staff report, recommendation, appli-

APPLICATION
appropriate Water

cation or other information. Notice is given to individuals with disabilities that this hearing is being held in a physically accessible place. Please notify the Department of Environment and Natural Resources at least 48 hours before the hearing if you have a disability for which special arrangements must be made at the hearing. The telephone number for making arrangements is (605)773-3352.

Under SDCL 1-26-17(7) notices must state that "if the amount in controversy exceeds \$2,500.00 or if a property right may be terminated, any party to the contested case may require the agency to use the Office of Hearing Examiners by giving notice of the request to the agency no later than ten days after service of a notice of hearing issued pursuant to SDCL 1-26-17." This is a Notice of Hearing, service is being provided by publication, and the applicable date to give notice to the Chief Engineer is February 25, 2013. However, since this particular matter is a water permit application and not a monetary controversy in excess of \$2,500.00 or termination of a property right the Chief Engineer disputes the applicability of this provision and maintains that the hearing must be conducted by the Board.

As applicable, the following provides the legal authority and jurisdiction under which the hearing will be held and the particular statutes and rules pertaining to this application: SDCL 1-26-16 thru 1-26-28; SDCL 46-1-1 thru 46-1-9, 46-1-13 thru 46-1-16; 46-2-3.1, 46-2-9, 46-2-11, 46-2-17; 46-2A-1 thru 46-2A-12, 46-2A-14, 46-2A-15, 46-2A-20, 46-2A-21, 46-2A-23; 46-5-1.1, 46-5-2 thru 46-5-26, 46-5-30.2 thru 46-5-30.4, 46-5-31, 46-5-32 thru 46-5-34.1, 46-5-38 thru 46-5-39, 46-5-46, 46-5-47, 46-5-49; 46-6-1 thru 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14, 46-6-21, 46-6-26; and Board Rules ARSD 74:02:01:01 thru 74:02:01:25.02; 74:02:01:35.01.

Steven M. Pirner, Secretary
Department of Environment and
Natural Resources

Published once at an approximate
cost of \$57.82.

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FEB 21 2013

WATER RIGHTS
PROGRAM

Form 8

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
) SS
County of Codington)

I, Monica K. Saathoff

certify that the attached printed Notice was
taken

from the Watertown Public Opinion

printed and published in Watertown

County of Codington and

state of South Dakota. The notice was
published

in the newspaper on the following date:

February 13th, 2013

Cost of Printing \$132.82

Monica K Saathoff
(Signature)

Bookkeeper
(Title)

February 13th, 2013
(Date Signed)

DEPARTMENT
OF ENVIRON-
MENT AND
NATURAL
RESOURCES

NOTICE OF HEARING on
Application No. 7541-3 to
Appropriate Water

Notice is given that Roger Schuelke, 2747 111th Ave, Marietta MN 56257 has filed an application for a water permit to appropriate 2.0 cubic feet of water per second from one well to be completed into the Granite wash Aquifer (188 feet deep) located in the NW 1/4 SE 1/4 Section 9 for irrigation of 135 acres located in the SE 1/4 Section 9; all in T119N-R47W. The applicant is requesting a diversion rate greater than the statutory limit.

SDCL 46-2A-4(10) provides that "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 Chief Engineer's recommendation and no hearing may be held before the board, unless the Chief Engineer makes a finding that an application, even if uncontested, presents important issues of public policy or public interest that should be heard by the board." In this case, the Chief Engineer finds that this application presents important issues of public interest

that should be heard by the Water Management Board.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends DEFERRAL of Application No. 7541-3 until an aquifer pump test is completed by the applicant to allow evaluation of the potential aquifer including the availability of unappropriated water and potential impacts to existing users from the aquifer which are criteria set forth in SDCL 46-2A-9 for when a water right permit may be issued.

The Water Management Board will consider this application at 8:30 a.m. on March 7, 2013 in the Matthew Training Center, Joe Foss Bldg, 523 E. Capitol Ave, Pierre SD. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application based on the facts presented at the public hearing.

Any interested person who intends to participate in the hearing shall file a petition to oppose or support the application and the petition shall be filed with BOTH the applicant and Chief Engineer. The applicant must also file a petition if opposed to 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 February 25, 2013. The petition may be informal, but shall be in writing and shall 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. The hearing is an adversary proceeding and any party has the right to be present at the hearing and to be represented by a lawyer. These and other due process rights will be forfeited if they are not exercised at the hearing and decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law.

The March 7, 2013 hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any person who has filed a petition to oppose or support the application. The request for an automatic delay must be filed by February 25, 2013. If an automatic delay is requested, the hearing will be rescheduled for a future Board meeting and personal notice will be provided to all petitioners regarding the time, date and location.

Contact Eric Gronlund by February 25, 2013 at the above Chief Engineer's address to request copies of the staff report, recommendation, application or other information. Notice is given

to individuals with disabilities that this hearing is being held in a physically accessible place. Please notify the Department of Environment and Natural Resources at least 48 hours before the hearing if you have a disability for which special arrangements must be made at the hearing. The telephone number for making arrangements is (605) 773-3352.

Under SDCL 1-26-17(7) notices must state that "if the amount in controversy exceeds \$2,500.00 or if a property right may be terminated, any party to the contested case may require the agency to use the Office of Hearing Examiners by giving notice of the request to the agency no later than ten days after service of a notice of hearing issued pursuant to SDCL 1-26-17." This is a Notice of Hearing, service is being provided by publication, and the applicable date to give notice to the Chief Engineer is February 25, 2013. However, since this particular matter is a water permit application and not a monetary controversy in excess of \$2,500.00 or termination of a property right the Chief Engineer disputes the applicability of this provision and maintains that the hearing must be conducted by the Board.

As applicable, the following provides the legal authority and jurisdiction under which the hearing will be held and the particular statutes and rules pertaining to this application: SDCL 1-26-16 thru 1-26-28; SDCL 46-1-1 thru 46-1-9, 46-1-13 thru 46-1-16; 46-2-3.1, 46-2-9, 46-2-11, 46-2-17; 46-2A-1 thru 46-2A-12, 46-2A-14, 46-2A-15, 46-2A-20, 46-2A-21, 46-2A-23; 46-5-1.1, 46-5-2 thru 46-5-26, 46-5-30.2 thru 46-5-30.4, 46-5-31 46-5-32 thru 46-5-34.1, 46-5-38 thru 46-5-39, 46-5-46, 46-5-47, 46-5-49; 46-6-1 thru 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14, 46-6-21, 46-6-26; and Board Rules ARSD 74:02:01:01 thru 74:02:01:25.02; 74:02:01:35.01.

Steven M. Pirmer, Secretary, Department of Environment and Natural Resources.

Published once at the approximate cost of \$127.75. (February 13, 2013)

All legal notices in the Public Opinion and other South Dakota newspapers can be found at
www.sdpublishing.com



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov

February 5, 2013

Grant County Review
PO Box 390
Milbank SD 57252

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 7541-3 to Appropriate Water. Please publish the notice once on February 13, 2013. 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 Roger Schuelke, 2747 111th Ave., Marietta MN 56157 (Ph # 320-668-2532).

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

February 5, 2013

Public Opinion
PO Box 10
Watertown SD 57201

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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

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

February 5, 2013

Roger Schuelke
2747 111th Ave
Marietta MN 56157

Dear Mr. Schuelke:

Water Permit Application No. 7541-3 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 Grant County Review printed at Milbank SD (Ph # 605-432-4516) and the Public Opinion printed at Watertown SD (Ph # 605-886-6901). You will need to contact the newspaper(s) and authorize publication of this notice. For your information, a copy of the notice, the recommendation of the Chief Engineer and report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

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

Sincerely,


Eric Gronlund
Natural Resources Engineer
(605) 773-3352

enclosures

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

Instruction to Newspaper – Publish the Notice on February 13, 2013. 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.

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Steven M. Pirner, Secretary, Department of Environment and Natural Resources. Published once at an 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

JUN 21 2013

Roger Schuelke
2747 111th Ave
Marietta MN 56257

Dear Mr. Schuelke:

Enclosed is Water Permit No. 7541-3 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,

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

enclosures

7541-3

SD EForm - 1621LD V1

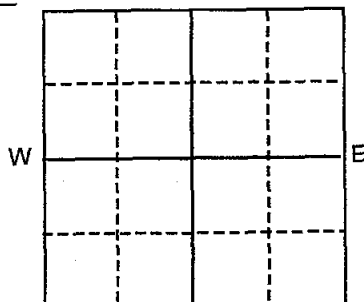
SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NW ¼ SE ¼ Sec 9 Twp 119 Rg 47

County Grant

North

Please mark well
location with an "X"

Well Completion Date

October 23, 2012

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:

mud rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	12.00 IN	0.0 FT	168.0 FT	18.00 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Red Flint #60	30	Lb/gal	153.0 Ft	188.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
Tremmy

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 12.00 Inches Length 20.0 Feet

Material stainless steel

Slot Size 60 Set From 168.0 Feet to 188.0 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?
Lab to which water
quality sample sent for analysis

Well Owner: Roger Schuelke

Business Name:

Address: 2747 11th AVE

City, State, Zip: Marietta MN 56257

WELL LOG:

			DEPTH	
FORMATION			FROM	TO
top soil	black	M	0	1
sand	brown	M	1	16
clay	blue	M	16	38
sand	wht/M	12slt	38	45
clay	blue	M-sticky	45	168
sand	blue	M	168	188
clay	blue		188	202

STATIC WATER LEVEL 63.0 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: 700 gpm

☐ Bailed

☐ Other

Pumping Level Below Land Surface

147.0 Ft. After 19.5 Hrs. pumped 700.0 GPM

Ft. After Hrs. pumped GPM

If pump installed, pump rate: GPM

REMARKS

N45 97 34.7

96 27 45.1

Kris Van Heuveln

RECEIVED
APR 18 2013WATER RIGHTS
PROGRAM

This well was drilled under license # 463 and this report is true and accurate.

Drilling firm: Steffl Drilling & Pump Inc

Signature of License Representative:

Signature of Well Owner or Eligible Property Holder:

Date: 1/19/13

RECEIVED

JUL 15 2013

WATER RIGHTS
PROGRAMNOTICE OF COMPLETION OF WORKS AND
APPLICATION OF WATER TO BENEFICIAL USE

Date

7/12/13

TO: Water Rights Program, DENR
523 E. Capitol
Pierre, SD 57501-3181

FROM:

Roger Schaeffer

(name)

2747 111th Ave.

(address)

Marietta, Mn. 56257 320-668-2532

(city, state, zip)

(phone)

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

Water Permit No. 7541-3 states that the water use system is to be constructed by

6/14/13

(date)

, and water is to be put to beneficial use by

6/15/13

(date)

The water use system was completed on

6/11/13

(date)

Applying the water to beneficial use was completed on

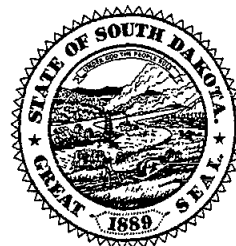
on going started 7/3/13

(date)

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

Roger Schaeffer

(signature)





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
PMB 2020
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3182
<http://denr.sd.gov>

July 16, 2013

7541-3

Roger Schuelke
2747 111th Ave
Marietta MN 56257

Dear Mr. Schuelke:

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

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

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

Sincerely,

A handwritten signature in black ink that reads "Genny McMath". The signature is written in a cursive, flowing style.

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

7541-3

SD EForm - 1621LD V1

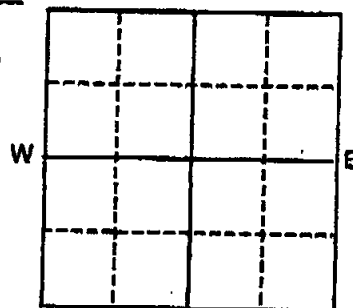
SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NW ¼ SE ¼ Sec 9 Twp 119 Rg 47

County Grant

North

Please mark well
location with an "X"

Well Owner: Roger Schuelke

Business Name:

Address: 2747 11th AVE

City, State, Zip: Marietta MN 56257

WELL LOG:

	FORMATION		DEPTH	
			FROM	TO
top soil	black	M	0	1
sand	brown	M	1	16
clay	blue	M	16	38
sand	wht/M	12slt	38	45
clay	blue	M-sticky	45	168
sand	blue	M	168	188
clay	blue		188	202

Amended 3 17 2014

Well Completion Date

October 23, 2012

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:

mud rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	12.00 IN	0.0 FT	168.0 FT	18.00 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Quick Grout	43	Lb/gal	0 FT	153 FT
Red Flint #60 30		Lb/gal	153.0 FT	188.0 FT

Describe grouting procedure
Tremmy

SCREEN:

☐ Perforated pipe ☒ Manufactured

Diameter 12.00 Inches Length 20.0 Feet

Material stainless steel

Slot Size 60 Set From 168.0 Feet to 188.0 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?Lab to which water
quality sample sent for analysis

STATIC WATER LEVEL

63.0 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: 700 gpm☐ Bailed☐ Other

Pumping Level Below Land Surface

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Ft After Hrs. pumped GPM

If pump installed, pump rate:

GPM

REMARKS

N45 97 34.7

96 27 45.1

Kris Van Heuvlen

RECEIVED

MAR 18 2014

WATER RIGHTS
PROGRAMThis well was drilled under license # 463 and this
report is true and accurate.

Drilling firm: Steffi Drilling & Pump Inc

Signature of License Representative:

Date: 1/19/13

**Report of Examination of Works and/or Application of Water to Beneficial Use
For Permit No. 7541-3**

I have this day, **September 5, 2018**, made a thorough examination of the water use system constructed by **Roger Schuelke** of **2747 111th Ave, Marietta MN 56257** holder of Permit No. **7541-3**, bearing the priority of **November 28, 2012** authorizing the diversion of **2.0** cu. ft. per second of the waters of **ground water (Granite wash Aquifer)** for **irrigation use** purposes, in **Grant** County.

Inspection contact & relationship **Roger Schuelke - Owner**

A. Works used to divert the water:

Well Information:

- 1) Well Drilling Firm: **Steffln Drilling and Pump Inc**
- 2) No. of Wells **1**
- 3) Depth(s) **188** feet
- 4) Well log is available **Y**

Comments: **none**

Casing:

- 1) Diameter **12** inches
- 2) Length **165** feet
- 3) Type **plastic**

Screen:

- 1) Type **stainless steel**
- 2) Length **20** feet
- 3) Static water level **63** feet

Pump:

- 1) Make **NA**
- 2) Model **submersible**
- 3) Size **NA**
- 4) Capacity **700** GPM

Motor:

- 1) Make **NA**
- 2) Model No. **submersible**
- 3) Horsepower rating **60** hp

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

- 1) Type **aluminum**
 - 2) Size **6** inches
 - 3) Length **60** feet
- Comments: **#**

C. Works used to apply water to beneficial use:

Center pivot:

- 1) Make Zimmatic with corner unit
- 2) Overall length 1390 feet
- 3) Number of towers 7
- 4) End gun Y
- 5) Capacity 700 GPM

Chemigation Equipment:

- 1) Does chemigate Y
- 2) Main line check valve Y
- 3) Inspection port/air relief Y
- 4) Low pressure drain Y
- 5) Discharge is 20' from source Y
- 6) Interlock type electrical
- 7) Injection pump type diaphragm
- 8) Injection check valve Y
- 9) Injection line check valve or positive displacement pump Y

Comments: none

D. Compliance with Permit Requirements:

- 1) Permit qualifications being abided by Y

Comments: Perpetual easement agreement is part of this permit file

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

List any extended period of nonuse: none

- 3) Exceptions to compliance are: none

E. Condition and Location:

1. The system is in good condition with the point(s) of diversion located as follows: from SE corner of Sec 9 T119N-R47W, 1,450 ft north & 1,510 ft west; latitude of 45.12625 and longitude of -96.462539, NW ¼ SE ¼ Sec 9 T119N-R47W).
2. The works are capable of diverting and conveying to the place of use 1.56 cu. ft. per second of water which is to be used for irrigation use. Water has been put to beneficial use to the maximum extent as follows: All land is located in Sec 9 T119N-R47W
NW ¼ SE ¼ - 35.5 ac NE ¼ SE ¼ - 35.5 ac SE ¼ SE ¼ - 28.5 ac SW ¼ SE ¼ - 35.5 ac
comprising a total of 135 acres of land and the license should be issued for 1.56 cfs.
3. All structures, wells and lands on map Y
If no, describe: none

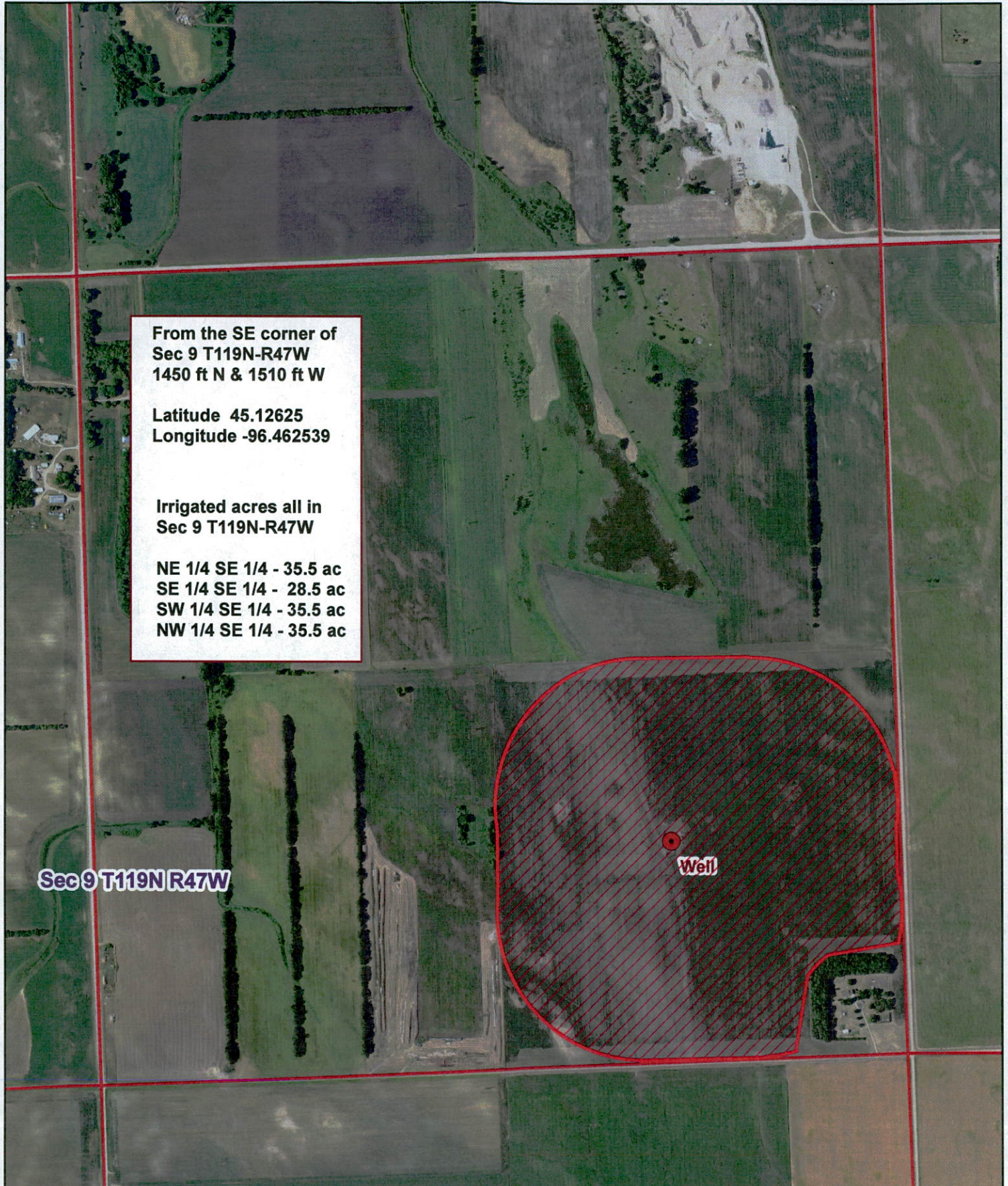
If no, describe: none

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



Mark D Rath
Natural Resources Engineer
DENR, Water Rights Program

Date report completed: 01-04-2019



0 0.125 0.25 0.5 Miles

Mark D Rath

Mark D Rath
Natural Resources Engineer
January 3, 2019



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

MAR 19 2019

7541-3

Roger Schuelke
2747 111th Ave
Marietta MN 56257

Dear Mr. Schuelke:

Enclosed is Water License No. 7541-3. This is the final water right document completing your process of obtaining a Water Right. Included with your license is a map prepared by the staff engineer who conducted the field investigation.

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

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

Sincerely,

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

enclosures

**STATE OF SOUTH DAKOTA
WATER LICENSE NO. 7541-3**

(1) Roger Schuelke, 2747 111th Ave, Marietta MN 56257 made Application No. 7541-3, November 28, 2012 for a water permit to divert 2.00 cubic feet of water per second from ground water, one well (Granite wash Aquifer), Grant County, South Dakota for irrigation purposes. Permit No. 7541-3, with a priority date of November 28, 2012 was approved May 2, 2013 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before May 2, 2018 and for the application to beneficial use of said water on or before May 2, 2022.

(2) It is certified that the permit holder has complied with the provisions of South Dakota State Law relating to completion of the construction of the water supply system and is entitled to divert 1.56 cubic feet of water per second for beneficial use. The location of the diversion point is:

- 1,450'N & 1,510'W of the SE corner of Section 9, T119N, R47W (NW ¼ SE ¼)
Latitude 45.12625, Longitude -96.462539

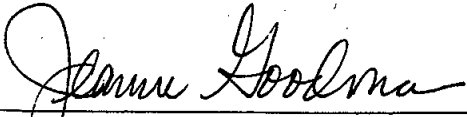
(3) The permit holder has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use to irrigate the following land:

T119N, R47W Section 9	NE ¼ SE ¼	35.5 acres
	SE ¼ SE ¼	28.5 acres
	SW ¼ SE ¼	35.5 acres
	NW ¼ SE ¼	35.5 acres
	Total	135.0 acres

(4) Pursuant to South Dakota Water Law 46-5-30.1 Roger Schuelke, 2747 111th Ave, Marietta MN 56257 the holder and/or owner of Water Right No. 7541-3 is issued a license to appropriate water, the right to use 1.56 cubic feet of water per second from ground water, one well (Granite wash Aquifer) with a priority date of November 28, 2012 from the location specified in (2) of this license for irrigation purposes.

This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Right No. 7541-3 and subject to the following qualifications:

- The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
- This Permit is approved subject to the irrigation water use questionnaire being submitted each year.
- A perpetual easement shall be granted to the State for "Obs-2" completed as part of the aquifer pump test for the purpose of incorporating into the South Dakota Department of Environment and Natural Resources, Water Rights Program Observation Well Network.



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

MAR 19 2019

date



