

WATER PERMIT NO. 6223-3

Name of Applicant: Big Sioux Community Water System, Inc.

Address: PO Box 158, Egan SD 57024 Phone: 605 997-2098

Amount of Water Claimed: 0.74 cfs Total Acres: NA

Source of Water Supply: groundwater

Water to be used for: rural water system use County: Moody

Type of Waste Disposal System:

Location: ½ east of Egan

PRIORITY Date Received: 7-17-2000 Fee: \$50

Corrected Application Received:: Period of Annual Use: January 1 – December 31

Remarks: Additional diversion rate from an additional diversion point (Well #6) . Does not increase the total annual volume appropriated by the water system.

Diversion Point: SE ¼ NE ¼ Sec 7-T106N-R48W

Land to be Irrigated: NA

Depth of Well: 40 feet deep

Well Driller: : Lacey Well Drilling

Remarks:

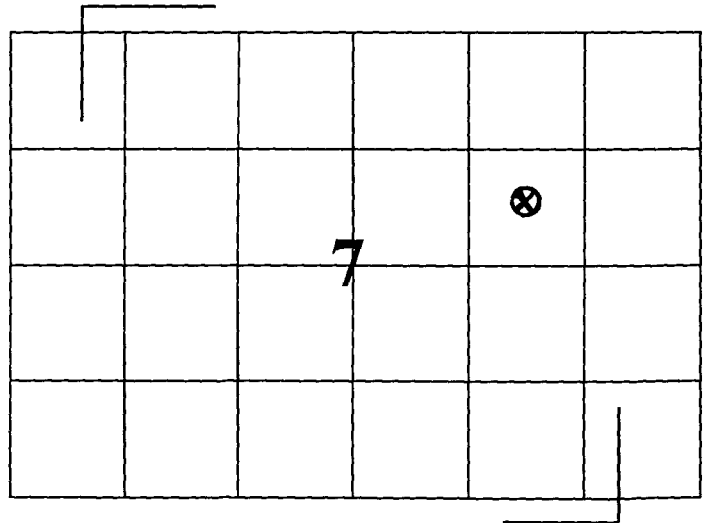
Type of Map: topo

Prepared by: Joel Curran, NRCD

Reviewed and the Number Assigned on: 7-24-2000

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____



SOUTH DAKOTA
WATER PERMIT NO. 6223-3

Date of first receipt of application July 17, 2000.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 6223-3 to Big Sioux Community Water System, Inc., c/o Martin Jarrett, PO Box 158, Egan SD 57024 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. 6223-3 authorizes an additional diversion rate of 0.74 cubic feet of water per second from an additional well (Big Sioux Moody Aquifer) 32 feet deep located in the SE ¼ NE ¼ Section 7-T106N-R48W. This permit does not propose an increase in the total annual volume (1,491 acre-feet) of water appropriated under the Water System's existing water rights. The permit also adds the City of Flandreau to be served by the rural water system.
2. The water appropriated shall be used for the purpose of supplying water to the rural water system and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date of approval of Permit No. 6223-3 is November 9, 2000.
5. The date from which applicant may claim right is July 17, 2000.
6. One-fifth of the construction is to be completed on or before May 9, 2003.
7. All construction is to be completed on or before November 9, 2005.
8. Water is to be put to beneficial use on or before November 9, 2009.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

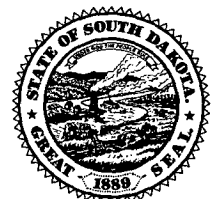
1. The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The well authorized by Permit No. 6223-3 shall be constructed by a licensed well driller and construction shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) from the producing formation to the surface pursuant to Section 74:02:04:28.
3. The Big Sioux Community Water Corporation shall report to the Chief Engineer annually the amount of water withdrawn each year from the Big Sioux:Moody Aquifer.

WATER MANAGEMENT BOARD

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

DEC 12 2000

date



Mail to: Water Rights Program Joe Foss Building 523 E. Capitol Pierre, SD 57501-3181 (605) 773-3352	No. <u>6223-3</u>	(office use only) Hydrologic Unit <u>10170203</u>
	Basin <u>Sioux River</u>	
	Newspaper <u>See list</u>	



Application For Permit To Appropriate Water Within The State Of South Dakota

Check use(s) of water:

☐ Municipal	☐ Suburban Housing	☐ Recreational	☐ Institutional
☒ Rural Water System	☐ Commercial	☐ Fish & Wildlife	☐ Geothermal Heat
☐ Domestic (over 18 gpm)	☐ Industrial	☐ Other	

Type of Application: ☐ New ☐ Vested Right (Use predates Mar 2, 1955) ☐ Future Use Reservation
(check one) ☐ Place to Beneficial Use Water Reserved by Future Use Permit No. _____
☒ Amendment/Correction to Permit No. 2054-3

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.)
Add diversion point, .74 cfs, but with no increase in acre feet under existing permit.
Add City of Flandreau to service area.

1. Name of Applicant Big Sioux Community Water System Inc. Phone (605) 997-2098
(check one) ☒ Owner ☐ Tenant/lessee
Mailing Address PO Box 158, Egan State SD 57024
(Street, RR. or Box) (Zip Code)

2. Amount of water claimed .74 *CFS or **GPM ***AF
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)

3. Source of water supply Big Sioux Aquifer, Moody County.

4. Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)
1 well in SE 1/4 NE 1/4, section 7, T106 N, R.48 W.
County Moody

5. County or counties where water will be used Moody, Lake, Brookings, Minnehaha.

6. Annual period during which water is to be used ~~12 months~~ January 1 - December 31

7. Give a description of the project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)

Project involves hooking up the City of Flandreau. Technical Specs. for well no.6, DGR project no. 649061 is included.

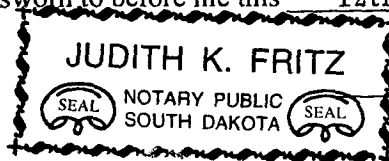
STATE OF SOUTH DAKOTA)
County of Moody SS

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

I, Martin Jarrett, Manager for
Big Sioux Comm. Water Inc. the applicant, certify that I have read this application, have examined the attached map and that the matters stated are true and that I intend, and am able to complete the necessary construction.

Signed [Signature]

Subscribed and sworn to before me this 12th day of July 2000



[Signature]
Notary Public

Supplemental Information

(type or print in ink)



1. Well Information - Proposed Construction

- a) Drill Hole Diameter 20" Depth Approx. 40'
- b) Casing Type Black Steel Diameter 12" Thickness .375
- c) Screen Type Stainless Steel Diameter 12" Thickness 3/16th"
- d) Gravel Pack Quartz Length of Gravel Pack 14'
- e) Depth to Top of Water Bearing Material 7'
- f) Depth to Water (ground surface to water level) 14'
- g) Distance to nearest existing domestic well:

On applicants property 750' to well 5 On property owned by others 7000'

2. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field) _____
- b) System Capacity (gallons) _____ Year Constructed _____
- c) Connected to the City of _____ Sanitary System _____

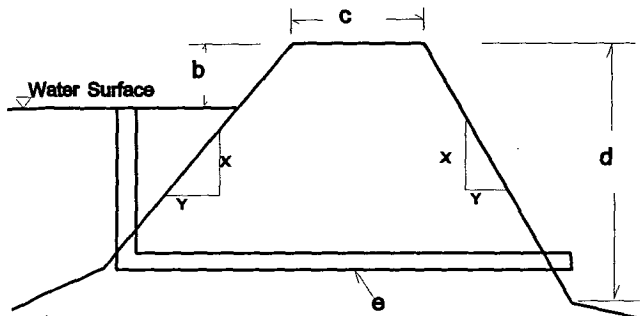
3. Dugout Information

- a) Surface Dimensions _____ Depth _____
- b) Depth to water (ground surface to water level) _____

4. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to be shown on the map submitted with the application.

- a) If a private engineering firm or government agency was involved in the design of this dam, please give their name and address:



- b) Freeboard _____
- c) Crest Width _____
Crest Length _____
- d) Height _____
- e) Primary Outlet Capacity _____
If pipe, diameter _____
- f) Secondary Spillway Capacity _____
Spillway Width _____
- g) X & Y Slope _____
Upstream _____
Downstream _____
- h) Surface Area of Impoundment _____
- i) Storage _____ Acre Feet
- j) Drainage Area Above Dam _____ Acres

In Water Since 1946

Wells — Pumps
Dewatering Work
Test Drilling

LACEY WELL DRILLING
RR 1 - Box 24
Dell Rapids, South Dakota 57022
Telephone (605) 428-5979

Down-Hole Camera
Water Specialists
Irrigation Supplies

Test hole Report

7-7-00

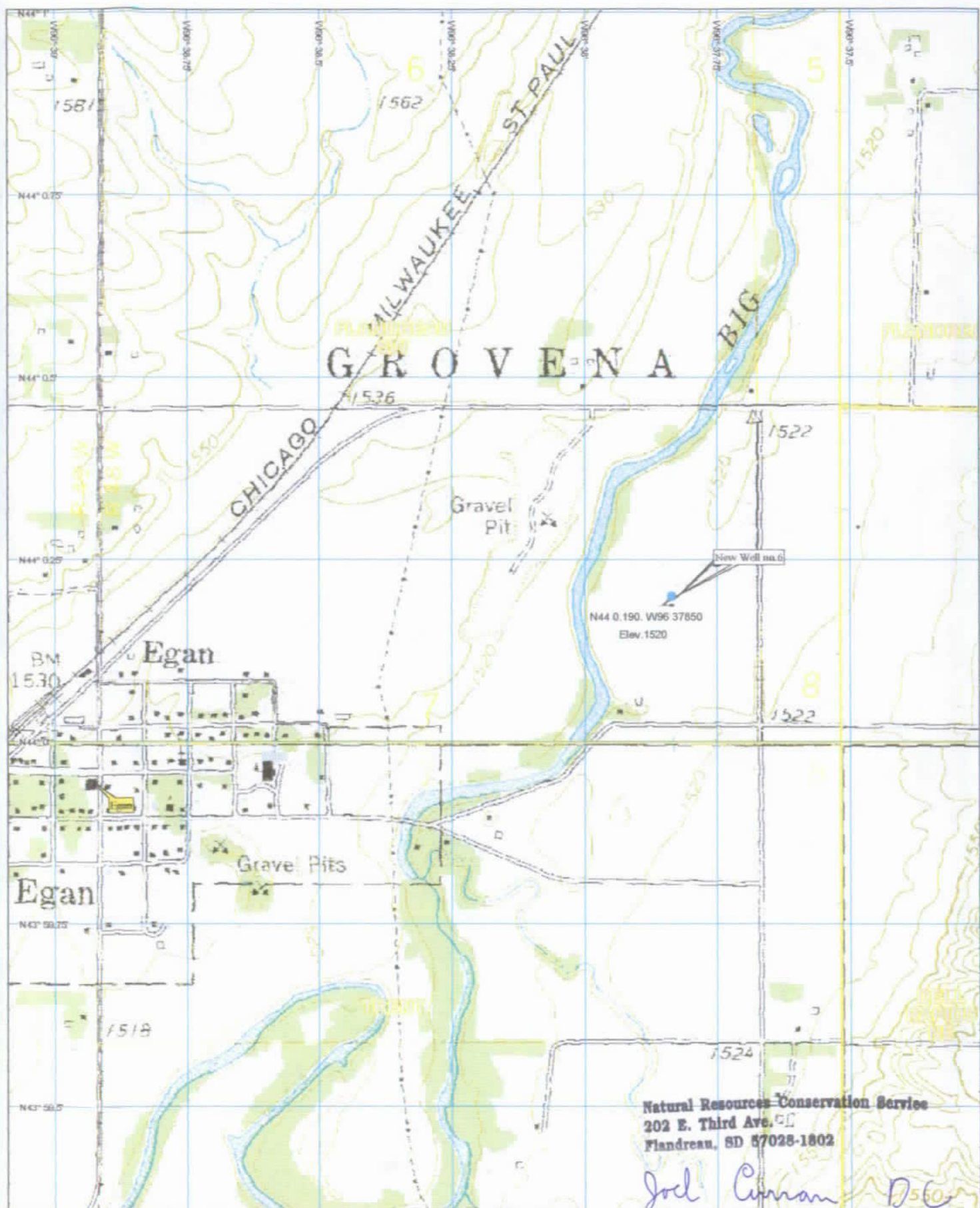
For: Big Sioux PWS
RR3 Box 158
Egan, So. Dak 57024



Test hole on berm:
0-5 Black top Till
5-10 GRAY Till
10-15 Sand
15-32 GRAVEL
32' Blue CLAY
SWL-14'

Drilled by: Lacey Well Drilling
RR1 Box 24
Dell Rapids, So. Dak. 57022

Signed: Jean Redden-Lacey
#SD 111



South Dakota Department of Environment and Natural Resources

Pierre, July 17, 2000

RECEIVED OF Big Sioux Community Water, Inc., P.O. Box 158, Egan, SD 57024-0158
the following amount in fees for services rendered as provided for by law:

By Ma. Cand. E. Valle
Chief Engineer

DGR
DGR
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DGR

**TECHNICAL SPECIFICATIONS
AND DRAWINGS
FOR**



CONSTRUCTION OF WELL NO. 6

BIG SIOUX COMMUNITY WATER SYSTEM

EGAN, SOUTH DAKOTA

June 2000

**DeWild Grant Reckert
and Associates Company**

DGR Project No. 649061

TECHNICAL SPECIFICATIONS
AND
DRAWINGS

FOR

CONSTRUCTION OF WELL NO. 6

BIG SIOUX COMMUNITY WATER SYSTEM
EGAN, SOUTH DAKOTA

June 2000

I hereby certify that this plan, specification
or report was prepared by me or under my direct
supervision and that I am a duly Registered
Professional Engineer under the laws of the
State of South Dakota.

By *Gary J. Patton*
Gary J. Patton, P.E.

Registration No. 3612

Date 6/7/00



DGR Project No. 649061

DEWILD GRANT RECKERT AND ASSOCIATES COMPANY
CONSULTING ENGINEERS
ROCK RAPIDS, IOWA
SIOUX CITY, IOWA
SIOUX FALLS, SOUTH DAKOTA

CONSTRUCTION OF WELL NO. 6

BIG SIOUX COMMUNITY WATER SYSTEM
EGAN, SOUTH DAKOTA

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Observation Well	1
Production Well and Pitless Unit	2

PROPOSAL

Proposal of _____ (hereinafter called "Bidder"), organized and existing under the laws of the State of _____ doing business as* _____.
To the Big Sioux Community Water System (hereinafter called "Owner").

In compliance with your Request for Proposal, BIDDER hereby proposes to perform all WORK for the construction of Well No. 6 in strict accordance with the Technical Specifications and Drawings at the prices stated below.

BIDDER hereby agrees to complete the WORK in accordance with the following schedule within _____ calendar days of the Owner's acceptance of this Proposal.

BIDDER acknowledges receipt of the following ADDENDUM:

* Insert "a corporation", "a partnership", or "an individual" as applicable.

BIDDER agrees to perform all the work described in the Technical Specifications and Drawings for the following unit prices or lump sum:

BID SCHEDULE - WELL CONSTRUCTION

NOTE: BIDS shall include sales tax and all other applicable taxes and fees.

<u>Item No.</u>	<u>No. of Units</u>	<u>Description</u>	<u>Unit Price</u>	<u>Total Cost</u>
1.	1 Ea.	Test drilling mobilization, per ea.	\$_____	\$_____
2.	40 L.F.	Test hole/observation well drilling, including sampling and records, per lin. ft.	\$_____	\$_____
3.	40 L.F.	Completion of test hole as observation well, including screen, casing, gravel pack and seal, per lin. ft.	\$_____	\$_____
4.	1 Ea.	Observation well development, water sample collection and disinfection, per ea.	\$_____	\$_____
5.	1 Ea.	Furnish and install concrete surface seal and protective posts for permanent observation wells, per ea.	\$_____	\$_____
6.	1 Ea.	Production well mobilization, per ea.	\$_____	\$_____
7.	40 L.F.	Production well drilling, including samples and records, per lin. ft.	\$_____	\$_____
8.	30 L.F.	12" Steel casing, per lin. ft.	\$_____	\$_____
9.	10 L.F.	12" Stainless steel screen, per lin. ft.	\$_____	\$_____
10.	20 L.F.	Gravel pack, per lin. ft.	\$_____	\$_____

<u>Item No.</u>	<u>No. of Units</u>	<u>Description</u>	<u>Unit Price</u>	<u>Total Cost</u>
11.	13 L.F.	Cement grout seal, per lin. ft.	\$_____	\$_____
12.	1 Ea.	Production well development, per ea.	\$_____	\$_____
13.	600 L.F.	Installation and removal of temporary discharge piping, per lin. ft.	\$_____	\$_____
14.	1 Ea.	Installation and removal of test pump and equipment, per ea.	\$_____	\$_____
15.	24 Hrs.	Test pumping, observa- tions and records for maximum 24-hr. test, per hr.	\$_____	\$_____
16.	8 Hrs.	Recovery observations and records, per hr.	\$_____	\$_____
17.	1 Ea.	Collection of water samples, disinfection and temporary cap, per well	\$_____	\$_____
18.	1 Ea.	Furnish and install pitless adapter, per ea.	\$_____	\$_____
19.	1 Ea.	Furnish and install submersible pump and motor, per ea.	\$_____	\$_____

TOTAL BID

\$_____

Quantities are not guaranteed. Final payment will be based on actual quantities. Owner may terminate the project at any stage and delete any Bid Items from the project. Payment will be made for completed work at the bid prices without adjustment for deletion of bid items or reduction in quantities.

Respectfully submitted,

Contractor

Address

By _____
Signature

Date

Title

License Number (if applicable)

SEAL - (if BID is by a corporation)

TECHNICAL SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.01 SCOPE:

- A. The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract are hereby made part of this Section.
- B. This Section presents a summary of the Contractor's duties and use of premises.

PART 2 - CONTRACTOR-OWNER RESPONSIBILITIES

2.01 CONTRACTORS' DUTIES:

- A. Except as specifically noted, provide and pay:
 - 1. Labor, materials and equipment.
 - 2. Tools, construction equipment and machinery.
 - 3. Water, heat and utilities required for construction.
 - 4. Other facilities and services necessary for proper execution and completion of Work.
 - 5. All applicable taxes and fees including sales, use and excise taxes.
- B. Secure and pay for, as necessary for proper execution and completion of Work, and as applicable at time of receipt of bids:
 - 1. Permits.
 - 2. Government fees.
 - 3. Licenses.
- C. Give required notices.
- D. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which relate to performance of the Work.
 - 1. Promptly submit written notice to Engineer of observed variance of Contract Documents from legal requirements.

2. Assume responsibility for Work known to be contrary to legal requirements if notice is not submitted.
 3. Necessary changes to the Contract Documents will be accomplished by Change Order if the Contract price or completion time are affected.
- E. Enforce strict discipline and good order among employees. Do not employ on Work:
1. Unfit persons.
 2. Persons not skilled in assigned task.

2.02 CONTRACTOR USE OF PREMISES:

- A. Confine operations at site to areas permitted by:
1. Law.
 2. Ordinances.
 3. Permits.
 4. Contract Documents.
- B. Do not unreasonably encumber site with materials or equipment.
- C. Do not load any structures with weight that will endanger structure.
- D. Assume full responsibility for protection and safekeeping of products stored on premises.
- E. Move any stored products which interfere with operations of Owner or other Contractor.
- F. Obtain and pay for use of additional storage or work areas needed for operations.

2.03 OWNER FURNISHED PRODUCTS:

- A. None.

* * * END OF SECTION * * *

SECTION 01080

APPLICABLE CODES

PART 1 - GENERAL

1.01 CODES AND STANDARDS:

A. Workmanship and materials shall be judged by tests and requirements set forth in the latest revisions of the following codes and standards:

1. American Society for Testing Materials (ASTM).
2. American National Standards Institute (ANSI).
3. American Institute of Steel Construction (AISC).
4. American Concrete Institute (ACI).
5. American Welding Society (AWS).
6. National Electrical Manufacturer's Association (NEMA).
7. National Electrical Code (NEC).
8. American Association of State Highway Transportation Officials (AASHTO).
9. American Water Works Association (AWWA).
10. Uniform Building Code (UBC).
11. South Dakota Well Construction Standards.

* * * END OF SECTION * * *

SECTION 01090

PERMITS, LAWS AND ORDINANCES

PART 1 - GENERAL

1.01 SCOPE:

- A. The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract are hereby made part of this Section.
- B. This Section describes the Contractor's responsibilities pertaining to permits, laws and ordinances.

1.02 PAYMENT:

- A. The requirements of this Section are considered incidental Work with no separate measurement and payment to be made.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 GENERAL:

- A. The Contractor shall comply with all Federal, State, County and local laws, ordinances and rules and regulations relating to the performance of the Work.

3.02 PERMITS:

- A. The Contractor shall, at his expense, procure all permits, certificates, and licenses required of him by law for the execution of his Work.
- B. The Contractor shall be a Licensed Driller under SDCL 46-6-9.

3.03 SPECIAL PERMITS AND OBLIGATIONS REQUIRED OF THE CONTRACTOR:

- A. The Contractor shall, at such times as is necessary, obtain permission from each property owner to trespass through the property owner's improvements.
- B. The Contractor shall obtain permission prior to the cutting of any fences.
- C. All fences are to be repaired as specified in Section 01500 of these specifications.

- D. All gates shall be left in condition found; open or closed. If any doubt arises, gates shall be closed.
- E. All loss of livestock due to negligence shall be the direct responsibility of the Contractor.

* * * END OF SECTION * * *

SECTION 01095

EXISTING UTILITIES AND UNDERGROUND OBSTRUCTIONS

PART 1 - GENERAL

1.01 SCOPE:

- A. This Section describes, but is not limited to, the contact to be made with existing utilities and the Work associated with location, adjustment and repair of underground utilities and obstructions.
- B. The location of underground facilities is not shown on the Drawings.

1.02 PAYMENT:

- A. Repair by the Contractor of any utilities, drain tiles and other underground obstructions damaged by the Contractor's activities is considered incidental Work with no separate measurement and payment to be made.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 GENERAL:

- A. The Contractor shall take all necessary precautions to locate, protect and repair existing utilities, underground obstructions and structures.
- B. The Contractor shall have full responsibility for locating all existing underground facilities affected by construction, for contact with owners of affected underground facilities, for repair or replacement of any underground facilities damaged by the Contractor, and for such other requirements as may be included in the specifications, the cost of all of which will be considered incidental to the Contract Unit Prices or Lump Sum Prices.

3.02 UTILITY REPAIR:

- A. When a utility line or cable is exposed or damaged, the Contractor shall comply with the repair requirements of the affected utility.

* * * END OF SECTION * * *

SECTION 01310

CONSTRUCTION SCHEDULE, CASH FLOW AND PROGRESS REPORT

PART 1 - GENERAL

1.01 SCOPE:

- A. The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract are hereby made part of this Section.
- B. This Section covers the preparation and submittal of:
 - 1. A "Planned Construction Schedule" of the Work.
 - 2. A "Cash Flow Projection."
 - 3. Monthly Progress Reports.
- C. Related requirements specified elsewhere:
 - 1. Summary of Work: Section 01010.

1.02 PAYMENT:

- A. Construction schedule, cash flow and progress report preparation are considered incidental Work with no separate measurement and payment to be made.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 PLANNED CONSTRUCTION SCHEDULE:

- A. Content of Schedule:
 - 1. The sequence of Work.
 - 2. The time of starting and completion of each part of the Work.
 - 3. Coordination requirements. Include delivery of material as well as necessary coordination between other Schedules of Work.
 - 4. Provide the name of the overall job superintendent and the name of the individual responsible (foreman) for individual crews/subcontractors.

5. Relative to crews/subcontractor provide general list of personnel and equipment anticipated.

B. Submittals:

1. Submit the schedule to the Engineer within 10 days after receiving Notice of Award.

- C. The schedule shall be revised whenever actual progress varies by 10% or more and/or a time extension is granted.

3.02 CASH FLOW PROJECTION:

- A. Within 10 days after receiving "Notice of Award," the Contractor shall provide an estimate of cash flow/pay requests consistent with the "Planned Construction Schedule."

* * * END OF SECTION * * *

SECTION 01340

SHOP DRAWINGS, PROJECT DATA AND SAMPLES

PART 1 - GENERAL

1.01 SCOPE:

- A. The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract are hereby made part of this Section.
- B. This Section covers the submission, review and distribution requirements of shop drawings, project data and samples.

1.02 PAYMENT:

- A. Shop drawings, project data and samples are considered incidental Work with no separate measurement and payment to be made.

PART 2 - PRODUCTS

2.01 SHOP DRAWINGS: Original drawings, prepared by Contractor, subcontractor, supplier or distributor, which illustrate some portion of the Work; showing fabrication, layout, setting or erection details.

- A. Prepared by a qualified detailer.
- B. Identify details by reference to specification section or detail number from the Drawings.
- C. Minimum Sheet Size: 8-1/2" x 11".

2.02 PROJECT DATA:

- A. Manufacturer's standard schematic drawings:
 - 1. Modify drawings to delete information which is not applicable to the Work.
 - 2. Supplement standard information to provide additional information applicable to the Work.
- B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.
 - 1. Clearly mark each copy to identify pertinent materials, products or models.

2. Show dimensions and clearances required.
3. Show performance characteristics and capacities.
4. Show wiring diagrams and controls.

PART 3 - EXECUTION

3.01 CONTRACTOR RESPONSIBILITIES:

- A. Review Shop Drawings, Project Data and Samples prior to submission to Engineer for review.
- B. Verify:
 1. Performance criteria.
 2. Field measurements.
 3. Field construction criteria.
 4. Catalog numbers and similar data.
- C. Coordinate the timing of each submittal with requirements of the Work.
- D. Contractor's responsibility for errors and omissions in submittals is not relieved by Engineer's review of submittals.
- E. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Engineer's review of submittals, unless Engineer gives written acceptance of specific deviations.
- F. Notify Engineer, in writing at time of submission, of deviations in submittals from requirements of Contract Documents.
- G. Begin no work which requires submittals until return of submittals with Engineer's stamp and initials or signature indicating review.
- H. After Engineer's review, distribute copies.

3.02 SUBMISSION REQUIREMENTS:

- A. Schedule submissions at least fourteen (14) days before date reviewed submittals will be needed.

- B. Submit six (6) copies of Shop Drawings, Project Data and Samples for review. Three (3) copies will be returned. Should more than three (3) copies be required by the Contractor, additional copies should be submitted.
 - 1. The Contractor may provide a duplicate copy presubmittal for review and comment.
- C. Accompany submittals with transmittal letter, in duplicate, containing:
 - 1. Date.
 - 2. Project title and number.
 - 3. Contractor's name and address.
 - 4. The number of each Shop Drawing, Project Data and Sample submitted.
 - 5. Notification of deviations from Contract-Legal Documents, Specifications and Drawings.
 - 6. Other pertinent data.
- D. Submittals shall include:
 - 1. Date and revision dates.
 - 2. The names of:
 - a. Subcontractor.
 - b. Supplier.
 - c. Manufacturer.
 - d. Separate detailer when pertinent.
 - 3. Identification of product or material.
 - 4. Relation to adjacent structure or materials.
 - 5. Field dimensions, clearly identified as such.
 - 6. Specification section number.
 - 7. Applicable standards, such as ASTM number or Federal Specification.
 - 8. A statement signed by the Contractor that the submittal has been reviewed and meets the requirements except as noted.

3.03 ENGINEER'S DUTIES:

- A. Review and return submittals within ten (10) days of receipt.
- B. Review of separate item does not constitute review of an assembly in which item functions.
- C. Affix stamp and initials or signature certifying review of submittal noting one of the following:
 - 1. No exception taken.
 - 2. Make corrections noted.
 - 3. Revise and resubmit.
 - 4. Submit specified item.
 - 5. Rejected.
- D. Return submittals to Contractor for:
 - 1. Distribution if marked "No exceptions taken" or "Make corrections noted."
 - 2. Resubmittal if marked "Revise and resubmit," "Submit specified item" or "Rejected."

3.04 RESUBMISSION REQUIREMENTS:

- A. Shop Drawings:
 - 1. Revise initial drawings as required and resubmit as specified for initial submittal.
 - 2. Indicate on drawings any changes which have been made other than those requested by Engineer.

* * * END OF SECTION * * *

SECTION 01345

MATERIAL SAMPLES AND RECORDS

PART 1 - GENERAL

1.01 SCOPE:

- A. The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract are hereby made part of this Section.
- B. This Section covers the general requirements for sampling and record keeping to be performed by the Contractor.
- C. Related requirements specified elsewhere:
 - 1. Test Drilling/Observation Wells: Section 02671.
 - 2. Production Wells: Section 02672.
 - 3. Test for Yield and Drawdown: Section 02674.

1.02 PAYMENT:

- A. The collection and submittal of samples and the production and submittal of records are made part of identified unit price bid items and are not included as separate measurement and payment items.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 SCOPE:

- A. This section covers the type and method of material sampling.
 - 1. Drilled geologic formations.
 - 2. Pumped water samples.
- B. This section covers the type, form and number of records to be produced as a result of the Work.
 - 1. Drilling logs and daily reports.
 - 2. Construction details and as-built drawings.
 - 3. Well test observation records.

3.02 SAMPLES REQUIRED AND METHODS:

A. Drilled Material:

1. Method employed shall produce representative samples of the formation(s) encountered.
2. Shall accurately reflect the nature and state of formations encountered.

B. Water Samples:

1. Shall be representative of the water located in the aquifer in which the well is to be finished. Samples shall be clear, with no visible suspended solids.
2. Shall be collected with the approved methods and in the proper containers consistent with the analysis to be conducted.

3.03 NUMBER OF SAMPLES:

A. Material Samples: Two (2) each from each formation encountered and two (2) each at 5 foot intervals in the water bearing formation.

B. Water Samples:

1. Two 1/2-gallon samples from each observation well.
2. Four 1/2-gallon samples during each well test as follows: two (2) 1/2-gallon samples after three hours of pumping, and two (2) 1/2-gallon samples just prior to well shutdown.

C. Additional volumes as directed during the test(s).

D. Contractor shall provide clean plastic containers for water samples. If special containers are required for certain analyses, the Owner will provide them.

E. The Owner will be responsible for delivering the samples to the testing laboratory and for payment of the analysis fees.

3.04 SAMPLING AND CONSTRUCTION RECORDS:

A. General records required (minimum).

1. Well or test hole log.
2. Sample analysis reports.

3. Detailed map of test hole locations.
 4. Pumping test observations.
 5. Daily progress report.
 6. Well construction as-built drawings.
- B. Specific requirements:
1. Well and test hole logs.
 - a. Well identification number and location description.
 - b. Reference point for all depth measurement.
 - c. Depth at which each change of formation occurs.
 - d. Depth at which water was first encountered.
 - e. Identification of the material of which each stratum is composed.
 - f. Sieve analyses of samples taken in the water bearing formation.
 - g. Nominal hole diameter of the well bore.
 - h. Total depth of the completed hole.
 - i. Depth or location of any lost drilling fluids, drilling materials or tools.
 - j. Depth and description of the well casing.
 - k. Description of well screens including diameter, length, material, slot sizes, amount of open area, and location.
 - l. Static water level at completion of well development.
 - m. Name of contracting company and job foreman.
 - n. Date(s) work completed.
 2. Location map of exploratory area.
 - a. North arrow.
 - b. Scale.

- c. Well identification numbers.
 - d. Identification of known reference joints, such as road centerlines, fence lines, bridges, river channels, etc.
- 3. Pumping test records. See Section 02674.
 - 4. Well construction as-built drawings.
 - 5. Other pertinent data as requested by the Engineer.

3.05 STATE REQUIREMENTS:

- A. Submit to State agencies, samples, completion reports and other materials required by State statute and regulations.
- B. At the completion of well installation, the Contractor shall prepare and file well construction records with the Department of Environment and Natural Resources pursuant to ARSD 74:02:04:65.

* * * END OF SECTION * * *

SECTION 01350

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SCOPE:

- A. The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract are hereby made part of this Section.
- B. This Section describes the Contractor's responsibilities regarding the completion of an operation and maintenance manual.
- C. Related requirements specified elsewhere:
 - 1. Shop drawings, Project Data and Samples: Section 01340.

1.02 PAYMENT:

- A. Operation and maintenance data requirements will be considered as incidental Work with no separate measurement or payment to be made.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 GENERAL:

- A. The Contractor shall prepare and furnish three (3) manuals of all equipment specified.
- B. The Manual shall cover the installation, operation and maintenance of all equipment and material including:
 - 1. Complete catalog data.
 - 2. Manufacturer's literature.
 - 3. Parts list.
 - 4. Maintenance instructions.
 - 5. Approved shop drawings.
 - 6. Supplier's name, address and telephone number.

C. All such literature shall be bound under hard cover and submitted to the Engineer for review and transmittal to the Owner.

1. Should modification be required, the bound literature will be returned to the Contractor for modification and resubmittal to the Engineer.

* * * END OF SECTION * * *

SECTION 01500

TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 SCOPE:

- A. The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract are hereby made part of this Section.
- B. This Section describes the temporary facilities to be provided by the Contractor during the Work.

1.02 PAYMENT:

- A. Temporary facilities are considered incidental to the Work with no separate measurement and payment to be made.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 TEMPORARY WATER:

- A. Water which is required for construction, flushing, testing, disinfection and other purposes shall be obtained by the Contractor at no cost to the Owner.

3.02 TEMPORARY ELECTRICAL:

- A. It will be the Contractor's responsibility to provide, obtain and pay for temporary power for construction, test pumping or other purposes as required to perform the Work.

* * * END OF SECTION * * *

SECTION 01710

PROTECTION AND CLEANING

PART 1 - GENERAL

1.01 SCOPE:

- A. The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract are hereby made part of this Section.
- B. This Section describes the Contractor's responsibilities relative to protection and cleanup of the site during initial construction.

1.02 PAYMENT:

- A. Protection and cleaning of the site is considered incidental to the Work with no separate measurement and payment to be made.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 GENERAL:

- A. Except as otherwise provided herein, the Contractor shall protect all structures, pipelines, trees, power lines, shrubbery, lawns and agricultural crops during the progress of this work; shall remove from the site all cuttings, drillings, debris, and unused materials.
- B. Water pumped or released during construction, test pumping, development, or other operations shall be conducted by temporary pipe lines or wood or metal flumes away from the work area to natural drainageways. Flushing or drainage shall not be conducted in such a manner as to cause erosion or flooding of land not owned or controlled by the Owner, except by special permission in writing by the Owner and affected land owner.
- C. The Contractor shall assure that water discharged to any location during construction does not damage the natural environment or wildlife. The Contractor shall be responsible for any environmental damage which results from this activities.

- D. During well construction, disinfection and development activities chemically contaminated and/or highly chlorinated water shall not be discharged to a stream, river or other waterway where danger to aquatic life may occur. Treatment or dechlorination may be necessary prior to discharge.
- E. At all times keep premises free from accumulations of waste material and rubbish.
- F. At the end of each day's work leave construction area in such a condition so as to permit unencumbered access to all private properties in the vicinity.
- G. Upon completion of the work, the site shall be restored as nearly as possible to its original condition, including the replacement, at the Contractor's sole expense, of any facility or landscaping which has been damaged beyond restoration to its original condition or which has been destroyed.

* * * END OF SECTION * * *

SECTION 01760

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 GENERAL:

- A. The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract are hereby made part of this Section.
- B. This Section describes the measurement and payment to be made for completed Work. The Contractor shall accept the compensation, as herein provided, in full payment for:
 - 1. Furnishing all materials, labor, tools and equipment necessary to the completed Work.
 - 2. Performing all Work contemplated and embraced under the contract.
 - 3. Completing the Work according to the Contract Documents.
- C. Related requirements specified elsewhere:
 - 1. Construction Schedule, Cash Flow and Progress Report: Section 01310.

1.02 SUBMITTALS:

- A. The Contractor shall furnish a pay request on completion and the Owner's acceptance of the work.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 MEASUREMENT:

- A. The determination of final quantities of Work performed under the Contract will be made by the Resident Project Representative, based upon the lines, grades, and cross sections given or measurements made by him or his assistants.
 - 1. All items will be computed in the units of the Bid Schedule.

3.02 PAYMENT:

- A. All Work required to complete construction shall be deemed to be included in the unit price or lump sum price items listed in the Contractor's Bid Schedule.
- B. Payment will be made only for materials actually incorporated in the Work.
- C. Neither the payment of any estimate nor of any retained percentage shall relieve the Contractor of any obligation to make good any defective Work or material.

3.03 PAYMENT ITEMS:

- A. Payment items shall be as listed on the Bid Schedule. Measurement of completed work shall be the number of units installed for each unit price item and completion of the entire item for each lump sum item. Payment will be at respective unit or lump sum prices as per the Bid Schedule.
- B. Unit and lump sum prices as listed on the Bid Schedule shall be the full payment for each item as described by the respective sections of the Specifications.
- C. Mobilizations will be paid as ordered by the Owner. Mobilizations in excess of the number bid will be paid only if the Contractor is ordered to stop work for an extended period and then must remobilize to the job site.
- D. Incidental Work: All work for which measurement and payment is not detailed above is considered incidental with no separate measurement or payment to be made.

* * * END OF SECTION * * *

DIVISION 2 - SITE WORK

SECTION 02100

TEST DRILLING AND OBSERVATION WELLS

PART 1 - GENERAL

1.01 SCOPE:

- A. The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract are hereby made part of this Section.
- B. The Contractor shall furnish and install all equipment, materials, labor, and appurtenances required and necessary for:
 - 1. Test drilling, logging, sampling and sieve analyses.
 - 2. Completion of selected test holes as temporary or permanent observation wells.
 - 3. Developing and obtaining a water sample from selected observation wells.
- C. The quantities detailed in the Bid Schedule are estimates.
 - 1. The number, location and depth of test holes and observation wells shall be determined by the Engineer as the project progresses.
 - 2. Changes to the Bid Schedule quantities will be made by Change Order after the final quantities are known.
- D. Related requirements specified elsewhere:
 - 1. Material Samples and Records: Section 01345.
 - 2. Disinfection and Abandonment: Section 02675.

1.02 SUBMITTALS:

- A. Shop drawings of casing and screen.
- B. Material samples and records per Section 01345.
- C. Submit to state agencies required reports and samples.

1.03 LOCATION:

- A. The area of test drilling and well construction is as shown on the Drawings.

- B. The location for test holes and observation wells will be staked by the Engineer.

1.04 COMPETENT WORKMEN:

- A. The Contractor shall employ only competent workmen for the execution of his work and all such work shall be performed under the direct supervision of experienced personnel satisfactorily to the Engineer.

1.05 PAYMENT:

- A. Payment shall be at the Contract unit prices and lump sum prices as shown on the Bid Schedule.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS:

A. Test Holes and Observation Wells:

1. Test holes shall be drilled as field located and to the depth directed by the Engineer. Selected test holes shall be completed as observation wells.
2. Only potable water containing free chlorine residual at the time of use and conveyed in clean sanitary containers or pipelines shall be used for drilling.
3. The observation wells shall be finished to the bottom of the water bearing formation.
4. The completed observation wells shall consist of the following principal items as dimensioned in the Drawings.

a. Bore Hole Diameter:

- (1) Test Holes and Observation Wells: 6 inch minimum diameter.

b. Casing Material:

- (1) Schedule 80 PVC, ASTM Standard F 480 and NSF Std. 14.

c. Screen Material:

- (1) Factory-slotted Schedule 80 PVC, ASTM Standard F 480 and NSF Std. 14, or

- (2) Wire wound stainless steel.
 - d. Gravel packing.
 - e. Grout.
 - f. Development of well and water samples as specified.
 - g. Abandonment if requested by Owner.
5. The Contractor will be required to develop and pump all observation wells and obtain a clean representative water sample from each. Air lift pumping may be used. An observation well which pumps excessive volumes of suspended solids will not be acceptable.

2.02 SCREEN AND FITTING:

A. Materials:

- 1. Slot cut Schedule 80 PVC well screen with PVC cap at bottom or
- 2. Wire wound stainless steel well screen.

B. All sections and connections shall be threaded together, or chemically welded if PVC.

C. Screen Slot Size: To be determined by the Contractor, but in general shall be sized to retain ninety percent (90%) of the particle size of the select gravel packing media, or to retain between thirty percent and fifty percent (30%-50%) of the formation material if the well is naturally developed.

2.03 GRAVEL PACKING MEDIA:

A. If it is determined by the Contractor, from samples of the formation materials, that the observation wells should be gravel packed, the materials used shall comply with these requirements.

B. Gravel Packing Media: Washed gravel which is screened to the gradation best suitable for the maximum development of water from the observation well and which, after development, will result in a finished observation well which does not pump excessive amounts of sand.

C. Add and mix calcium hypochlorite, HTH or equal, 0.50 pounds per cubic yard of gravel, at the time gravel packing media is placed in well.

2.04 BENTONITE GROUT:

- A. Bentonite grout shall be water and a minimum of ten percent by weight of bentonite, with no additives to promote temporary viscosity, and ten percent by weight of either washed sand, cuttings taken from the bore hole, or granular bentonite. High solids bentonite grout, defined as a fluid mixture of water and a minimum of 15 percent by weight of bentonite, with no additives to promote temporary viscosity, may also be used.

2.05 NEAT CEMENT GROUT:

- A. Shall consist of a mixture in the proportion of one (1) bag (94 pounds) of Portland cement (ASTM C150-84a) to not more than 6 gallons of clean water. The cement shall be sulfate resistant, Type III or better.
- B. Type II cement may be used provided two pounds of bentonite are added per sack of cement.

PART 3 - EXECUTION

3.01 SCOPE:

- A. The Contractor shall furnish and install all labor, tools, equipment and material required to drill each test hole and construct each observation well, including all drilling and placing required to construct and install the screen, casing, gravel packing, seal, and including all development work required.
- B. The Contractor shall properly abandon each test hole which is not completed as an observation well.

3.02 DRILLING AND SAMPLING PROCEDURE:

- A. Exploratory Test Holes:
 - 1. Only clear potable water containing a free chlorine residual at the time of use and conveyed in clean sanitary containers or pipelines shall be used in drilling.
 - 2. Accurate material samples shall be collected from each succeeding formation encountered and at every five (5) feet interval in the water bearing formations.

3. Two complete sets of samples are to be collected. Sieve analyses shall be performed on one set of samples and the second set shall be retained by the Contractor for a period of at least sixty (60) days. The Contractor shall dispose of the second set of samples in accordance with instructions from the Engineer.
4. The Contractor shall keep a written log of the formations, giving accurate descriptions of the materials and whether or not they are water-bearing.
5. All drilling fluid loss shall be accurately tabulated during the drilling operation.
6. The Contractor shall electric log the test hole and provide a bore hole resistivity log and spontaneous potential curve.

3.03 DEVELOPMENT OF WELL:

- A. The methods of developing to be used shall be submitted to and approved by the Engineer. The development time considered acceptable for the wells is that time required for the method approved to yield an ample amount of clear and relatively sediment-free water.
- B. Each observation well shall be developed so that the water level in the wells reflects the water level or piezometric surface in the aquifer. This shall be determined by measuring the static water level and then pouring a volume of clear water into the well equivalent to the volume within a five-foot length of the casing. If the water level returns to the initial static level within five minutes, the observation well will be considered open. An observation well which pumps excessive amounts of suspended solids will not be acceptable.

3.04 PROTECTION OF QUALITY OF WATER:

- A. The Contractor shall take such precautions as are necessary or as may be required permanently to prevent contaminated water or water having undesirable physical or chemical characteristics from entering, through the opening made by the Contractor in drilling the well, the stratum in which the well is to be finished.
- B. The Contractor shall also take all necessary precautions during the construction period to prevent contaminated water, gasoline, etc., from entering the well either through the opening or by seepage through the ground surface.

3.05 CORRECTIVE WORK:

- A. In the event that the well becomes contaminated or that water having undesirable physical or chemical characteristics does enter the well due to the neglect of the Contractor, he shall, at his own expense, perform such work or supply such casing, seals, sterilizing agents or other material as may be necessary to eliminate the contamination or stop the flow of the undesirable water.

3.06 TEMPORARY CAPPING:

- A. At all times during the progress of the work, the Contractor shall protect the well in such manner as effective to prevent either tampering with the well or the entrance of foreign matter into it. Upon suspension of the work for any reason, he shall provide and set a substantial screwed, flanged or welded cap satisfactory to the Engineer on the well which shall remain in place until the well is completed.

* * * END OF SECTION * * *

SECTION 02672

PRODUCTION WELLS

PART 1 - GENERAL

1.01 SCOPE:

- A. The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract are hereby made part of this Section.
- B. The Contractor shall furnish and install all equipment, materials, labor, and appurtenances required and necessary for the complete construction of the production well.
- C. The quantities detailed in the Bid Schedule are based on the logs included in the Appendix.
 - 1. The location and depth of wells shall be determined by the Engineer from the test drilling results.
 - 2. Changes to the Bid Schedule quantities will be made by Change Order after the final quantities are known.
- D. Related requirements specified elsewhere:
 - 1. Material Samples and Records: Section 01345.
 - 2. Well Testing for Yield and Drawdown: Section 02674.
 - 3. Disinfection and Abandonment: Section 02675.

1.02 SUBMITTALS:

- A. Shop drawings of screen and casing.
- B. Material samples and records per Section 01345.
- C. Submit to state agencies required reports and samples.

1.03 LOCATION:

- A. The general area of test drilling and well construction is as shown in the Drawings.
- B. Potential well sites will be identified and staked by the Engineer as exploratory test drilling progresses.

1.04 COMPETENT WORKMEN:

- A. The Contractor shall employ only competent workmen for the execution of his work and all such work shall be performed under the direct supervision of experienced personnel satisfactory to the Engineer.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. During loading, transporting and unloading exercise care to prevent damage to materials.
- B. The gravel pack shall be delivered to the well site on approval by the Engineer.
 - 1. The material may be delivered in bags or in bulk.
 - 2. Materials delivered in bags shall be protected from weather until installed.
 - 3. Materials delivered in bulk shall be stored on a surface covered with a 6-mil plastic sheet.
 - 4. Material for the gravel pack that comes in contact with the ground shall not be used, and all material shall be protected from contamination until installed.

1.06 TESTING:

- A. The Contractor shall notify the Engineer of delivery of the gravel pack materials to the site and shall make the materials available for sampling.
- B. Samples may be collected and tested by the Engineer in accordance with AWWA B100, Section 5.
 - 1. Initial sampling and testing shall be done at the Owner's expense.
 - 2. Subsequent sampling and testing required by the failure of initial samples to meet these specifications shall be done at the Contractor's expense.

1.07 PAYMENT:

- A. Payment shall be at the Contract unit prices and lump sum prices as shown on the Bid Schedule.

PART 2 - PRODUCTS

2.01 SCREEN AND FITTINGS:

- A. Reference Standard: AISI Type No. 304, 18-8 stainless steel.
- B. Minimum Wall Thickness: 7 gauge (3/16 inch).
- C. Wire-wound, continuous-slot type stainless steel screen. Johnson or approved equal.
 - 1. Pipe size for gravel pack well.
- D. Bottom Plate: A 3/16 inch thick, 18-8 stainless steel plate shall be securely welded to the bottom of the screen for sealing the bottom of the well.
- E. All sections and connections shall be welded together with full circumferential joints.
- F. Screen Slot Size: To be determined by the Contractor, but in general shall be sized to retain approximately ninety-five percent (95%) of the particle size of the select gravel packing media.

2.02 STANDARD STEEL CASING PIPE:

- A. Material: New black steel pipe, ASTM Specification A53-84a, plain end.
- B. Beveled ends for butt welds.
- C. Minimum wall thickness and weight shall be as follows:

<u>Nominal Casing Diameter</u>	<u>Wall Thickness in Inches</u>	<u>Weight in Pounds per Foot</u>
4	0.237	10.79
5	0.258	14.62
6	0.280	18.97
8	0.322	28.55
10	0.365	40.48
12	0.375	49.56
14	0.375	54.57
16	0.375	62.58

2.03 GRAVEL PACKING MEDIA:

- A. Gravel pack material shall consist basically of washed gravel, 90% to 95% quartz grains. Approved sources are Northern Gravel Co., Muscatine, Iowa and Eau Claire Sand & Gravel Co., Eau Claire, Wisconsin.

B. Specific Gravity:

1. Average specific gravity of not less than 2.5.
2. Not more than 1 percent, by weight, of the material shall have a specific gravity of 2.25 or less.

C. Nonround Pieces: Thin, flat or elongated pieces, the maximum dimension of which exceeds three times the minimum, shall not be in excess of 2 percent, by weight.

D. Acid Solubles: Not more than 5 percent of the gravel shall be soluble in hydrochloric acid.

E. Washed Material: The material shall be washed and free of shale, mica, clay, dirt, loam, and organic impurities of any kind.

F. Iron and Manganese: The material shall contain no iron or manganese in a form or quantity that will adversely affect the well-water supply.

G. Gradation: To be determined by the Contractor, but in general shall be sized as follows:

1. Gravel-pack gradation shall be determined by taking the 50th percentile of the finest aquifer material to be filtered.
2. Gravel pack to formation-sand ratio at the 50th percentile point shall fall within the range of 6:1 to 4:1.
3. Tests for gradation of gravel-pack material shall be in accordance with the method of testing as specified in ASTM C136.

H. Uniformity Coefficient: Shall not exceed 2.5.

I. Distribution Curve: Shall parallel the main part of the formation-sand distribution curve for formation sands having a uniformity coefficient less than 2.5.

2.04 BENTONITE GROUT:

A. Bentonite grout shall be water and a minimum of ten percent by weight of bentonite, with no additives to promote temporary viscosity, and ten percent by weight of either washed sand, cuttings taken from the bore hole, or granular bentonite. High solids bentonite

grout, defined as a fluid mixture of water and a minimum of 15 percent by weight of bentonite, with no additives to promote temporary viscosity, may also be used.

2.05 NEAT CEMENT GROUT:

- A. Shall consist of a mixture in the proportion of one (1) bag (94 pounds) of Portland cement (ASTM C150-84a) to not more than 6 gallons of clean water. The cement shall be sulfate resistant, Type III or better.

PART 3 - EXECUTION

3.01 GENERAL:

- A. Construct wells of the diameter as shown on the Drawings. Depth shall be sufficient to complete the well to the bottom of the water bearing formation as approved by the Engineer.

3.02 WELL DRILLING METHOD:

- A. Production wells shall be drilled by use of the false casing method.
- B. Only clear potable water containing a free chlorine residual at the time of use and conveyed in clean sanitary containers or pipelines shall be used in well construction.

3.03 SCREEN AND CASING INSTALLATION:

- A. The screen shall be installed concentrically in the drill hole, at the bottom of the well.
- B. Steel casing pipe and stainless steel screen shall be rigidly installed and fastened by full circumferential welded joints in accordance with AWWA C206. Butt joints shall be doubled-welded and shall be full-penetration butt welds.
 - 1. Use AWS-ASTM E309 electrodes for welding Type 304 stainless steel to mild steel.
 - 2. Use E 308-15 or E 308-16 electrodes for welding Type 304 stainless steel to Type 304 stainless steel.
- C. All of the described screen and casing shall be centered in the drill hole with suitable centering guides. Centering guide materials shall be the same as the screen or casing they are attached to .

- D. Centering guides shall not be welded directly to the wire wound portion of the screen.

3.04 GRAVEL PACKING:

- A. Following the setting of the casing and attached screen, the annular spaces between the screen and drill hole shall be filled with gravel pack.
- B. The gravel shall be installed through a tremie pipe of 2 inch diameter and raised in lifts no greater than 10 feet at one time. The gravel pack material shall be installed from the bottom of the well continuously upward.
- C. Calcium hypochlorite, HTH or equal, shall be added and mixed with the gravel packing material at the rate of 0.50 pound per cubic yard of material at the time the material is placed in the well.
- D. Install to the dimensions shown on the Drawings.

3.05 GROUTING:

- A. Install grout under pressure by means of a grout pump from the bottom of annular opening upward in one continuous operation.
- B. Shall be commenced without delay upon completion of drilling the well.
- C. Neat cement grout shall be allowed to set a minimum of 12 hours when hi-early cement is used (with steel casings only) or a minimum of 48 hours when regular cement is used, before drilling operations or other work is resumed or test pumping is performed.
- D. Install to the dimensions shown on the Drawings.

3.06 DEVELOPMENT OF WELL:

- A. The Contractor's plan for well development, including a description of equipment, methods and procedures to be used, and an estimate of time required, shall be submitted to the Engineer for review prior to development.
- B. Acceptable Development Methods:
 - 1. High velocity jetting:
 - a. Horizontal water jetting with simultaneous air pumping.

- b. Minimum horizontal jet water velocity 150 ft./sec.
- c. Jet nozzle shall be no more than 1 inch from inside screen surface.
- d. Jet tool shall rotate at 1 rpm.
- e. Jetting shall be at one level not less than 2 minutes, then proceed to the next level not more than 6 inches vertically, from the bottom of the screen to the top. Continuous vertical lift, if used, shall be at the rate of 5 to 15 minutes per foot of screen.
- f. Simultaneous pumping shall be with the intake no more than 5 feet above the jetting tool and at a flow rate of 10 to 20 percent above jetflow rate.
- g. Jet feed water shall be clean, potable, turbidity free water.

2. Surging and pumping or bailing:

- a. Provide a valved or solid surge block.
- b. Begin at the bottom screen section and proceed upward.
- c. Pumping simultaneously with surging may be used.
- d. Bail sand from the well whenever the sand depth reaches 10 percent of screen length.

3. Interrupted overpumping (rawhiding):

- a. Provide a pump capable of pumping rates up to 2 times design capacity.
- b. Conduct development in not less than 5 increments of pumping rates, i.e. 0.25, 0.5, 1, 1.5 and 2 times design capacity.
- c. No check valve or foot valve shall be used on the pump.
- d. Pumping shall be in 5 minute cycles.

C. The Contractor shall furnish all necessary pumps, compressors, high pressure jets, bailers, or other needed equipment and shall develop the well by such approved methods as shall be necessary to give the maximum yield of water per foot of drawdown and extract

from the water bearing formation in the well the maximum practical quantities of sand as may, during the life of the well, be drawn through the screen when the well is pumped under maximum conditions of drawdown, on either a continuous or intermittent basis.

- D. In the event that chemical additives, such as polyphosphates, are required to aid in development of the well through dissolving drilling muds, silts or clays which may have sealed or partially sealed the outer surfaces of the bore hole in the water bearing portion of the aquifer, the Contractor shall furnish and apply same at no additional cost to the Owner.
- E. Well development shall continue until the water from the well runs clear and the sand content is less than or equal to 1.0 ppm, which shall be considered a sand-free condition. The sand content shall be determined by averaging the results of 5 samples collected at the following times during the final pumping test: (1) 15 minutes after start of the test; (2) after 1/4th of the total planned test time has elapsed; (3) after 1/2 of the time has elapsed; (4) after 3/4ths of the time has elapsed; and (5) near the end of the pumping test. The method of sampling and testing for sand content shall be approved by the Engineer.
- F. The completed well shall have an actual efficiency of not less than 70 percent of the theoretical efficiency, based on the pumping test specified in Section 02674. The efficiency shall be calculated by the Engineer using non-equilibrium methods and making due allowance for the actual penetration of the aquifer with the amount of screen installed.
- G. Failure by the Contractor to construct a well with at least the specified efficiency, or to construct a sand-free well, as defined above, will be considered negligence on the part of the Contractor and will result in refusal to accept the well and the associated pumping test by the Owner.

3.07 TESTING FOR PLUMBNESS AND ALIGNMENT:

- A. The Contractor shall furnish all labor, material, equipment and tools required to test the production wells for plumbness and alignment. Test wells shall be considered adequate if the test pump can be installed to the bottom of the well without restriction.

- B. The hole shall be constructed and all casing and liners set round, plumb and true to line as defined herein. To demonstrate the compliance of his work with this requirement the Contractor shall make the tests described herein in the manner prescribed by, and to the satisfaction of, the Engineer.
- C. Tests for alignment and plumbness must be made after the complete construction of the well and before acceptance. Additional tests, however, may be made by the Contractor during the performance of the Work.
- D. Description of Test:
1. Plumbness and alignment shall be tested by lowering into each well to the top of the screen a section of pipe 40 feet long or a dummy of the same length. The outer diameter of the plumb shall not be more than 1/2 inch smaller than the diameter of that part of the casing or hole being tested.
 2. If a dummy is used it shall consist of a rigid spindle with three rings, each ring being 12 inches long. The rings shall be truly cylindrical and shall be spaced one at each end of the dummy and one ring in the center thereof. The central member of the dummy shall be rigid so that it will maintain the alignment of the axes of the rings.
- E. Requirements for Plumbness and Alignment:
1. The plumbness and alignment of the production well shall be corrected by the Contractor at his own expense if:
 - a. The pipe or dummy fails to move freely throughout the length of the casing or hole to the top of the screen. (Requirement for alignment).
 - b. The well varies from the vertical in excess of two-thirds the inside diameter of that part of the well being testing per 100 feet of depth, or beyond limitations of this test. (Requirement for plumbness).
 2. Should the Contractor fail to correct such faulty alignment or plumbness, the Owner may refuse to accept the well.

3. The Owner may waive the requirements of this paragraph for plumbness if all of the following apply:
 - a. The Contractor has exercised all possible care in constructing the well and the defect is due to circumstances beyond his control.
 - b. The utility of the completed well will not be materially affected.
 - c. The cost of remedial measures will be excessive.
4. In no event will be provisions of this paragraph with respect to alignment be waived.

3.08 PROTECTION OF QUALITY OF WATER:

- A. The Contractor shall take such precautions as are necessary or as may be required permanently to prevent contaminated water or water having undesirable physical or chemical characteristics from entering, through the opening made by the Contractor in drilling the well, the stratum from which the well is to draw its supply.
- B. The Contractor shall also take all necessary precautions during the construction period to prevent contaminated water, gasoline, etc., from entering the well either through the opening or by seepage through the ground surface.

3.09 CORRECTIVE WORK:

- A. In the event that the well becomes contaminated or that water having undesirable physical or chemical characteristics does enter the well due to the neglect of the Contractor, he shall, at his own expense, perform such work or supply such casing, seals, sterilizing agents or other material as may be necessary to eliminate the contamination or stop the flow of the undesirable water.

3.10 PROTECTION OF WELL AND TEMPORARY CAPPING:

- A. At all times during the progress of the work, the Contractor shall protect the well in such manner as effective to prevent either tampering with the well or the entrance of foreign matter into it.
- B. The well casing shall extend a minimum of 12 inches above existing grade, or such increased height as necessary to prevent the entrance of surface water.

- C. Upon suspension of the work for any reason, the Contractor shall provide and set a substantial screwed, flanged or welded cap satisfactory to the Engineer on the well which shall remain in place until the permanent equipment and structure is completed or the well is abandoned.

* * * END OF SECTION * * *

SECTION 02674

TEST FOR YIELD AND DRAWDOWN

PART 1 - GENERAL

1.01 SCOPE:

- A. The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract are hereby made part of this Section.
- B. This section describes the materials, equipment and methods to be used in conducting well pumping tests for yield and drawdown.

1.02 PAYMENT:

- A. Payment shall be at the Contract unit prices and lump sum prices as shown on the Bid Schedule.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 SCOPE:

- A. The Contractor shall furnish all labor, materials, equipment and appurtenant items required to conduct and complete the pumping test described herein for each production well.

3.02 GENERAL:

- A. The pumping test on each well will consist of a maximum test duration as indicated in the Bid Schedule. Drawdown and recovery observations shall be made in accordance with the schedule set out herein.
- B. The Contractor shall notify the Engineer after the well has been completely constructed, developed and cleaned out and the depth of the well accurately measured, and shall make the necessary arrangements for conducting the pumping test.
- C. In addition to this test the Engineer may order the Contractor to make additional pumping tests if the test pump fails within the test period or the Contractor neglects to perform proper observations. No payment will be made for the failed test.

- D. All tests shall be run with similar equipment and in a like manner to that hereinafter described. Tests shall be made at least 3 days apart. Additional tests requested by the Engineer because of pump failure during the test period, or due to Contractor negligence, will be at the Contractor's expense.
- E. If conditions are encountered during the test period which indicate that additional data are required, the Engineer may direct that the test pumping continue for a longer period than indicated on the Bid Schedule, however the Contractor shall not be required to repeat the test if the pump fails or for other good cause must be shut down after the period indicated on the Bid Schedule. A corresponding addition to recovery reading time may also be made.
- F. The Engineer may, at any time during the course of the work, direct that the test pumping and/or recovery reading periods be reduced.
- G. Extensions or reductions of the test pumping and recovery periods ordered by the Engineer shall be made with no change in the unit cost.

3.03 TEST PUMP:

- A. The Contractor shall furnish and install necessary pumping equipment required for pumping of the well.
- B. The pump for the production well shall be capable of pumping to the required point of discharge at least 800 gallons per minute, but with satisfactory throttling devices so that the discharge may be reduced to 200 gallons per minute if so directed by the Engineer. The pumping rate(s) shall be determined by the Engineer prior to calibrating the test equipment.
- C. The pumping unit shall be a water lubricated turbine pump complete with prime mover of ample power, controls and appurtenances including all drives, gears and universal shafts and shall be capable of being operated without interruption and at a uniform rate throughout the test.

3.04 AUXILIARY EQUIPMENT:

- A. Temporary discharge piping to a point of discharge as approved by the Engineer.
 - 1. Furnish and install pipe of sufficient size for the pumping rate used.
 - 2. Discharged water shall not be allowed to pond on or near the site of the well.

- B. Furnish and install flow measuring devices approved by the Engineer for accurately measuring the flow of water.
 - 1. Orifice.
 - 2. Calibrated, properly sized water meter.
 - 3. Weir box.
- C. Furnish and install flow control devices.
 - 1. Throttling valve(s) capable of maintaining a constant flow rate.
 - 2. Variation on power source rpm is not approved.
- D. Water level measurement:
 - 1. Contractor shall furnish three (3) water level sounding devices capable of indicating drawdown to the nearest 1/8 inch or 0.01 foot in the pumping well and observation wells.
 - 2. Air lines shall not be used to determine water levels.

3.05 CONSTANT-RATE PUMPING AND RECOVERY TESTS:

- A. The Contractor shall calibrate his test pump so that he knows precisely the rate of flow to be expected throughout the duration of the pumping test. This flow rate shall be held absolutely constant throughout the entire test pumping period.
- B. The Contractor shall furnish sufficient competent personnel to make the necessary observations. The water level in the well and the designated observation wells shall be recorded immediately prior to the start of the pumping test. The schedule of observations shall be as shown below:

(During Pumping and Recovery Period)

Each 1 minute for first 10 minutes.
Each 2 minutes for next 10 minutes.
Each 5 minutes for next 40 minutes.
Each 30 minutes for next 4 hours.
Each 60 minutes for next 19 hours.
Each 6 hours for remainder of test or as directed by the Engineer.

- C. Upon completion of the pumping period the test pump will be stopped and drawdown recovery shall be recorded according to the above schedule.
- D. Each observer shall initial and record the time of each observation, drawdown at said time, and the flow rate on an approved log sheet. In addition to drawdown and recovery readings, the Contractor shall also record the following regarding the test:
 - 1. Type of pump used in the test.
 - 2. Rated horsepower and capacity.
 - 3. Dimensional data as to pump setting, and location of intake with respect to ground level.
 - 4. Distance from well to observation wells.

The original copy of each log sheet shall be delivered to the Engineer upon completion of each test. Copies shall be retained by the Contractor.

3.06 STEP-DRAWDOWN TESTS:

- A. The Contractor shall calibrate his test pump so that he knows precisely the rate of flow to be expected for each step of the pumping test. The flow rate shall be held absolutely constant for the duration of each step of the pumping test.
- B. The Contractor shall furnish sufficient competent personnel to make the necessary observations. The water level in the well shall be recorded immediately prior to the start of each step of the pumping test and shall be recorded each 5 minutes during the pumping and recovery periods.
- C. The step-drawdown test shall consist of several successively higher pumping rates with intermediate recovery periods. Each pumping/recovery step shall be of approximately 1 to 2 hour duration as directed by the Engineer.
- D. Each observer shall initial and record the time of each observation, drawdown at said time, and the flow rate on an approved log sheet. In addition to drawdown and recovery readings, the Contractor shall also record the following regarding the test:
 - 1. Type of pump used in the test.
 - 2. Rated horsepower and capacity.

3. Dimensional data as to pump setting, and location of intake with respect to ground level.

The original copy of each log sheet shall be delivered to the Engineer upon completion of each test. Copies shall be retained by the Contractor.

3.07 REMOVAL OF TEST EQUIPMENT:

- A. Upon instructions received from the Engineer that the pumping test has been satisfactorily completed, the Contractor shall immediately proceed to remove any and all equipment furnished by him for the pumping test.
- B. The Contractor shall remove by bailing, pumping, or other approved methods any sand, stones, or foreign material that may have become deposited in the well.

* * * END OF SECTION * * *

SECTION 02675

DISINFECTION AND ABANDONMENT

PART 1 - GENERAL

1.01 SCOPE:

- A. The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract are hereby made part of this Section.
- B. This Section includes all labor, materials, tools, equipment and related services necessary to disinfect and/or abandon observation wells, test wells and production wells.

1.02 PAYMENT:

- A. Payment shall be at the Contract unit prices and lump sum prices as shown on the Bid Schedule.
- B. Owner may instruct Contractor to abandon a well because of poor water quality, low production, or other reason.
 - 1. The Contractor will receive no compensation for well construction and abandonment if the well has not been completed to the appropriate depth or if the well does not meet the specified requirements for alignment, efficiency or sand-free water production.

PART 2 - PRODUCTS

- A. Disinfecting Agents:
 - 1. Calcium Hypochlorite- 70 percent chlorine.
 - 2. Liquid Sodium Hypochlorite - 12 percent chlorine.
 - 3. Purex, Clorox, etc. - 5.25 percent chlorine.

PART 3 - EXECUTION

3.01 TIME OF DISINFECTION:

- A. After each well has been completely constructed, it shall be thoroughly cleaned of all foreign substances, including tools, timbers, rope, debris of any kind, cement, oil, grease, joint dope and scum.

- B. The casing pipe shall be thoroughly swabbed, using alkalies if necessary, to remove oil, grease, or joint dope.
- C. The well shall then be disinfected with a chlorine solution.

3.02 DISINFECTION METHOD:

- A. The well shall be disinfected in accordance with ARSD 74:02:04:58.1 and as outlined in the "Recommended Procedure for Chlorine Disinfection of Water Wells". Disinfection shall be provided after placement of permanent pumping equipment or after completion of work if a substantial period elapses prior to test pumping or placement of permanent pumping equipment.

3.03 CHLORINE SOLUTION:

- A. The chlorine solution used for disinfecting the well shall be of such volume and strength and shall be so applied that a concentration of at least 200 ppm of chlorine shall be obtained in all parts of the well.

1. Chlorine Compound Required to Dose 100 Feet of Water-Filled Well at 200 ppm

Nominal Casing diameter (inches)	Approx. Volume 100 ft. (gals)	Chlorine Compounds	
		70% HTH Perchloron, etc. (dry weight)*	5.25% Purex Clorox, etc. (liquid measure)
2	16	1 oz	8 ozs
4	65	4 ozs	2-1/4 pts
6	146	8 ozs	5 pts
8	261	12 ozs	8-1/2 pts
10	408	1 lb	1-3/4 gals
12	587	1-1/2 lbs	2-1/2 gals
16	1,044	2-1/2 lbs	4 gals
20	1,632	4 lbs	6-2/3 gals
24	2,350	6 lbs	9-1/3 gals

Note: Liquid sodium hypochlorite in a 12 percent solution is often sold for water and wastewater treatment plant use, as a commercial bleach, or for use with swimming pools. Utilizing a solution of this nature would call for a liquid measure equal to one-half the volumes for 5.25% Purex, Clorox, etc.

*Where a dry chemical is used, it shall be mixed with water to form a chlorine solution prior to placing it into the well, especially when introduced into PVC casings.

- B. Chlorine solution shall be prepared and applied in accordance with the directions of, and to the satisfaction of, the Engineer, and shall remain in the production well for a minimum of 24 hours prior to removal by pumping. The chlorine solution need not be removed from observation wells.
- C. After the above specified chlorination the Contractor shall obtain bacteriological samples from the production wells for analysis. If satisfactory results are not obtained the Contractor will immediately re-chlorinate the well at his own expense and obtain additional bacteriological tests until satisfactory results are obtained.

3.04 REQUIREMENTS FOR DISINFECTION OF PUMPING EQUIPMENT:

- A. In the event that the test pump is to be installed after the well has been disinfected, all interior and exterior parts of the pump and discharge piping coming in contact with the water shall be thoroughly washed with a 10 percent chlorine solution using methods to be approved by the Engineer.

3.05 WELL ABANDONMENT:

- A. In the event that the Contractor fails to sink the well to the depth specified or to such depth as ordered by the Engineer, or should he be required to abandon the well because of loss of tools, negligence, excessive sand production, low efficiency, inadequate plumbness and/or alignment, or for any other cause, he shall at his own expense, fill the abandoned hole and remove any casing and materials installed therein. Salvaged material furnished by the Contractor shall remain his property.

3.06 PERMANENT ABANDONMENT OF WELLS AND BORINGS:

- A. All wells or test holes which are abandoned shall be plugged in accordance with the applicable portion(s) of ARSD 74:02:04:67 through ARSD 74:02:04:69- Requirements for Plugging Wells or Test Holes.

- B. The Contractor is required to prepare and file well and test hole plugging records in accordance with ARSD 74:02:04:71.
- C. A well or boring must be sealed by filling the well or boring, including an open annular space, with grout. The grout must be pumped through a tremie pipe or the casing from the bottom of the well or boring upward to within two feet of the established ground surface or floor. The bottom of the tremie pipe must remain submerged in grout while grouting.
- D. Materials, debris, and obstructions that may interfere with sealing must be removed from the well or boring.
- E. Casing with an open annular space must be:
 - 1. Grouted in place;
 - 2. Removed; or
 - 3. Perforated or ripped. Casing must be either:
 - a. Perforated a minimum of one-half square inch of open area in each foot of casing; or
 - b. Ripped a minimum of five feet for every 20 feet of casing. Casing must be perforated or ripped through the entire length of a confining layer.

If casing is to be removed from a collapsing formation, grout must be inserted so the bottom of the casing remains submerged in grout.

3.07 CLEANUP:

- A. The Contractor shall fill and level the mud pits and shall remove all debris and leave the site in a clean condition satisfactory to the Owner.
- B. Upon completion of the Work, the site shall be restored as nearly as possible to its original condition, including the replacement, at the Contractor's sole expense, of any facility or landscaping which has been damaged beyond restoration.

* * * END OF SECTION * * *

DIVISION 11 - EQUIPMENT

SECTION 11932

SUBMERSIBLE TURBINE PUMPS AND MOTORS

PART 1 - GENERAL

1.01 SCOPE:

- A. The GENERAL, SUPPLEMENTAL and other CONDITIONS of the Contract and the GENERAL REQUIREMENTS (Division 1) are hereby made part of this Section.
- B. This Section includes all labor, materials, tools, equipment and related services necessary to furnish and install the submersible turbine pumps and motors as specified herein and as shown on the Drawings.
- C. Related requirements specified elsewhere:
 - 1. Pitless Adapter: Section 11934.

1.02 SUBMITTALS:

- A. Substitutes to named manufacturer:
 - 1. Submit complete substitute information, including dimensions, descriptive data, and performance data, to Engineer at least ten (10) days prior to bid letting for approval.
 - 2. Contractor shall assume overall undivided responsibility for the functioning of the substitute equipment, including the cost of any changes in connections, appurtenances or structures necessitated by the substitution.
- B. Shop Drawings:
 - 1. Dimensions.
 - 2. Descriptive data.
 - 3. Performance data.
 - 4. Installation instructions.
- C. Provide three (3) copies of operation and maintenance manuals at least 30 days prior to startup.

1.03 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Deliver equipment in manufacturer's original, unopened packaging.
- B. Cover and store equipment indoors to prevent damage.
- C. Handle so as to prevent damage during storage and installation.

1.04 PAYMENT:

- A. Payment shall be at the Contract unit prices and lump sum prices as shown on the Bid Schedule.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS:

- A. Pump specified or noted as submersible turbine shall be vertical, centrifugal, multiple stage turbine type with submersible electric motors.
 - 1. Pump shall be furnished and installed with all accessories necessary for a complete, operating unit.
 - 2. Pump and motor shall be factory assembled in one unit.
 - 3. Driving motor shall be mounted below the pump bowl assembly.
- B. Each unit shall have manufacturer's name, address and catalog or model number permanently marked and readily visible.

2.02 PUMP AND MOTOR CONSTRUCTION FEATURES:

- A. Pump Construction:
 - 1. Pump Bowls:
 - a. Close grained cast iron, ASTM A48, Class 30.
 - b. Porcelain enamel coated.
 - c. Bolted connections using stainless steel bolts.
 - d. Replaceable bronze wear rings.

2. Impellers:
 - a. Enclosed type.
 - b. Bronze, ASTM B584, alloy 836.
 - c. Accurately cast, machined, balanced and filed for optimum performance and minimum vibration.
 - d. Securely fastened to shaft with stainless steel taper collets or lock bushings.
3. Shaft:
 - a. Pump shaft.
 - (1) A 276 Type 410 stainless steel.
 - (2) Rigidly support impellers between bowl bearings.
 - (3) Diameter sufficient to transmit maximum pump horsepower with liberal safety factor.
 - b. Pump shaft bearings:
 - (1) SAE 660 bronze, above and below each impeller.
 - (2) Suction bearing and top discharge case bearing shall be permanently grease packed.
4. Pump Suction:
 - a. Net inlet area minimum of five times the impeller inlet area.
 - b. Screened for maximum opening not more than 75 percent of the minimum opening of the passages through the bowl and impellers opening.
5. Check Valve:
 - a. Install a check valve immediately above the pump.
 - b. Flomatic Model 80 DI with replaceable break-off plug.
 - c. Same size as drop pipe.

B. Motor Construction:

1. Vertical submersible, squirrel cage motor, designed for continuous operation.
 - a. Copper windings.
 - b. 1.15 service factor.
 - c. Power characteristics as specified.
2. Normal starting torque and low starting current for across-the-line starting.
3. The motor shall not be loaded in excess of nameplate rating at any condition of operation from zero flow to maximum pump capacity.
 - a. See pump schedule for maximum horsepower requirements.
4. Water filled with seal to restrict foreign matter from motor.
5. Thrust bearing as integral part of motor.
 - a. Adequate capacity to carry the weight of all rotating parts plus the hydraulic thrust under all flow conditions from zero flow to maximum capacity.
6. A flow inducer sleeve shall be provided to assure proper motor cooling. Sleeve shall extend 6 inches below bottom of motor.
7. Jacketed submersible cable:
 - a. Provide synthetic rubber or plastic insulation suitable for continuous immersion in water around each conductor with a full synthetic rubber or plastic jacket around all four conductors.
 - b. Conductors shall be copper, sized in accordance with motor manufacturers recommendations. Minimum conductor size shall be No. 10 AWG.
 - c. One splice only per conductor at motor leads. No other splices shall be used in the well.
 - d. Protect cable with a steel guard plate where cable passes pump bowls.

- e. Fasten cable to pump column with stainless steel straps not more than 5 feet apart. Use rubber cable protectors at each strap.

C. Accessories:

1. Motor Coupling:

- a. Coupling connecting the motor to the pump bowl assembly shall be of sufficient size and strength to withstand maximum torque generated by the motor plus added safety factor.
- b. Coupling shall be of 410 stainless steel and keyed to the pump shaft.
- c. There shall be incorporated in the pumping unit a positive protection for momentary upthrust.

2. Drop Pipe:

- a. Furnish in random lengths connected by threaded sleeve couplings. Maximum section lengths shall not exceed twenty-one (21) feet.
- b. Pipe shall be Schedule 40 steel, Grade A, ASTM A53.
- c. ASA standard tapered pipe threads.

3. Air Line:

- a. Furnish and install 1/4 inch diameter polyethylene air line from altitude gauge on pitless adapter to top of pump intake.
- b. Securely fasten air line to drop pipe with stainless steel clamps not more than 5 feet on center. Use rubber tubing protectors at each strap.
- c. Protect line with a suitable guard plate where line passes pump bowls.

4. Water Level Stilling Tube:

- a. Furnish and install 1-1/4-inch diameter Schedule 40 PVC line from pitless adapter cap to 3" below bottom of motor to accomplish

water level measurement with an electronic sensing device. Line shall be installed without fittings which would restrict passage of the sensing line.

- b. Securely fasten stilling tube to drop pipe with stainless steel clamps not more than 5 feet on center.
- c. Protect PVC pipe with a suitable guard plate where pipe passes pump bowls.

2.03 PUMP CHARACTERISTICS:

A. Specified pump performance characteristics have been selected to match pumps to all anticipated conditions of flow.

- 1. Pumps shall meet all specified primary and secondary performance requirements.
- 2. Pumps shall be capable of continuous operation without damage at all specified primary and secondary flow rates.
- 3. Performance specified is catalog performance at the pump bowl.
 - a. Flow rate is specified in units of U.S. gallons per minute (gpm).
 - b. Total dynamic head (head) is specified in units of feet of water (ft.), specific gravity 1.0.
 - c. Efficiency is pump bowl catalog efficiency, corrected for the impeller trim and number of stages.

B. Performance Characteristics and Dimensions:

- 1. Well No. 6:

	Flow Rate, <u>gpm</u>	Head, <u>ft.</u>	Minimum Acceptable <u>Efficiency</u>
a. Primary	350	80	77
b. Secondary	400	62	71
c. Maximum acceptable shut-off head	124 feet.		
d. Maximum operating speed	3,500 rpm.		

- e. Franklin submersible motor, 10 horsepower.
- f. Motor electrical power - 3/60/460.
- g. Well casing diameter - 12-inch.
- h. Drop pipe diameter - 6-inch.
- i. Pump setting depth 27' below pitless adapter discharge connection. (Verify setting depth after well depth known.)
- j. Acceptable manufacturers and models:
 - (1) Layne 6 GH, 2-stage.
 - (2) or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install as shown on the Drawings and as per manufacturer's instructions.
- B. All interior and exterior parts of the pump and discharge piping coming in contact with the water shall be thoroughly washed with a 10 percent chlorine solution. Alternatively, the well shall be disinfected after installation in accordance with the instructions of the Engineer.
- C. Check pitless adapter spool and piping for alignment.

3.02 TEST AND ADJUST:

- A. The Contractor shall instruct Owner in operation and maintenance.
- B. The Resident Project Representative or Engineer will test equipment to verify operation within the specified performance characteristics.
 - 1. The Contractor shall repair or replace equipment which does not meet performance specifications.

* * * END OF SECTION * * *

SECTION 11934

PITLESS ADAPTER

PART 1 - GENERAL

1.01 SCOPE:

- A. Work under this Section includes the furnishing of all labor, material, equipment and appurtenances required for the installation of pitless unit to the top of the well casing.
- B. Related requirements specified elsewhere:
 - 1. Submersible Turbine Pump: Section 11932.

1.02 QUALITY ASSURANCE:

- A. Acceptable Manufacturers:
 - 1. Baker-Monitor Division Economy Model or approved equal.

1.03 SUBMITTALS:

- A. Catalog Data: Obtain manufacturer's literature and illustrations.
- B. Shop Drawings:
 - 1. Dimensions.
 - 2. Construction details.
 - 3. Materials.
- C. Installation Instructions: Complete manufacturer's installation instructions.
- D. Maintenance Data:
 - 1. Maintenance instructions.
 - 2. Parts list.
- E. Certificates: Obtain manufacturer's certification that pitless adapters meet or exceed specification requirements.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING:

- A. Store pitless adapters in area protected from weather, moisture, or possible damage.
- B. Do not store materials directly on ground.
- C. Handle items to prevent damage to interior or exterior surfaces.

1.05 PAYMENT:

- A. Payment shall be at the Contract unit prices and lump sum prices as shown on the Bid Schedule.

PART 2 - PRODUCTS

2.01 PITLESS UNIT:

- A. The pitless unit shall provide a watertight, unbroken extension of the well casing and provide a sanitary connection.
- B. The unit shall have the following features:
 - 1. Designed and sized to attach the unit by welding to the well casing.
 - 2. Black steel upper case.
 - 3. A length sufficient to provide a 6-foot bury depth over the discharge connection and to provide the necessary top elevation as shown on the Drawings.
 - 4. A spool support to eliminate vertical adjustment and any possibility of dropping the inner assembly into the well.
 - 5. A watertight cap, sealed with a compression gasket, on top of the unit which may be removed without disconnecting cables or wiring. Cap cast to provide for an air vent and air line assembly.
 - 6. Conduit tapping as required and electrical cable seal.
 - 7. A means of determining water level within the well without removing the cap.
 - a. Equipped with a drawdown line connection for 1/4 inch diameter polyethylene.

- b. Altitude gauge with 3-1/2 inch dial and air pump connection.
 - (1) Gauge range 0 to 60 feet water.
 - 8. A means for introducing an electric water level probe into the well by only removing a 2" plug at the top of the unit.
 - a. Equipped such that 1-1/4-inch diameter Schedule 40 PVC pipe may be permanently installed through the spool for water level sounding.
 - 9. A 2-1/2 inch air vent terminating above the cap in a downward position and covered with 24 mesh bronze screen.
 - 10. Accurately machined water passages and surfaces.
 - 11. A 4-inch lift-out pipe with standard lift-out bail attached to the spool and used to pull the spool out of the pitless unit.
 - 12. Upper pitless case size of 14 inches, O.D., for butt welding to the 12-inch well casing.
 - 13. Spool to drop pipe connection size 6" MIP.
 - 14. Discharge connection, 6" plain end for transition coupling.
- C. The spool shall have the following features:
- 1. Neoprene o-rings between accurately machined hot-dipped galvanized surfaces sealing the spool and permitting withdrawal of the entire assembly by simply lifting out.

PART 3 - EXECUTION

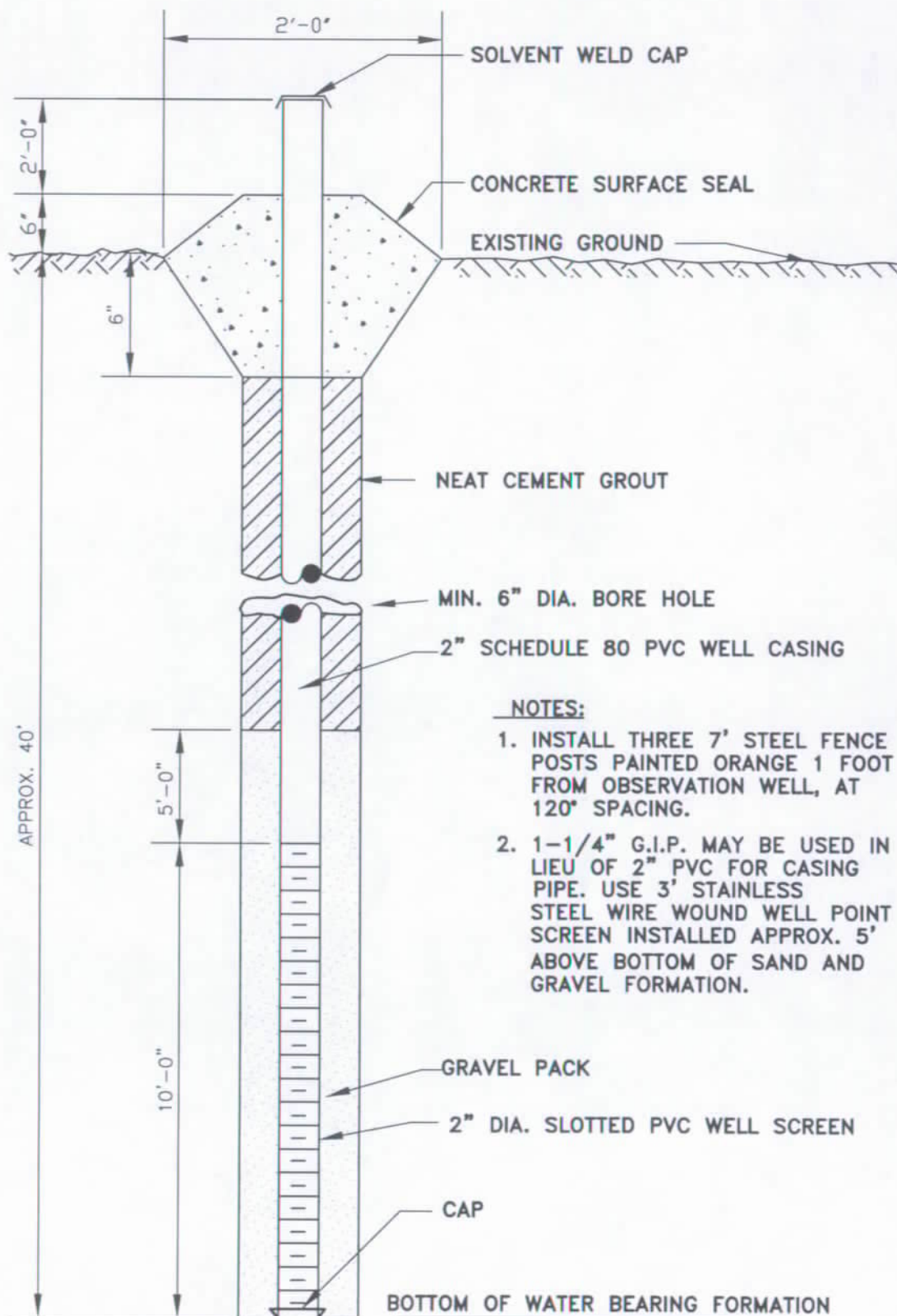
3.01 INSTALLATION:

- A. The area surrounding the existing casing shall be carefully excavated to permit attachment of the unit to the well casing at the depth specified.
- B. The well shall be adequately protected from contamination or entry by foreign materials and surface drainage at all times during installation.
- C. The well casing shall be cut off at the necessary level.

- D. The units shall be attached with full circumferential welded joints in accordance with AWWA C206 and installation completed in strict accordance with the manufacturer's recommendations.
- E. The excavated area shall be filled with suitable clay backfill material and thoroughly tamped in successive layers not exceeding twelve (12) inches.

* * * END OF SECTION * * *

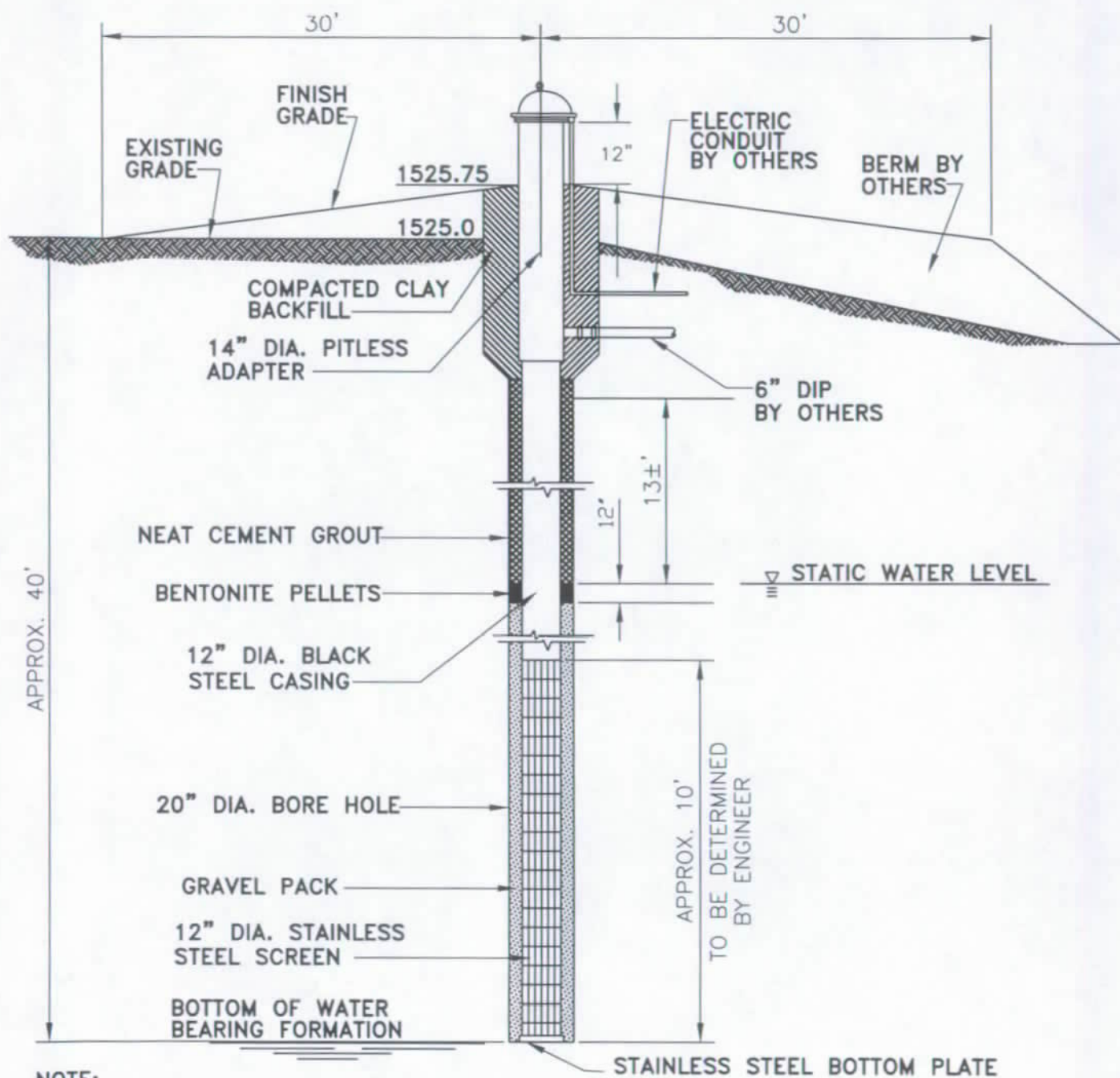
DRAWINGS



NOTES:

1. INSTALL THREE 7' STEEL FENCE POSTS PAINTED ORANGE 1 FOOT FROM OBSERVATION WELL, AT 120° SPACING.
2. 1-1/4" G.I.P. MAY BE USED IN LIEU OF 2" PVC FOR CASING PIPE. USE 3' STAINLESS STEEL WIRE WOUND WELL POINT SCREEN INSTALLED APPROX. 5' ABOVE BOTTOM OF SAND AND GRAVEL FORMATION.

**SECTION VIEW
OBSERVATION WELL**
NOT TO SCALE (49061010)



NOTE:
 SCHEDULE 3 CONTRACTOR TO INSTALL
 PITLESS ADAPTER AND PUMP. TERMINATE
 MOTOR CABLE AT PITLESS CAP. CAP AND
 SEAL PITLESS DISCHARGE.

SECTION VIEW
PRODUCTION WELL AND PITLESS UNIT
 NOT TO SCALE (49061020/49061021)

2



DeWild Grant Reckert and Associates Company
 Consulting Engineers
 Rock Rapids, Iowa
 Sioux City, Iowa
 Sioux Falls, South Dakota

Date JUNE 2000
 Drawn By BH
 Approved GJP
 Revised
 PROJECT NO. 649061
 P:\08\649061\WELLSTD

BIG SIOUX CWS
WELL NO. 6



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

July 10, 2000

Martin Jarrett, Manager
Big Sioux Community Water Corporation
PO Box 158
Egan SD 57024

Dear Martin:

I am writing in response to our phone conversation on July 7, 2000 about construction of an additional well and hooking the City of Flandreau to the rural water system. Enclosed is a set of application forms for your use.

As you requested, here is a brief summary of your water rights and the volume of water that may be diverted from the Big Sioux Moody Aquifer:

Water Right No.	Well No.	Priority	Diversion rate (cfs)	Volume (acre feet)
5963-3	#4	Oct 16, 1996	0.95	240
5962-3	#3	June 6, 1977	0.44	120
2054-3	#1 & #2	Feb 27, 1974	1.16	840 (24 hr/day max)
5720B-3	#5	June 6, 1977	0.67	291
			Total acre-feet	1,491 acre feet

As we discussed, you may include hooking up the City of Flandreau and adding a new well on the same application. If you do not need to increase your annual allowable volume of 1,491 acre feet, then please indicate so on your application. Currently, you have 889 acre feet remaining in reserve under Future Use Permit No. 3984-3 available for appropriation.

Please let me know if you have any questions. I can be reached at (605) 773-3352 and will try to help in any way possible.

Sincerely,

Ron Duvall
Natural Resources Engineer
Water Rights Program

REPORT ON WATER PERMIT APPLICATION NO. 6223-3
for Big Sioux Community Water System, Inc.
August 30, 2000

Application No. 6223-3 proposes an additional diversion rate of 0.74 cfs (332 gpm) from an additional well approximately 40 feet deep located in the SE 1/4 NE 1/4 of section 7, T106N R48W in Moody County. This application does not propose an increase in the total annual volume (1,491 acre feet) of water appropriated under the rural water system's existing water rights/permits. The application also adds the city of Flandreau to be served by the rural water system.

AQUIFER - BIG SIOUX MOODY (BS-M)

The Big Sioux Moody is a surficial outwash (sand and gravel) which is under water table conditions in this area. The aquifer underlies about 42 square miles and contains an estimated 163,000 acre feet of water in storage in Moody County (Hansen, 1986). Ground water movement is from north to south but locally toward the Big Sioux River which acts as a discharge/recharge boundary for the aquifer. The aquifer extends into Brookings County to the north and into Minnehaha County to the south.

Test hole information provided by Lacey Drilling, indicates sand from 10 to 15 feet below land surface and gravel from 15 to 32 feet below land surface. The static water level was reported to be 14 feet below land surface.

The Water Rights Program does monitor observation wells in this area. MY-82E is located about one-half mile north and MY-82F is located about one-half mile south of this application. Water level records for these observation wells indicate the aquifer is capable of sustaining additional withdrawals (Water Rights, 2000). Hydrographs for these two observation wells are included with this reports.

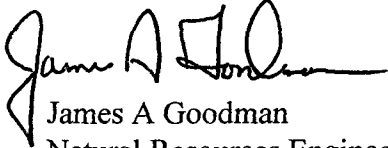
REVIEW OF EXISTING WATER PERMITS/RIGHTS

The only other existing water permits/rights in this area belong to the rural water system. The nearest diversion point (well) from this application is rural water system well #5 which is located about 750 feet south of the proposed well for this application. Interference is not a concern. Drawdown created by pumping should not be significant at the distance between production wells.

CONCLUSIONS

1. Water is available from the Big Sioux Moody aquifer.
2. The aquifer is under water table conditions and pumping is not expected to create significant drawdown. Interference is not a concern.

3. The well authorized by this application must be constructed in accordance with SD Well Construction Standards.
4. This application adds the City of Flandreau to the permitted users of the rural water system.
5. This application is simply a request for an additional well with an additional diversion rate of 0.74 cfs and no additional volume of water beyond the authorized 1,491 acre feet per year.



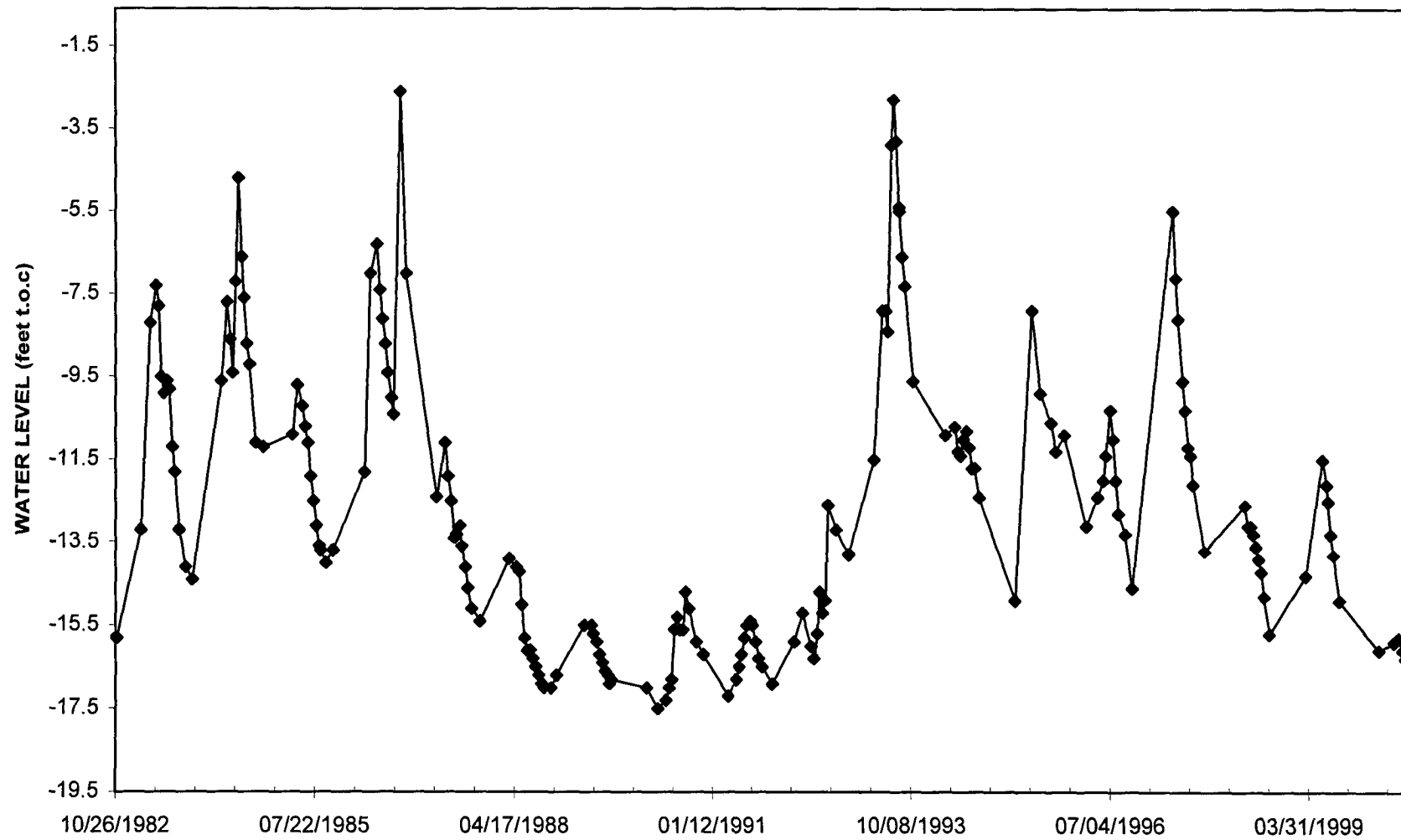
James A Goodman
Natural Resources Engineer

BIBLIOGRAPHY

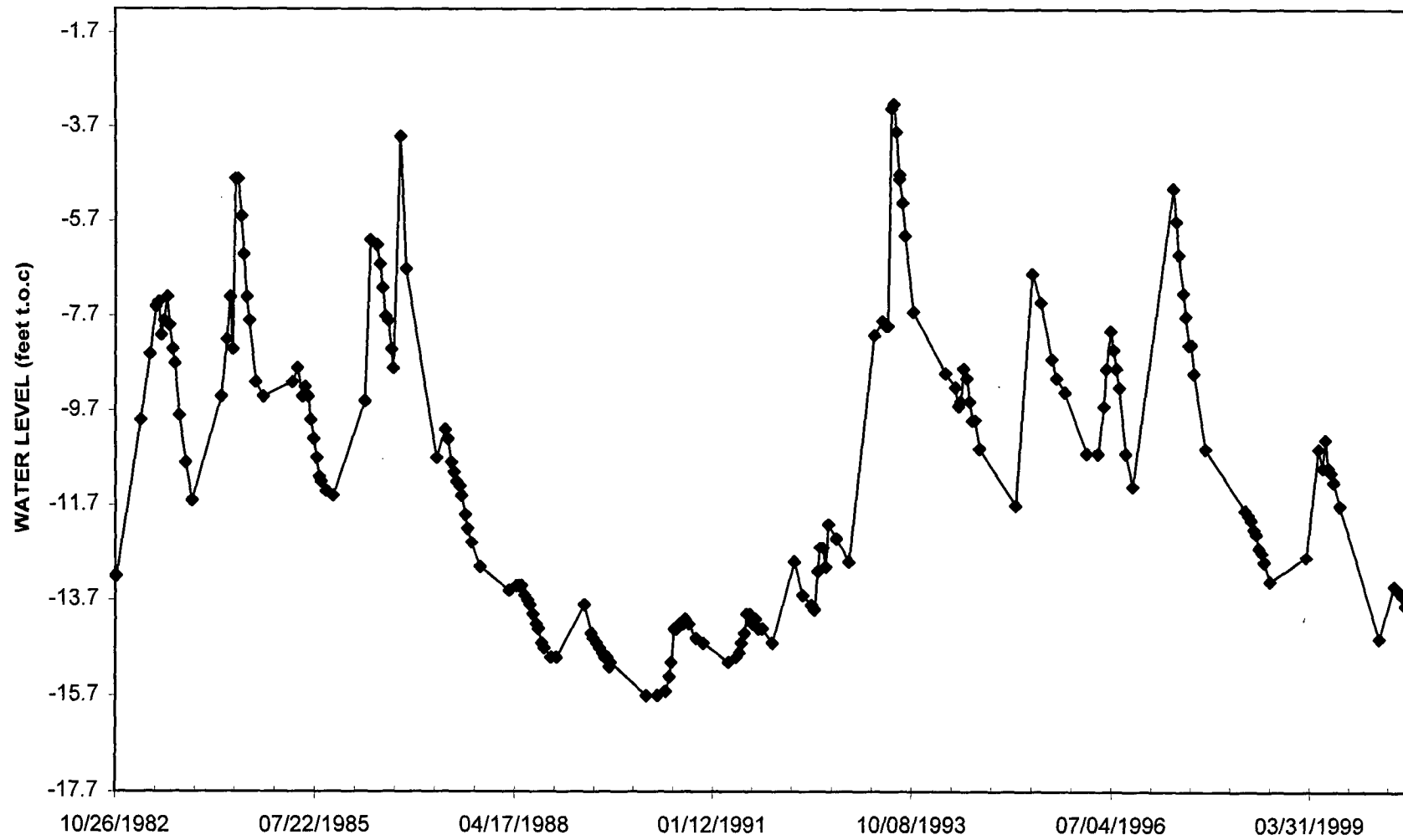
Hansen, D.S., 1986, Water Resources of Lake and Moody Counties, South Dakota, Water-Resources Investigations Report 84-4209, USGS, Huron, SD, 57350.

Water Rights, 2000, Unpublished Observation Well Data for Moody County, SD DENR, DES, Water Rights Program, Pierre, SD, 57501.

WATER RIGHTS' OBSERVATION WELL
MY-82F



WATER RIGHTS' OBSERVATION WELL
MY-82E





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 6223-3, Big Sioux Community Water System, Inc.**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 6223-3, Big Sioux Community Water System, Inc., c/o Martin Jarrett, P.O. Box 158, Eagan, SD 57024.

The Chief Engineer is recommending APPROVAL of Application No. 6223-3 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) it is in the public interest with the following qualifications:

1. The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The well authorized by Permit No. 6223-3 shall be constructed by a licensed well driller and construction shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) from the producing formation to the surface pursuant to Section 74:02:04:28.
3. The Big Sioux Community Water Corporation shall report to the Chief Engineer annually the amount of water withdrawn each year from the Big Sioux:Moody Aquifer.

See report on application for additional information.

Garland Erbele, Chief Engineer
September 6, 2000



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

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

September 7, 2000

Big Sioux Community Water System, Inc.
c/o Martin Jarrett, Manager
PO Box 158
Egan SD 57024

Dear Mr. Jarrett:

Water Permit Application No. 6223-3 for rural water system use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice of hearing has been sent to the following papers:

Moody Co. Enterprise, Flandreau SD	605 997-3194
Daily Leader, Madison SD	605 256-4555
Register, Brookings SD	605 692-6271
Argus Leader SD	605 331-2200

For your information, a copy of the notice, the recommendation of the Chief Engineer and a 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 newspapers to authorize publication of your Notice of Hearing and to arrange for payment. Early contact with the papers can eliminate delays. The publishers have been instructed to publish your notice once each week for two consecutive weeks with the last publication to occur twenty days before the board meeting. The newspapers have 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.



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

September 7, 2000

Argus Leader
PO Box 5034
Sioux Falls SD 57117-2200

ATTENTION: Legal Public Notice

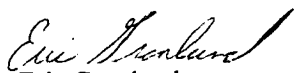
Enclosed is a Notice of Hearing on Application No. 6223-3 to Appropriate Water to be published twice. Please publish the first notice on September 13, 2000 with the second publication 7 days later.

The applicant must verify to you that the notice is to be published, before you make the first publication. **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is Big Sioux Community Water System, Inc., c/o Martin Jarrett, Manager, PO Box 158, Egan SD 57024 (Ph # 605 997-2098).

Please send the Water Rights Program the first publication immediately. The publication is checked for accuracy so any corrections can be made in the second publication. You may use the form below or fax a copy of the first publication. Any fax should be sent to the attention of Karen Schlaak at (605) 773-4068. Publication errors can invalidate the public notice.

After the second publication, **please send us an affidavit or use the enclosed Proof of Publication form.** 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

-----CU T HERE-----

No. 6223-3

TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

Date _____

We are in receipt of your letter of September 7, 2000 enclosing Notice of Hearing to Appropriate Water by Application No. 6223-3 which was first published in our issue of _____. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

Name

Newspaper



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

September 7, 2000

Brookings Register
PO Box 177
Brookings SD 57006-0177

ATTENTION: Legal Public Notice

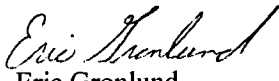
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Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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No. 6223-3

TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

Date _____

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Name

Newspaper



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

September 7, 2000

Daily Leader
PO Box 348
Madison SD 57042-0348

ATTENTION: Legal Public Notice

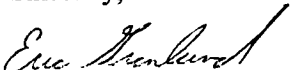
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Natural Resources Engineer
605 773-3352

enclosures

-----CU T HERE-----

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TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

Date _____

We are in receipt of your letter of September 7, 2000 enclosing Notice of Hearing to Appropriate Water by Application No. 6223-3 which was first published in our issue of _____. **ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.**

Name

Newspaper



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/dennr

September 7, 2000

Moody Co. Enterprise
Box 71
Flandreau SD 57028-0071

ATTENTION: Legal Public Notice

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Sincerely,


Eric Gronlund
Natural Resources Engineer
605.773-3352

enclosures

-----CU T HERE-----

No. 6223-3

TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

Date _____

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Name

Newspaper

Instruction to Newspaper - Publish first Notice on September 13, 2000 with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO. 6223-3 to Appropriate Water

Notice is given that Big Sioux Community Water System, Inc., PO Box 158, Egan SD 57024 has filed an application for a water permit for an additional diversion rate of 0.74 cubic feet of water per second from an additional well (Big Sioux Moody Aquifer) 32 feet deep located in the SE ¼ NE ¼ Section 7-T106N-R48W. This application does not propose an increase in the total annual volume (1,491 acre-feet) of water appropriated under the Water System's existing water rights. The application also adds the City of Flandreau to be served by the rural water system.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6223-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by October 2, 2000.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.



PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
) SS
 County of Lake)

I, Deanna D. Bergheim

certify that the attached printed Notice was taken

from the Madison Daily Leader

printed and published in Madison, SD

County of Lake and

state of South Dakota. The notice was published

in the newspaper on the following two dates:

Wednesday, September 13, 2000

Wednesday, September 20, 2000

Cost of Printing 41.33

Deanna D. Bergheim
 (Signature)

Secretary
 (Title)

Sept 20, 2000
 (Date Signed)

NOTICE OF APPLICATION NO. 6223-3

To Appropriate Water

Notice is given that Big Sioux Community Water System, Inc. PO Box 158, Egan SD 57024 has filed an application for a water permit for an additional diversion rate of 0.74 cubic feet of water per second from an additional well (Big Sioux Moody Aquifer) 32 feet deep located in the SE ¼ Section 7-T106N-R48W. This application does not propose an increase in the total annual volume (1,491 acre-feet) of water appropriated under the Water System's existing water rights. The application also adds the City of Flandreau to be served by the rural water system.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6223-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application for the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

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PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
) SS
 County of Moody)

I, Angela Nibbelink

certify that the attached printed Notice was taken

from the Moody County
Enterprise

printed and published in Flandreau

County of Moody and

state of South Dakota. The notice was published

in the newspaper on the following two dates:

Sept. 13, 2000

Sept. 20, 2000

Cost of Printing 42.12

Angela Nibbelink
 (Signature)

Bookkeeper
 (Title)

9-20-00
 (Date Signed)

**NOTICE OF APPLICATION NO. 6223-3
 to Appropriate Water**

Notice is given that Big Sioux Community Water System, Inc., PO Box 158, Egan, SD 57024 has filed an application for a water permit for an additional diversion rate of 0.74 cubic feet of water per second from an additional well (Big Sioux Moody Aquifer) 32 feet deep located in the SE 1/4 NE 1/4 Section 7-T106N-R48W. This application does not propose an increase in the total annual volume (1,491 acre-feet) of water appropriated under the Water System's

existing water rights. The application also adds the City of Flandreau to be served by the rural water system.

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 Department of Environment and Natural Resources

(Sept. 13 & 20, 2000)



AFFIDAVIT OF PUBLICATION-

AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA

COUNTY OF MINNEHAHA } ss

Beth Buchanan being duly sworn, says: That The Argus Leader is, and during all the times hereinafter mentioned was, a daily legal newspaper as defined by SDCL 17-2-21, as amended published at Sioux Falls, Minnehaha County, South Dakota; that affiant is and during all of said times, was an employee of the publisher of such newspaper and has personal knowledge of the facts stated in this affidavit; that the notice, order or advertisement, a printed copy of which is hereto attached, was published in said newspaper upon

Wed	, the	13	day of	September	2000,
Wed	, the	20	day of	September	2000,
	, the		day of		2000,
	, the		day of		2000,
	, the		day of		2000,
	, the		day of		2000,
	, the		day of		2000,

and that \$89.99 was charged for publishing the same including
A \$5.00 affidavit fee.

Beth Buchanan

Subscribed and sworn to before me September 20, 2000.

Joan Stahl

JOAN STAHL



My Commission expires June 30, 2005

NOTICE OF APPLICATION
NO. 6223-3

to Appropriate Water
Notice is given that Big Sioux Community Water System, Inc., PO Box 158, Egan SD 57024 has filed an application for a water permit for an additional diversion rate of 0.74 cubic feet of water per second from an additional well (Big Sioux Moody Aquifer) 32 feet deep located in the SE 1/4 NE 1/4 Section 7-T106N-R48W. This application does not propose an increase in the total annual volume (1,491 acre-feet) of water appropriated under the Water System's existing water rights. The application also adds the City of Flandreau to be served by the rural water system.

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10312 Sept. 13, 20, 2000



Affidavit of Publication

State of South Dakota

ss

County of Brookings



Exhibit "A"

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

Legal #687 Notice of Application No. 6223-3

Brookings and State of South Dakota, for more than one a printed copy of which, taken from the paper in which the same was published, is hereto attached marked Exhibit "A," and is made a part of this affidavit, was published in said newspaper for 2 times, to-wit:

September 13, 2000

September 20, 2000

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

Thirty-eight dollars and fourty-five cents \$38.45

Subscribed and sworn to before me this

11 day of

October

, 2000.

Christina Nelson

Notary Public in and for the County of Brookings, South Dakota.
My Commission expires April 27, 2006

Legal 687, 2x, 9/13, 20

NOTICE OF APPLICATION

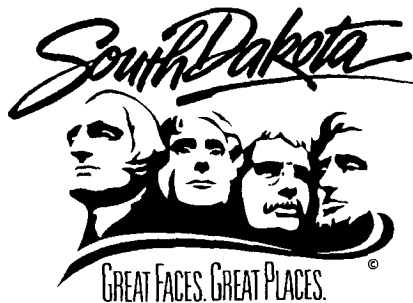
NO. 6223-3 to Appropriate Water

Notice is given that Big Sioux Community Water System, Inc., PO Box 158, Egan SD 57024 has filed an application for a water permit for an additional diversion rate of 0.74 cubic feet of water per second from an additional well (Big Sioux Moody Aquifer) 32 feet deep located in the SE 1/4 NE 1/4 Section 7-T 1, 06N-R48W. This application does not propose an increase in the total annual volume (1,491 acre-feet) of water appropriated under the Water System's existing water rights. The application also adds the City of Flandreau to be served by the rural water system.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6223-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by October 2, 2000.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

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

October 16, 2000

Big Sioux Community Water System, Inc.
c/o Martin Jarrett, Manager
PO Box 158
Egan SD 57024

Dear Mr. Jarrett:

The public notice for Water Permit Application No. 6223-3 was published in 4 papers on September 13 and 20, 2000. The notice published in the Madison Daily Leader contained an error in the legal description of the location of the well. The location was listed as being in the SE $\frac{1}{4}$ Section 7-T106N-R48W. The correct description is the SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 7-T106N-R48W. We did not receive a copy of the first publication from the paper in time to have the correction made in the second publication.

As a result of the error, the notice needs to be readvertised in the Madison Daily Leader (605 256-4555). The readvertisement is needed to ensure the permit is free from legal problems due to inaccurate public notice. Enclosed is a copy of the notice sent to the paper.

Be sure to contact the paper to authorize publication of the Notice and to arrange for payment. It will not be necessary to readvertise in the other 3 papers. Those publications were correct.

Sincerely,


Eric Gronlund
Natural Resources Engineer
(605) 773-3352

enclosures

c: Madison Daily Leader



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

October 16, 2000

Daily Leader
PO Box 348
Madison SD 57042-0348

ATTENTION: Legal Public Notice

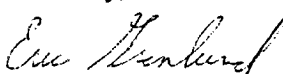
Enclosed is a Notice of Hearing on Application No. 6223-3 to Appropriate Water to be published twice. Please publish the first notice on October 23, 2000 with the second publication 7 days later.

The applicant must verify to you that the notice is to be published, before you make the first publication. The APPLICANT is Big Sioux Community Water System, Inc., c/o Martin Jarrett, Manager, PO Box 158, Egan SD 57024 (Ph # 605 997-2098).

Please send the Water Rights Program the first publication immediately. The publication is checked for accuracy so any corrections can be made in the second publication. You may use the form below or fax a copy of the first publication. Any fax should be sent to the attention of Karen Schlaak at (605) 773-4068. Publication errors can invalidate the public notice.

After the second publication, **please send us an affidavit or use the enclosed Proof of Publication form.** 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

-----CU T HERE-----

No. 6223-3

TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

Date _____

We are in receipt of your letter of October 16, 2000 enclosing Notice of Hearing to Appropriate Water by Application No. 6223-3 which was first published in our issue of _____. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

Name

Newspaper

Instruction to Newspaper - Publish first Notice on October 23, 2000 with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO. 6223-3 to Appropriate Water

Notice is given that Big Sioux Community Water System, Inc., PO Box 158, Egan SD 57024 has filed an application for a water permit for an additional diversion rate of 0.74 cubic feet of water per second from an additional well (Big Sioux Moody Aquifer) 32 feet deep located in the SE ¼ NE ¼ Section 7-T106N-R48W. This application does not propose an increase in the total annual volume (1,491 acre-feet) of water appropriated under the Water System's existing water rights. The application also adds the City of Flandreau to be served by the rural water system.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6223-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by November 9, 2000.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

Mon., Oct., 23,30,2000,

Form 8



NOTICE OF APPLICATION
NO. 6223-3

To Appropriate Water

Notice is given that Big Sioux community Water System, Inc. PO Box 158, Egan SD 57024 has filed an application for a water permit for an additional diversion rate of 0.74 cubic feet of water per second from an additional well (Big Sioux Moody Aquifer) 32 feet deep located in the SE 1/4 NE 1/4 Section 7-T106N-R48W.

This application does not propose an increase in the total annual volume (1,491 acre-feet) of water appropriated under the Water System's existing water rights. The application also adds the City of Flandreau to be served by the rural water system.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6223-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by November 9, 2000.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
) SS
County of Lake)

I, Deanna D. Bergheim

certify that the attached printed Notice was
taken

from the Madison Daily Leader

printed and published in City of Madison

County of Lake and

state of South Dakota. The notice was published

in the newspaper on the following two dates:

Monday, October 23, 2000

Monday, October 30, 2000

Cost of Printing 00.00

Our Error

Deanna D. Bergheim
(Signature)

Secretary
(Title)

10-30-2000
(Date Signed)



DEC 12 2000

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

Big Sioux Community Water System, Inc.
c/o Martin Jarrett
PO Box 158
Egan SD 57024

Dear Mr. Jarrett:

Enclosed is Water Permit No. 6223-3 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

Form 10, *Notice of Completion of Works and Application of Water to Beneficial Use*, is enclosed. Please return this completed form after you have finished the system and have put the water to beneficial use. An investigation can then be scheduled so the water license may be issued, thus completing the acquisition of a water right.

An informational sheet *Common Water Right Questions?* is also enclosed. This sheet is intended to answer some of the questions associated with obtaining and keeping a water right.

Sincerely,

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

enclosures

**NOTICE OF COMPLETION OF WORKS AND
APPLICATION OF WATER TO BENEFICIAL USE**

Date 7/6/2001

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



FROM: Big Sioux Community Water system, Inc.
(name)

PO Box 158

(address)

Egan, South Dakota 57024

(city, state, zip)

(605) 997-2098

(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. 6223-3 states that the water use system is to be constructed by

11/9/2005

(date)

, and water is to be put to beneficial use by 11/9/2009

(date)

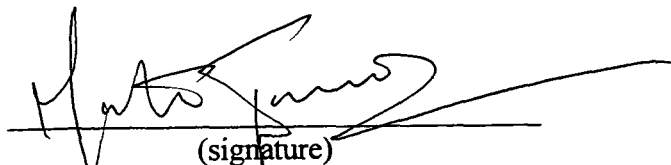
The water use system was completed on 5/1/2001

(date)

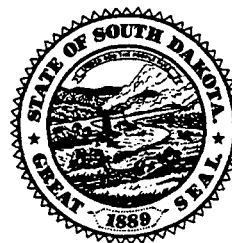
Applying the water to beneficial use was completed on 5/15/2001

(date)

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


(signature)

Martin Jarrett
Manager for Big Sioux Community Water



Mail to: Water Rights Program Joe Foss Building 523 E. Capitol Pierre, SD 57501-3181 (605) 773-3352	(office use only) No. _____ Hydrologic Unit _____
	Basin _____
	Newspaper _____

RECEIVED
MAY 29 2002
WATER RIGHTS
PROGRAM

Application For Permit To Appropriate Water Within The State Of South Dakota

Check use(s) of water:

☐ Municipal	☐ Suburban Housing	☐ Recreational	☐ Institutional
☒ Rural Water System	☐ Commercial	☐ Fish & Wildlife	☐ Geothermal Heat
☐ Domestic (over 18 gpm)	☐ Industrial	☐ Other _____	

Type of Application: ☐ New ☐ Vested Right (Use predates Mar 2, 1955) ☐ Future Use Reservation
(check one) ☐ Place to Beneficial Use Water Reserved by Future Use Permit No. _____
☒ Amendment/Correction to Permit No. 6223-3

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.) Addition of
diversion point (well #7), a mechanical backup, approx. 2300 feet southwest of well #6.
Authorized under SD-46-5-13.1. Well will be designed to pump approx. 330 gpm.

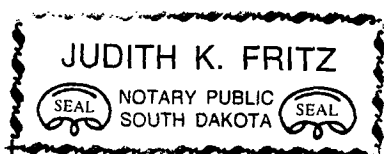
- Name of Applicant Big Sioux Community Water System, Inc. Phone (605) 997-2098
(check one) ☐ Owner ☐ Tenant/lessee
Mailing Address PO Box 158, Egan State SD
(Street, RR. or Box) (Zip Code)
- Amount of water claimed 0 *CFS or **GPM ***AF
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)
- Source of water supply Big Sioux Moody (BS-M)
- Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W) 1 well in the NW 1/4 of
SE 1/4, Section 7, T.106N., R48W., Moody County, South Dakota.
County
- County or counties where water will be used Lake & Moody
- Annual period during which water is to be used January 1st - December 31st.
- Give a description of the project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)

STATE OF SOUTH DAKOTA)
County of Moody) SS

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

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

Signed [Signature]
Subscribed and sworn to before me this 14th day of May 2002



[Signature]
Notary Public
Exp. May 10, 2003

Form 2A Supplemental Information

(Complete applicable portions only)

(type or print in ink)

1. Well Information - Proposed Construction

- a) Drill Hole Diameter 20" Depth 40'
- b) Casing Type Steel Diameter 12" Thickness .375"
- c) Screen Type Stainless Diameter 12" ~~Thickness~~ Length 8-10'
- d) Gravel Pack 6" Length of Gravel Pack 12-14'
- e) Depth to Top of Water Bearing Material 5'
- f) Depth to Water (ground surface to water level) 10'
- g) Distance to nearest existing domestic well:
- On applicants property 2,300 feet On property owned by others 2,600 feet

2. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field) _____
- b) System Capacity (gallons) _____ Year Constructed _____
- c) Connected to the City of _____ Sanitary System _____

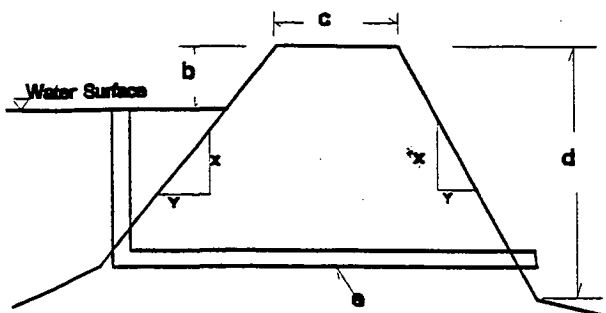
3. Dugout Information

- a) Surface Dimensions _____ Depth _____
- b) Depth to water (ground surface to water level) _____

4. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to be shown on the map submitted with the application.

- a) If a private engineering firm or government agency was involved in the design of this dam, please give their name and address:



- b) Freeboard _____
- c) Crest Width _____
Crest Length _____
- d) Height _____
- e) Primary Outlet Capacity _____
If pipe, diameter _____
- f) Secondary Spillway Capacity _____
Spillway Width _____
- g) X & Y Slope _____
Upstream _____
Downstream _____
- h) Surface Area of Impoundment _____
- i) Storage _____ Acre Feet
- j) Drainage Area Above Dam _____ Acres

In Water Since 1946

Wells — Pumps
Dewatering Work
Test Drilling

LACEY WELL DRILLING
RR 1 - Box 24
Dell Rapids, South Dakota 57022
Telephone (605) 428-5979

Down-Hole Camera
Water Specialists
Irrigation Supplies

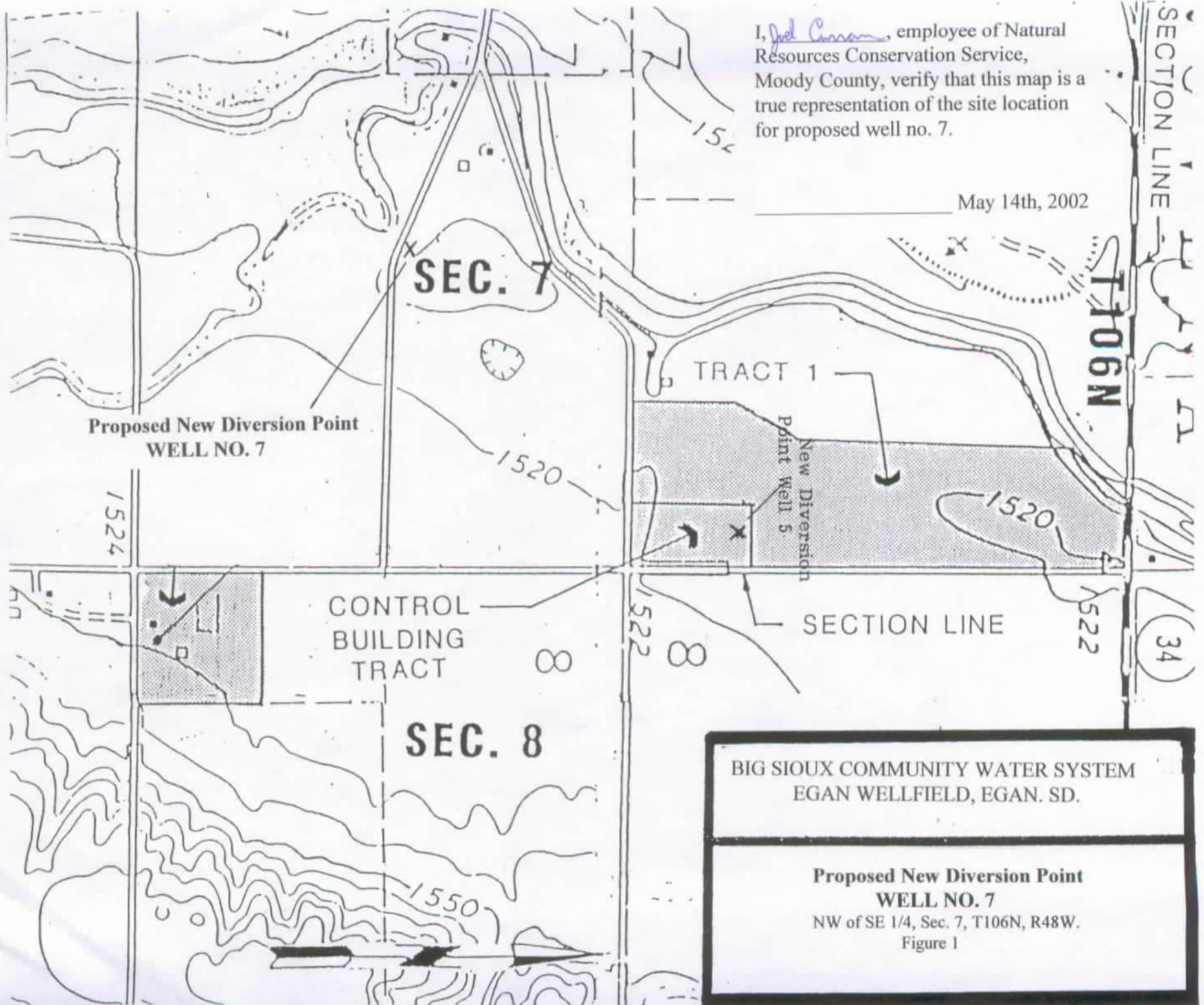
5-20-02

Test log of bore in Egan S.D.
NW4 SE4 SEC 7 106N-48W, Moody Co.
0-4 Topsoil, 4-38 sand & gravel
medium to coarse SWL 10'

Jim Lacey
SD Lic. #111

I, Jed Carson, employee of Natural Resources Conservation Service, Moody County, verify that this map is a true representation of the site location for proposed well no. 7.

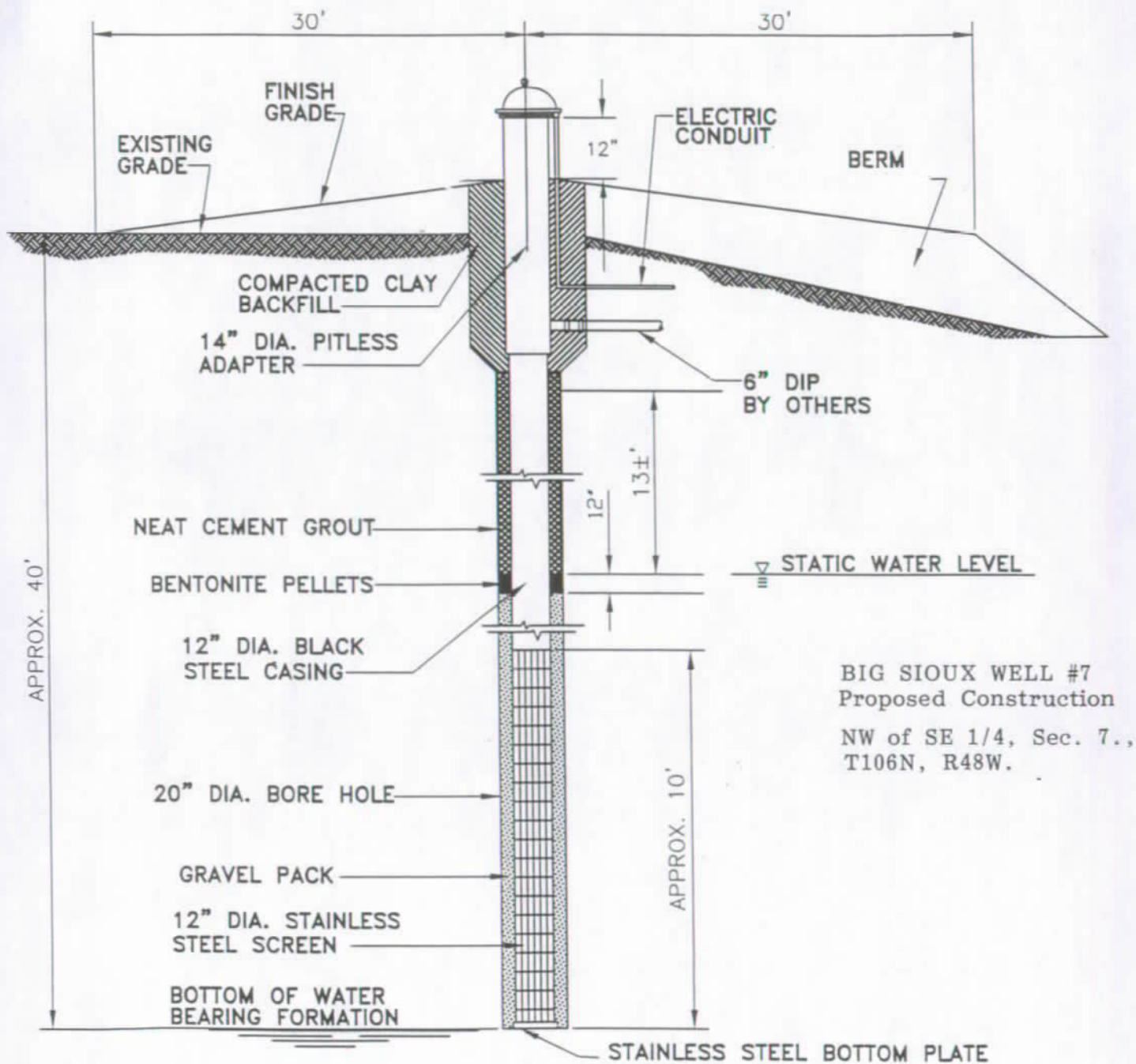
May 14th, 2002



BIG SIOUX COMMUNITY WATER SYSTEM
EGAN WELLFIELD, EGAN. SD.

**Proposed New Diversion Point
WELL NO. 7**

NW of SE 1/4, Sec. 7, T106N, R48W.
Figure 1



BIG SIOUX WELL #7
 Proposed Construction
 NW of SE 1/4, Sec. 7.,
 T106N, R48W.

SECTION VIEW
PRODUCTION WELL AND PITLESS UNIT
 NOT TO SCALE

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
WATER RIGHTS PROGRAM

June 6, 2002

RE: Request for additional diversion point for Water Permit No. 6223-3, Big Sioux Community Water System, Inc.

Big Sioux Community Water System, Inc. has submitted a request for an additional diversion point for Water Permit No. 6223-3. SDCL 46-5-13.1 provides that a point of diversion may be changed or additional points of diversion may be approved without application or publication of a notice of hearing if the additional point of diversion is from the same source of water, no additional water is appropriated and the chief engineer makes a finding that the change does not increase the potential for interference with existing diversions.

Water Right No. 6223-3 appropriates 0.74 cubic feet of water per second from one well constructed into Moody management unit of the Big Sioux Aquifer. This well is located in the SE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 7, T106N, R48W. The permit does not increase the 1,491 acre-feet of water annual volume authorized by the System's existing water rights from this aquifer. Permit No. 6223-3 has a priority date of January July 17, 2000. The rural water system is requesting authorization for an additional well to be constructed approximately 2200 feet southwest of the existing well. No additional appropriation of water is authorized and the well is to be constructed into the same aquifer. A test hole accompanied the System's request which shows a well depth of 38 feet.

Martin Jarrett, Manager of the Big Sioux Community Water System, indicates that this additional well is intended to be a backup well and that no increase in the authorized diversion rate or annual volume is requested.

As part of the review of this request for the additional diversion point, a review of the well log database maintained by the Water Rights Program and existing water rights located in the sections surrounding Section 7. There are two existing water rights, excluding those held by the rural water system, that appropriate 3.67 cfs in this vicinity that obtain water from the same aquifer.

The review of domestic well logs on file with the Water Rights Program was also conducted on the sections surrounding Section 7. This search of the database found 2 domestic well completion reports found in a mile proximity. These wells divert relatively small quantities of water. There may be other domestic wells in the area that are not of file with the Water Rights Program. There have been no recent complaints on water availability from the Moody management unit of the Big Sioux Aquifer.area.

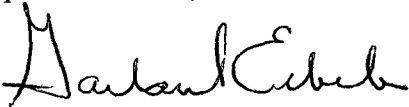
There is an observation well (MY-82F) located in the SE corner of Section 7. Readings from this observation well have been in place since 1982. Generally, static water levels range in the 11 to 16 feet below ground level.

Big Sioux Community Water System's request proposes no additional appropriation of water. This request is for an additional well that is located approximately 2,200 feet southwest of the original well. The new well will be a backup well to the existing well to add reliability to the system. It is not anticipated that domestic uses or existing prior rights will be adversely impacted by authorizing this additional diversion point.



Eric Gronlund
Natural Resources Engineer
Water Rights Program

The Chief Engineer makes a finding that the additional diversion point does not increase the potential for interference with existing diversions. In making the finding, "does not increase the potential for interference" is interpreted to mean potential for adverse interference. The additional diversion point for Water Right No. 6223-3 is authorized without requiring application or publication of a notice of hearing pursuant to SDCL 46-2A-4. A new water right permit is necessary for any diversion greater than 332 gpm by the Big Sioux Community Water System from the two wells or if the System's diversions from the aquifer exceed 1,491 acre feet annually.



Garland Erbele, Chief Engineer
Water Rights Program
June 11, 2002



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

June 12, 2002

Martin Jarrett, Manager
Big Sioux Community Water System, Inc.
Box 158
Egan SD 57024

Dear Mr. Jarrett:

I am writing in regard to the Big Sioux Community Water System's request for additional diversion points under Water Right No. 4943-3 and Water Permit Nos. 6152-3 and 6223-3.

Specifically, Big Sioux Community Water System has requested the following:

Water Right No. 4943-3 appropriates 0.44 cfs from one well (designated Well No. 1) constructed into the North Skunk Creek management Unit of the Big Sioux Aquifer. The request is to authorize an additional well (Well No. 3) which is located approximately 600 feet south of the existing well. The new well will be the primary well while Well No. 1 will be maintained for backup purposes.

Water Permit No. 6152-3 appropriates 0.5 cfs from one well (designated Well No. 2) constructed into the North Skunk Creek management Unit of the Big Sioux Aquifer. The System requests authorization to construct up to two additional wells in order to obtain the 0.50 cfs authorized by Permit No. 6152-3 and to act as a backup to the existing well.

Water Permit No. 6223-3 appropriates 0.74 cfs from one well constructed into the Moody management unit of the Big Sioux Aquifer. This permit does not increase the 1,491 acre feet of water annual volume authorized by the System's existing water rights from this aquifer. The additional well that is requested is to be a backup well. No increase in the diversion rate or annual volume of water is being requested.

Upon review of the request and pursuant to SDCL 46-5-13.1, Big Sioux Community Water System is authorized to construct the additional diversion points without application or publication of a notice of hearing pursuant to SDCL 46-2A-4.

It is our understanding that these additional wells are necessary to bring the production capabilities to the permitted amount or will act as mechanical back-ups to the existing wells. A new water right permit will be necessary if there is an increase in the permitted diversion rates or annual volume of water as authorized by the System's existing water rights.

This request has been authorized under SDCL 46-5-13.1 for which there is no application filing fee.

If you have any questions, please feel free to contact Eric Gronlund at (605) 773-3352.

Sincerely,

A handwritten signature in black ink, appearing to read "Garland Erbele". The signature is fluid and cursive, with the first name "Garland" and last name "Erbele" clearly distinguishable.

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



6223-3

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

April 16, 2010

Martin Jarrett
Manager Big Sioux Community Water
23343 479th NE
Egan, SD 57024-0158

Dear Martin:

Big Sioux Community Water presently holds water rights and water permits authorizing a diversion rate of 3.96 cfs from six wells and an annual volume of 1,491 acre-feet from their Egan Well Field. Groundwater availability is not a concern from the Big Sioux aquifer in your area. Recharge to the aquifer is sufficient to sustain withdrawals. The Water Rights Program of the Department of Environment and Natural Resources continues to recommend approval of new Water Permit applications for water from the Big Sioux aquifer. Big Sioux Community Water has the diversion capacity and volume of water available to do geothermal heating and cooling at their facility.

Existing pumping does not cause significant drawdown in this area of the aquifer. There have never been any complaints concerning water availability in this area and it is anticipated this use will not change that fact.

If there are any questions or concerns please let me know.

Sincerely,

James A Goodman, PE
Natural Resources Engineering Director
605-773-3352

Mr. Josh Marceau
Project Monitor
1617 Cole Blvd.
Golden, CO 80401

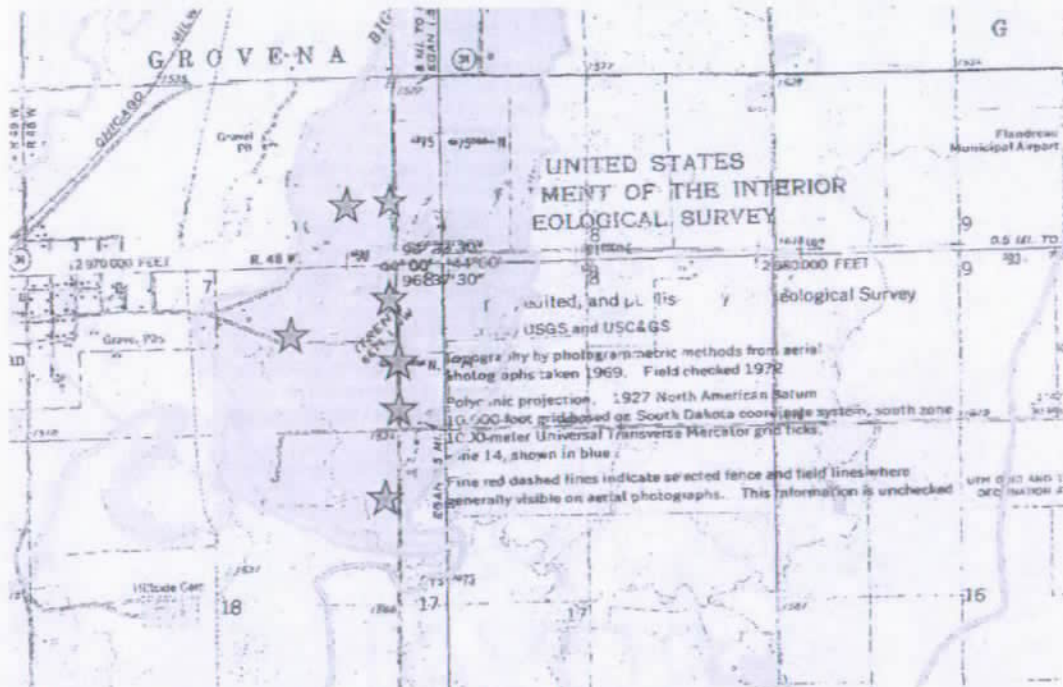
April 1st 2010

Dear Mr. Marceau,

Thank you for your communication concerning our application for the purchase and installation of a geothermal heating and cooling system. Many of the questions included in your questionnaire do not apply to this installation but I will answer and explain my reasoning.

The drinking water facility is located in the SE1/4 of the NE1/4 of section 7, Township 106 North, Range 48 West, in Moody County South Dakota. The treatment facility sits in the valley of the Big Sioux River, approximately 2000 feet away from the river. The present river is a misfit river, sitting in a former glacial valley, approximately 1 mile wide. Saturated sands and gravel, averaging 30 feet in depth, form the unconfined and surficial "Big Sioux Aquifer" from which we take our water. The photo below shows the location of the facility as well as the lime and wash-water lagoons that are located between the facility and the river (line of trees). The water for the proposed geothermal system will be provided by our existing wells, and wastewater will be pumped back to the lagoons (as we do already) to soak back into the underlying aquifer. The small gray panel to the north (right) of the plant is one of our wells and correlates with the top right "star" on the accompanying diagram that illustrates the location of our existing wells.





I will now attempt to answer the questions directly from the questionnaire :

1. The two heat pumps will produce a total of 525,000 BTU.
2. There will be no ground disturbance – existing wells and pipeline will be used.
 - a. No wetlands affected.
 - b. No floodplains affected
 - c. No coastal zone present
 - d. As there will be no physical disturbance out of the existing structure there will be no T&E species affected. Any noise from the pumps will be contained inside existing concrete structure.
3. There will be no bore holes required.
 - a. No new bore holes needed.
 - b. No bore holes needed.
 - c. No new drilling required.
 - d. This will not be a closed loop system – installation of a closed loop system will significantly raise cost of project.
4. Existing water/Propylene glycol system used with present propane boiler system will be used in association with well water.
5. No special design requirements.
6. No county building permit required (exempt). All wells permitted by South Dakota DENR, discharge permitted by South Dakota DENR permit #SDG860001.
7. There will be no excavations or drilling.
8. Materials will be collected by contractor and disposed of at sanitary landfill permitted to accept such materials. No hazardous waste expected to be produced.
9. This is a drinking source aquifer – county ordinances and signage are in place to protect water quality. Big Sioux Community Water's success in wellhead protection is documented in AWWA Research Foundation, 2005, publication 91061 "Water Utility/Agricultural Alliances: Working together for Cleaner water."

If I can offer any further insights into our proposed project, please contact me at (605) 997-2098.
Sincerely,

Martin Jarrett
Manager BSCWS

Report of Examination of Works and/or Application of Water to Beneficial Use For Permit No. 6223-3

I have these days, 30 October 2014 & 26 October 2015, made a thorough examination of the water use system constructed by Big Sioux Community Water System, Inc., 23343 479th Ave. NE, Egan, SD 57024-0158 holder of Permit No. 6223-3, bearing the priority of 17 July 2000 authorizing the diversion of 0.74 cu. ft. per second of the waters of the Big Sioux: Moody aquifer for supplying water to the rural water system.

Inspection contact & relationship to permit holder, if applicable: **Martin Jarrett, Manager**

A. Works used to divert the water:

Well₆ Information:

- 1) Well Drilling Firm: Lacey Well Drilling
- 2) No. of Wells one
- 3) Depth(s) 37 feet
- 4) Well log is available yes

Casing₆:

- 1) Diameter 12 inches
- 2) Length 29 feet
- 3) Type steel

Screen₆:

- 1) Type stainless steel
- 2) Length 8 feet
- 3) Static water level 8 (4 June 2002)

Pump₆:

- 1) Make Grundfos
- 2) Model 300S-100-3AB
- 3) Size 10 HP, 460V
- 4) Capacity 300 GPM

Well₇ Information:

- 1) Well Drilling Firm: Lacey Well Drilling
- 2) No. of Wells one
- 3) Depth(s) 34 feet
- 4) Well log is available yes

Casing₇:

- 1) Diameter 12 inches
- 2) Length 29 feet
- 3) Type steel

Screen₇:

- 1) Type stainless steel
- 2) Length 5 feet
- 3) Static water level 15' 10" (20 May 2004)

Pump₇:

- 1) Make Grundfos
- 2) Model 150S-50-2
- 3) Size 5 HP, 460V
- 4) Capacity 180 GPM

Well₈ Information:

- 1) Well Drilling Firm: Lacey Well Drilling
- 2) No. of Wells one
- 3) Depth(s) 35.5 feet
- 4) Well log is available yes

Casing₈:

- 1) Diameter 12 inches
- 2) Length 26.5 feet
- 3) Type steel

Screens:

- 1) Type stainless steel
- 2) Length 9 feet
- 3) Static water level 14.5 (4 September 2012)

Pumps:

- 1) Make Grundfos
- 2) Model 300S-100-3AB
- 3) Size 10 HP, 460V
- 4) Capacity 300 GPM

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

- 1) Type PVC
- 2) Size 6 inches
- 3) Length 465 feet

Comments: **Buried from well No. 6 to well No. 5**

- 1) Type PVC
- 2) Size 8 inches
- 3) Length 175 feet

Comments: **Buried from well No. 5 to plant**

- 1) Type PVC
- 2) Size 6 inches
- 3) Length 3400 feet

Comments: **Buried from well No. 8 to well No. 7 to plant**

D. Compliance with Permit Requirements:

- 1) Permit qualifications being abided by Yes

If no, describe: na

- 2) Irrigation Questionnaires checked to determine if permit owner started irrigation by the end of construction period na
- 3) Exceptions to compliance are: na

E. Condition and Location:

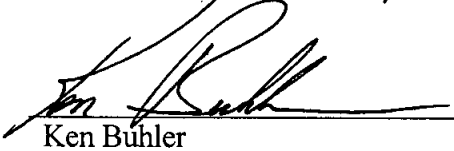
1. The system is in good condition with the points of diversion located as follows: Well #6: 1930 feet south and 650 feet west of the NE corner of Sec. 7, T106N-R48W, (Lat/Lon: 44.00241/-96.63029); Well #7 1392 feet north and 1707 feet west of the SE corner of Sec. 7, T106N-R48W, (Lat/Lon: 43.99694/-96.6344); and Well #8: 41 feet north and 1579 feet west of the SE corner of Sec. 7, T106N-R48W (Lat/Lon: 43.99324, -96.63385)

2. The works are capable of diverting and conveying to the place of use 0.67 cu. ft. per second of water which is to be used for supplying water to the rural water system. Water has been put to beneficial use to the maximum extent and the license should be issued for 0.67 cfs.

3. All structures, wells and lands on map Yes

If no, describe: na

Big Sioux Community Water System, Inc. has 8 wells covered under Water Right Nos 2054-3, 5962-3, 5963-3, 5720B-3 and Water Permit No. 6223-3 as shown on Map 1. Well number 6 was authorized by Water Permit No. 6223-3. On 11 June 2002, the Chief Engineer authorized an additional diversion point (Well number 7) with no increase to the diversion rate authorized by the water permit. Well number 8 was constructed 4 September 2012 as a replacement for well number 7. Well number 7 is no longer used by the water system but retained as a backup. The maximum instantaneous diversion rate from the three wells is 300 gallons per minute (0.67 cfs).



Ken Buhler

DENR, Water Rights Program

Date report completed: 19 March 2016

File No. 6223-3

Approval of Change and Addition of Diversion Points

NAME: Big Sioux Community Water System, Inc.

ADDRESS: Box 158, Egan, SD 57024

DATE: 19 March 2016 **COUNTY:** Moody **TELEPHONE:** (605) 605.997.2098

BACKGROUND:

Water License No. 6223-3 authorized a diversion rate of 0.74 cubic feet per second (cfs) from one well completed into the Big Sioux: Moody aquifer in the SE ¼ NE ¼ of Sec 7, T106N-R48W for the purpose of supplying water to the rural water system. The permit has a priority date of 17 July 2000. The permit is conditioned with well interference, well construction, and annual reporting requirements. On 11 July 2002, Chief Engineer Garland Erbele authorized an additional diversion point (well number 7) with no additional diversion rate authority and no additional appropriation. On 4 September 2012 an additional well was completed (well number 8) in the SE¼ SW¼ SE¼ Sec. 7, T106N-R48W as a replacement for well number 7 due to water quality issues (iron and manganese). Well number 7 has been retained as a back-up well. The maximum instantaneous diversion rate from well numbers 6, 7, and 8 is 300 gallons per minute (0.67 cfs)

AUTHORITY:

Pursuant to SDCL 46-5-13.1, the location of a diversion point may be changed or additional points may be licensed provided the following conditions are met and the potential for interference with other existing diversion is not increased.

- **Developed water source is the same as permitted source and no additional water is appropriated.**

The water source authorized by Water Permit No. 6223-3 is the Big Sioux: Moody aquifer. The existing wells were completed to depths of 37, 34, and 35.5 feet with static water levels or approximately 8, 15'10", and 14'6", respectively. The new well (number 8) was completed into the same aquifer as the two authorized wells.

No additional appropriation of water is authorized. Water Permit No. 6223-3 appropriates 0.74 cfs and no additional diversion rate authority is being requested. After a conversation on 26 October 2015, Mr. Jarrett understands that diverting any additional water beyond the licensed 0.74 cfs will require additional permitting.

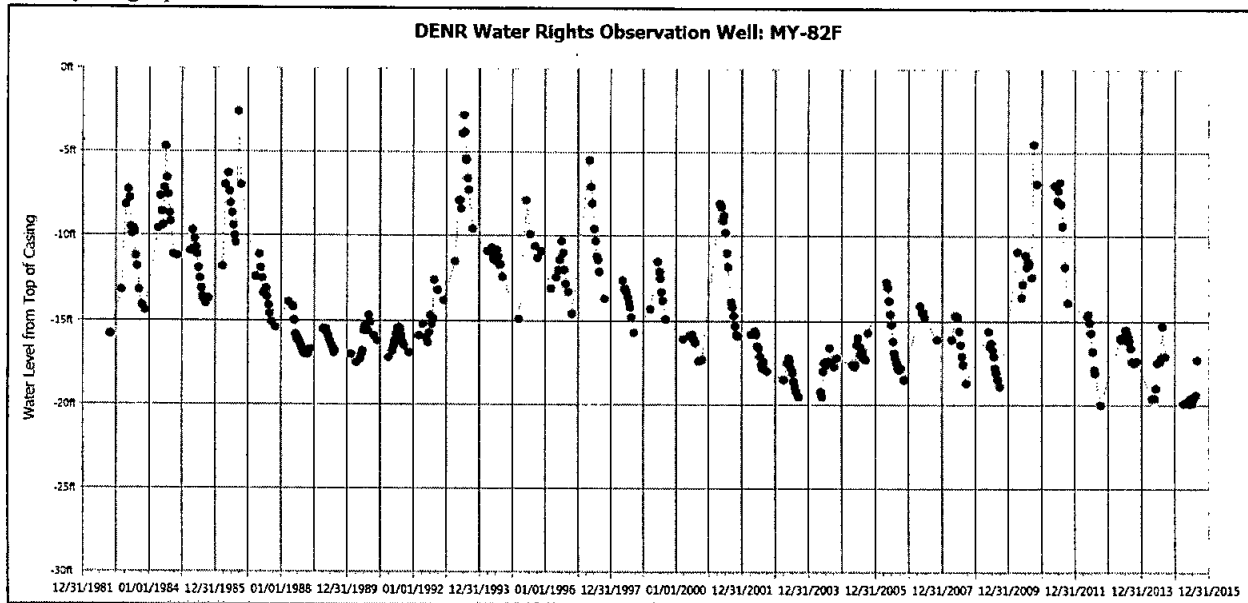
Review of Existing Diversion

The well completion report and water rights databases were reviewed for the nearest domestic wells and water rights on file. The nearest domestic well on file with the DENR-Water Rights Program appears to be located approximately 750 feet to the southwest of Big Sioux Community Water System well No. 8. Considering the unconfined conditions of the Big Sioux: Moody aquifer, and the proximity of the Big Sioux River, well interference is not expected to be a concern. There may be other domestic wells in the

area that are not on file with the Water Rights Program. There have been no interference complaints regarding this existing diversion

Observation Well Data

The Water Rights Program monitors several observation wells completed into the Big Sioux: Moody aquifer. The nearest observation well (MY-82F) is approximately 1290 feet east of the well number 8. The hydrograph for the well is included below.



CONCLUSION

- The additional well do not propose to appropriate additional water.
- The new well is completed into the same aquifer as the existing wells,(i.e. Big Sioux:Moody aquifer).
- Unlawful impairment of existing water rights is not expected to occur.

RECOMMENDED ACTION:

Based on the above criteria, it is recommended that the additional diversion point be approved.

Ken Buhler
SD DENR-Water Rights Program

The Chief Engineer makes a finding pursuant to SDCL 46-5-13.1 and ARSD 74:02:01:14:01 that:
These additional diversion point does not increase the potential for adverse effects to existing diversions.

A handwritten signature in black ink, appearing to read "Jeanne Goodman", written in a cursive style.

Jeanne Goodman, Chief Engineer
Water Rights Program

Big Sioux Community Water System

Map 1

Well No.	PE/LC No.	Latitude	Longitude
1	2054-2	43.99872	-96.6283
2	2054-3	43.99493	-96.6281
3	5962-3	43.99351	-96.6283
4	5963-3	43.99055	-96.6283
5	5720B-3	44.00176	-96.6288
6	6223-3	44.00241	-96.6303
7	6223-3	43.99694	-96.6344
8	6223-3	43.99324	-96.6339

S section line Sec. 7, T106N-R48W

SE corner
Sec. 7, T106N-R48W

Legend

- BSCWS well
- Buried 6-inch PVC



660 330 0 660 Feet

kb
11 Nov. 2015



NE corner of Sec. 7, T106N-R48W

6223-3

Legend

-  Well
-  Buried 8-inch PVC
-  Buried 6-inch PVC
-  Section Boundaries - PLSS



[Handwritten signature]

660 330 0 660 Feet





DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

denr.sd.gov

MAY 02 2016

6223-3

Big Sioux Community Water System Inc
Martin Jarrett
PO Box 158
Egan SD 57024

Dear Mr. Jarrett:

Enclosed is Water License No. 6223-3. This is the final water right document completing your process of obtaining a Water Right. Also, included with your license is a map prepared by the staff engineer who conducted the investigation.

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. 6223-3

(1) Big Sioux Community Water System, Inc., PO Box 158, Egan SD 57024 made Application No. 6223-3, July 17, 2000 for a water permit to divert 0.74 cubic feet of water per second from two wells – Big Sioux:Moody Aquifer, Moody County, South Dakota for rural water system purposes and authorized addition of the City of Flandreau to the system. Permit No. 6223-3, with a priority date of July 17, 2000 was approved November 9, 2000 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before November 9, 2005 and for the application to beneficial use of water on or before November 9, 2009.

An investigation conducted for licensing purposes found an additional diversion point developed under Water Permit No. 6223-3. Pursuant to SDCL 46-5-13.1, the Chief Engineer makes a finding that the additional diversion point does not increase the potential for interference with existing water rights.

(2) The water supply system has been completed and water applied to beneficial use in accordance with South Dakota State Law. Pursuant to South Dakota Codified Law 46-5-30.1, the holder and/or owner of Water Right No. 6223-3 is issued a license, bearing a priority date of July 17, 2000 to appropriate 0.67 cubic feet of water per second from three wells – Big Sioux:Moody Aquifer for rural water system purposes.

The diversion points are located:

Well # 6 – 1,930 feet south and 650 feet west of the NE corner Section 7-T106N-R48W (SE 1/4 NE 1/4)

Well # 7 – 1,392 feet north and 1,707 feet west of the SE corner Section 7-T106N-R48W (NW 1/4 SE 1/4)

Well # 8 – 41 feet north and 1,579 feet west of the SE corner of Section 7-T106N-R48W (SW 1/4 SE 1/4)

Well # 8 was constructed as a replacement well for Well #7. Well # 7 is retained as backup supply well.

(3) This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Permit No. 6223-3 including the following qualifications:

- The wells 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.
- The wells authorized by Permit No. 6223-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28. *The wells were drilled by Lacey Well Drilling in 2002, 2004 and 2012. Copies of the logs are on file with the Water Rights Program.*
- The Big Sioux Community Water Corporation shall report to the Chief Engineer annually the amount of water withdrawn each year from the Big Sioux:Moody Aquifer. *Water use reports are submitted annually and on file with the Water Rights Program.*



Jeanne Goodman, Chief Engineer
Water Rights Program

Department of Environment and Natural Resources

MAY 02 2016

date



