

Considered: \_\_\_\_\_

WATER PERMIT NO. 5208-3

HAP No. same 983-5636

Name of Applicant Kingbrook Rural Water System

Post Office Address Drawer 299, Arlington, SD. 57212

Amount of Water Claimed 1.4 cfs Total Acres none

Source of Water Supply 2 wells, ~50' deep

Water to be used for Rural Water System County Kingsbury, Miner, Lake, Clark, Hamlin, Brookings

About 2 miles NW of DeSmet, SD

PROOF OF PUBLICATION: Received \_\_\_\_\_ Not Received \_\_\_\_\_

APPLICATION: Approved \_\_\_\_\_ Subject to \_\_\_\_\_

F.F. & C.L. Adopted \_\_\_\_\_ Not Approved \_\_\_\_\_ Deferred \_\_\_\_\_

PRIORITY \_\_\_\_\_ Date Received August 15, 1988 Fee \$400<sup>00</sup> Remarks \_\_\_\_\_

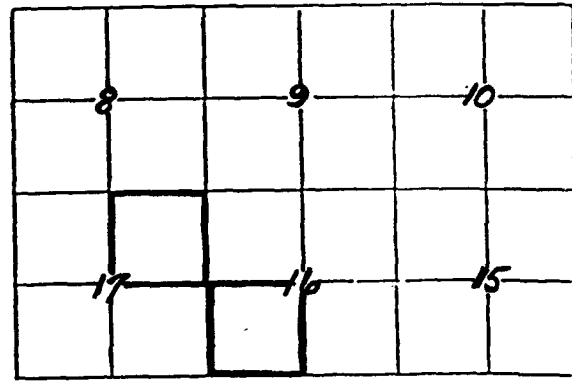
Corrected Application Received \_\_\_\_\_ Period of Annual Use continuously

WATER QUALITY APPROVAL RECEIVED NA APPROVED/CONDITIONAL (Circle one)

WI-1 Description same as Application YES NO REMARKS \_\_\_\_\_

Diversion Point (1) SW 1/4, Sect. 16, T11N, R56W  
(2) NE 1/4, Sect. 17, T11N, R56W

Land to be Irrigated none



Well Log: Driller \_\_\_\_\_ Licensed YES \_\_\_\_\_ NO \_\_\_\_\_

Depth of Well ~50' REMARKS Exact well locations to be determined with add'l drilling and test pumping.

Type of Map sat'd thickness PREPARED BY Gary Patton Reviewed and the Number assigned on Aug. 16, 1988 By Susan A. Brown

Mail to: Water Rights Div.  
DWNR, Foss Bldg.  
Pierre, SD 57501  
(605) 773-3352

|                           |                                 |
|---------------------------|---------------------------------|
| No. <u>5208-3</u>         | Hydrologic Unit <u>10170103</u> |
| Map No. <u>same</u>       | Basin <u>Vermillion R.</u>      |
| Newspaper <u>see file</u> |                                 |

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

Check use of water: Industrial ☐ Commercial ☐ Municipal ☐ Other Common Distribution System ☐  
 Rural Water System ☒ Suburban Housing ☐ Geothermal Heat ☐ Institutional ☐ Recreational ☐  
 Domestic ☐ (above 18gpm) Other ☐

Type of Application: Check one or more of the following

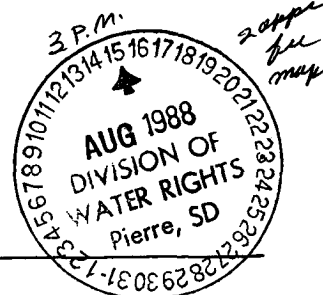
New ☒ Vested Right ☐ Future Use ☐ Change Use ☐

☐ Amend Permit No. \_\_\_\_\_ with old priority date retained

Change diversion point(s) ☐ Add diversion point(s) ☐ Other ☐ \_\_\_\_\_

☐ Application to: Change diversion point(s) ☐ Add diversion point(s) ☐ on Permit No. \_\_\_\_\_

☐ Construction to use water reserved by Future Use Permit No. \_\_\_\_\_



1. Name of Applicant Kingbrook Rural Water System Phone No. (605) 983-5636

Post Office Address Drawer 299, Arlington South Dakota State 57212  
(Street, RR or Box) (City) Zip Code

2. Amount of water claimed (c.f.s.) 1.4

3. Source of water supply Two wells

4. Location of point of diversion SW 1/4 Sec. 16, T 111N, R56W

NE 1/4 Sec. 17, T 111N, R56W

County Kingsbury

Counties where water will be used Minnehaha, McCook, Moody, Brookings  
Kingsbury, Miner, Lake, Clark, Hamlin

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

7. Give a brief description of proposed 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)

NEW MEMBER ADDITIONS - Subproject 2

Addition of equipment in expanded water treatment plant, two wells and a reservoir at the plant, Howard Reservoir, and 131 miles of pipeline and service connections to City of Howard and 109 added members.

Attachments: Attach Form 2A if diversion from a well or dugout, or if storage of water, is proposed. Attach map (see instruction)

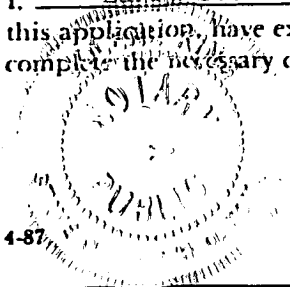
STATE OF SOUTH DAKOTA)  
 County of Kingsbury) ss

I, Larry Sterling 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 Larry Sterling

Subscribed and sworn to before me this 12th day of August 1988

Jolene King  
 Notary Public



**SOUTH DAKOTA  
WATER PERMIT No. 5208-3**

Date of first receipt of application August 15, 1988.

The Water Management Board approved Water Permit Application No. 5208-3 on March 1, 1989 for Kingbrook Rural Water System, Drawer 299, Arlington SD 57212 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. 5208-3 appropriates 1.4 cubic feet of water per second from 2 wells (Vermillion East Fork Aquifer) 50 feet deep to be located in the SW 1/4 section 16; NE 1/4 section 17; all in T111N-R56W. This permit also allows the Cities of Oldham and Howard to connect to the distribution system of the Kingbrook Rural Water System.
2. The water appropriated shall be used for the purpose of supplying the Kingbrook Rural Water System and may not exceed the amount of water needed for beneficial use for rural water system use.
3. The water is to be used during the following described annual period: January 1 - December 31.
4. The date from which applicant may claim right is August 15, 1988.
5. One-fifth of the construction is to be completed on or before September 1, 1991.
6. All construction is to be completed on or before March 1, 1994.
7. Water is to be put to beneficial use on or before March 1, 1998.
8. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

**QUALIFICATIONS**

1. Wells authorized by Permit No. 5208-3 shall be spaced at least 660 feet apart and at least 660 feet from other wells.
2. The casings of the wells to be constructed under Permit No. 5208-3 shall be pressure grouted with cement (bottom to top) from the producing formation to the surface and the well constructed in compliance with Water Management Board Well Construction Rules, Chapter 74:02:04.
3. 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.
4. The Kingbrook Rural Water System shall report to the chief engineer annually the amount of water withdrawn each year from the Vermillion East Fork Aquifer.
5. Approval of Permit No. 5208-3 authorizes maximum combined annual withdrawals under Permits No. 4137-3, 5186-3, and 5208-3 of up to 1,350 acre feet.

**WATER MANAGEMENT BOARD**

By: \_\_\_\_\_

Chief Engineer, Water Rights Division  
Department of Water and Natural Resources

**SEP 12 1989**

(date) \_\_\_\_\_

# Supplemental Information

(type or print in ink)

## 1. Well Information - Proposed construction

- a) Drill Hole Diameter 20" Depth 50'
- b) Casing Type Black steel Diameter 12" Thickness 0.375"
- c) Screen Type Stainless steel Diameter 12" Thickness 3/16"
- d) Gravel Pack Thickness 4" Length of Gravel Pack 30'
- 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 None On property owned by others 660'

## 2. Dugout Information Estimates

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

## 3. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below. The locations of each dam should 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 \_\_\_\_\_

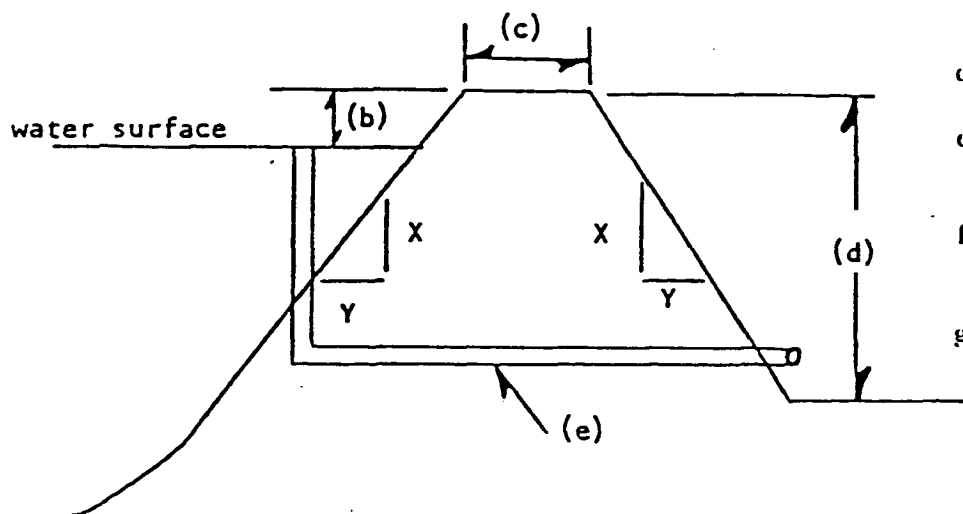
g) X & Y Slope  
 Upstream \_\_\_\_\_

Downstream \_\_\_\_\_

Surface Area of Impoundment \_\_\_\_\_

Storage \_\_\_\_\_ acre feet

Drainage area above dam \_\_\_\_\_



Signature of Applicant \_\_\_\_\_

This report and/or map is preliminary and has not been edited or reviewed for conformity with State Geological Survey standards or nomenclature.

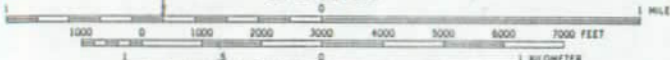
Exact well locations to be verified with additional drilling and test pumping.

I hereby certify that this plan, specification or report was prepared by me or under my direct personal supervision and that I am a duly Registered Professional Engineer under the laws of the State of South Dakota, and that I am competent to prepare the document.  
Registration No. 1617 Date 8/10/88  
By Sam Pitts

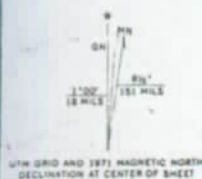
**SATURATED THICKNESS MAP OF THE VERMILION EAST FORK AQUIFER IN THE SPIRIT LAKE - DE SMET AREA.**

- well
- test hole
- ▲ irrigation well
- ☆ Kingbrook RWS production well
- 43/60\* saturated thickness of sand and gravel  
depth to base of sand and gravel
- 68 ← total depth of test hole or well
- \* Indicates composite saturated thickness
- NDE not deep enough, hole may not have completely penetrated sand and gravel unit
- - - contour of saturated thickness in feet, dashed where approximate, ? in areas of limited data
- CO-88-24 test hole and water analysis codes, respectively
- KBR-88-24

SCALE 1:24,000



CONTOUR INTERVAL 10 FEET  
DATUM IS MEAN SEA LEVEL



UTM GRID AND 1971 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

Appl. No. 5208-3

# RECEIPT

Division of Water Rights

South Dakota Department of Water and Natural Resources

411355

Pierre, August 16, 19 88

RECEIVED OF Kingbrook Rural Water System, Inc., Drawer 299, Arlington, SD 57212

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

|                                                                                                                                    |       |        |
|------------------------------------------------------------------------------------------------------------------------------------|-------|--------|
| Fee for Application for Permit No. <u>5208-3</u> to Appropriate Water, to construct works and to put water to beneficial use _____ | 400   | 00     |
| Fee for Application for Permit No. _____ to Appropriate Water for Future Use _____                                                 |       |        |
| Fee to retain Future Use Permit No. _____ after period of seven years.                                                             |       |        |
| Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. _____                                |       |        |
| Fee for Filing Transfer Form _____                                                                                                 |       |        |
| Fee for Filing Extension Request _____                                                                                             |       |        |
| Fee for Certified Copy of _____                                                                                                    |       |        |
| Fee for Print Copy of Map _____                                                                                                    |       |        |
| Fee for Certifying _____                                                                                                           |       |        |
| Fee for _____                                                                                                                      |       |        |
| (Any Other Work Provided by Law)                                                                                                   | Total | 400 00 |

By

John Hatch  
Chief Engineer JOHN HATCH *ems*

**DeWild Grant Reckert & Associates Co.**  
Architecture Engineering and Planning

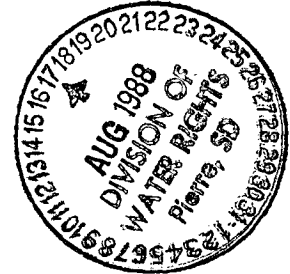
315 First Avenue  
Rock Rapids, Iowa 51246  
(712) 472-2531

August 15, 1988

Water Rights Division, DWNR  
Joe Foss Building  
Pierre, SD 57501-3181

Attn: Ron Duvall

Re: Kingbrook Rural Water System  
DGR File No. 3729



Dear Ron:

Enclosed are logs of thirty (30) test holes drilled by the S.D.G.S. in June and July this year in the Vermillion East Fork Aquifer in the Spirit Lake-DeSmet area. This information is provided to supplement the applications submitted by Kingbrook for water withdrawal and future use permits in this area. Please call me if you require any further information regarding the Kingbrook applications.

Very truly yours,

DEWILD GRANT RECKERT  
& ASSOCIATES COMPANY

A handwritten signature in cursive script, appearing to read 'Gary Patton'.

Gary Patton, P.E.

GJP:ldb

Enclosures

cc: Kingbrook RWS w/encl.

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook RW Study Location 111 N 56 W 5 B B A B  
County Kingbury Well no. C 88-49 Test hole no. \_\_\_\_\_  
Driller(s) J. Probst Geologist/Hydrologist Kurt Wilkie  
Start Date July 14 Finish Date July 14 Elevation 1742 Total hole depth 37  
Method: R A HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 10 ft. to 0 ft. Tremie pipe/drill stem depth 5  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.8 lbs.  
WELL BACKFLUSHED y n Number of gallons 600

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from 10 ft. to 0 ft. Tremie pipe depth 5 ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.8 lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts 2  
Total casing and screen 30.5 ft. Total casing length 15.5 ft. Stick-up 2 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 15 ft. from 2.8 ft. to 13.5 ft. Diameter 2 in.  
Slot size 0.016 in. Bottom notched: y n Schedule 80 glued threaded  
Type PVC Bottom open: y n Notes C blank  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 8 ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from 37 ft. to 10 ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_



SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG  
Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingsbrook RW Study Location 11 N 56 W 5 B B C C  
County Kingsbury Well no. 0088-48 Test hole no. \_\_\_\_\_  
Driller(s) D. J. Jorgensen Geologist/Hydrologist Kurt Wilke  
Start Date July 13 Finish Date July 13 Elevation 11238 Total hole depth 77  
Method: R/A HSA E-log: y n Disinfectant: n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 3 1/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

**HOLE ABANDONMENT / WELL COMPLETION**

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 14 ft. to 0 ft. Tremie pipe/drill stem depth 14  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 9.5 lbs.  
WELL BACKFLUSHED: y n Number of gallons 800

**SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION**

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

**WELL MATERIALS**

Number of fence posts 2  
Total casing and screen 51 ft. Total casing length 16 ft. Stick-up 2 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 15 ft. from 31 ft. to 46 ft. Diameter 2 in.  
Slot size 0.06 in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y (n) Notes \_\_\_\_\_  
HM. MD. SCR: Length 20 ft. from 41 ft. to 61 ft. Diameter 2 in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule 16 glued threaded  
Type \_\_\_\_\_ Cutting method Back saw Bottom open: y (n)  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 26 ft. Bottom open: y (n) Top notched: y n  
Bottom notched: y n Top open to screen: y (n)

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from 77 ft. to 14 ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe 14 ft. Notes \_\_\_\_\_

and has not been edited or reviewed for  
Location conformity with State Geological Survey

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project King Brook RW Study Location 11N 56W 5 Q CCC  
County Singularity Well no. Co 88-44 Test hole no. \_\_\_\_\_  
Driller(s) D. J. Baker Geologist/Hydrologist \_\_\_\_\_  
Start Date July 10 Finish Date July 12 Elevation 1734 Total hole depth 57  
Method: (R) A HSA E-log (y) n Disinfectant: y (n) Lubricant: y (n) Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 23 ft. to 0 ft. Tremie pipe/drill stem depth 23  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: (y) n Number of gallons 800

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS Number of fence posts 3  
Total casing and screen 43 ft. Total casing length 33 ft. Stick-up 2 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 41 ft. to 31 ft. Diameter 2 in.  
Slot size 10/16 in. Bottom notched: y (n) Schedule 80 glued threaded  
Type PVC Bottom open: y (n) Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 15 ft. Bottom open: y (n) Top notched: (y) n  
Bottom notched: (y) n Top open to screen: y (n)

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from 57 ft. to 23 ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

**Location**

This report and/or map is preliminary and has not been edited or reviewed for conformity with State Geological Survey standards or nomenclature.

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook B.W. study Location 41N 56W S 2000  
County Kingbury Well no. C-88-38 Test hole no. \_\_\_\_\_  
Driller(s) D. Jackson Geologist/Hydrologist Kurt W. Shue  
Start Date July 7 Finish Date July 7 Elevation 1236 Total hole depth 57  
Method: R A HSA E-log: y ☒ Disinfectant: y ☒ Lubricant: y ☒ Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y ☒ n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 34 ft. to 0 ft. Tremie pipe/drill stem depth 25  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: ☒ n Number of gallons 800

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y ☒ n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts 3  
Total casing and screen 46 ft. Total casing length 36 ft. Stick-up 2 ft.  
Diameter 2 in. Type PLC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 42 ft. to 32 ft. Diameter 2 in.  
Slot size 0.16 in. Bottom notched: y ☒ n Schedule 80 glued threaded  
Type PLC Bottom open: y ☒ n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y ☒ n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y ☒ n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 15 ft. Bottom open: y ☒ n Top notched: ☒ n  
Bottom notched: ☒ n Top open to screen: y ☒ n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from 57 ft. to 34 ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

### Location

~~This report and/or map is preliminary and has not been edited or reviewed for conformity with State Geological Survey standards or nomenclature.~~

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project King Brook RW study Location 11N 56W 5 S 00a  
County King Well no. \_\_\_\_\_ Test hole no. C88-36  
Driller(s) D Jacobson Geologist/Hydrologist Kurt W. Elkin  
Start Date July 6 Finish Date July 6 Elevation 1726 Total hole depth 42  
Method: RA HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.

Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_

Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_

BENTONITE GROUT: from 0 ft. to 47 ft. Tremie pipe/drill stem depth 47Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 9.9 lbs.WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_

Initial Bentonite top \_\_\_\_\_ ft. below surface

BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.

Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.

Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_

CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_

Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_

LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS Number of fence posts \_\_\_\_\_

Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.

Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded

MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.

Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threadedType \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_

HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.

Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threadedType \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n

Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y nBottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

and has not been edited or reviewed for  
conformity with State Geological Survey

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project King Brook RW study Location 14N 56W 6 DADA  
County Kingsbury Well no. 098-39 Test hole no. \_\_\_\_\_  
Driller(s) D. J. Johnson Geologist/Hydrologist Kurt W. White  
Start Date July 7 Finish Date July 7 Elevation 1735 Total hole depth 77  
Method: RA HSA E-log: y Disinfectant: y Lubricant: y Type \_\_\_\_\_  
Bit Dia. 6 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 26 3/4 ft. to 0 ft. Tremie pipe/drill stem depth 26  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type 1 No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts \_\_\_\_\_  
Total casing and screen 63 ft. Total casing length 53 ft. Stick-up 2 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 60 ft. to 51 ft. Diameter 2 in.  
Slot size 0.16 in. Bottom notched: y n Schedule 80 glued threaded  
Type PVC Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 15 ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from 72 ft. to 34 ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

NAT gravel PACK (cave in)

**Location**

~~This report and/or map is preliminary and has not been edited or reviewed for conformity with State Geological Survey standards or nomenclature.~~

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project King Creek RW study Location 111N 56W 10 B3D D  
County King Well no. \_\_\_\_\_ Test hole no. CS 88-34  
Driller(s) A. Jacobs Geologist/Hydrologist Kurt Wilke  
Start Date July 6 Finish Date July 6 Elevation 1714 Total hole depth 47  
Method: RA HSA E-log: y Disinfectant: y Lubricant: y Type \_\_\_\_\_  
Bit Dia. 3 1/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 47 ft. Tremie pipe/drill stem depth 47  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.8 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded \_\_\_\_\_  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded \_\_\_\_\_  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded \_\_\_\_\_  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

### Location

~~This report and/or map is preliminary and has not been edited or reviewed for conformity with State Geological Survey standards or nomenclature.~~

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook Rv Study Location 14N 56W 10 E S 22  
County Tioga Well no. \_\_\_\_\_ Test hole no. 088-30  
Driller(s) J. Brock Geologist/Hydrologist Kurt W. He  
Start Date June 30 Finish Date June 30 Elevation 1730 Total hole depth 57  
Method: ☒ A HSA E-log: ☒ Disinfectant: ☒ Lubricant: ☒ Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: ☒ n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 57 ft. Tremie pipe/drill stem depth 57  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: ☒ n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from 0 ft. to 57 ft. Tremie pipe depth 57 ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED ☒ n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: ☒ n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: ☒ n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: ☒ n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: ☒ n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: ☒ n Top notched: ☒ n  
Bottom notched: ☒ n Top open to screen: ☒ n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

| Location |
|----------|
|----------|

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingsbury RW Study Location 11N 56W 10 B0B0  
County Kingsbury Well no. \_\_\_\_\_ Test hole no. C08831  
Driller(s) D. Jacobs Geologist/Hydrologist Kurt Wilke  
Start Date July 5 Finish Date July 5 Elevation 1728 Total hole depth 47  
Method: PA-HSA E-log: y n Disinfectant: y n Lubricant: n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 47 ft. Tremie pipe/drill stem depth 47  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded \_\_\_\_\_  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded \_\_\_\_\_  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded \_\_\_\_\_  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

and has not been edited or reviewed for  
Location conformity with State Geological Survey

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingsport River Study Location 11 N 56 W 10 C C B B  
County Kingsbury Co Well no. \_\_\_\_\_ Test hole no. 88-32  
Driller(s) D. Jacobson Geologist/Hydrologist Kurt W. W. W.  
Start Date July 5 Finish Date July 5 Elevation 1726 Total hole depth 47  
Method: R A HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 47 ft. Tremie pipe/drill stem depth 47  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 5.7 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

**Location**

This report and/or map is preliminary and has not been edited or reviewed for conformity with State Geological Survey standards or nomenclature.

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook PW Study Location 111N 56W 16 BAAA  
County Kingbury Well no. \_\_\_\_\_ Test hole no. C098 29  
Driller(s) J. Johnson Geologist/Hydrologist Kurt Walke  
Start Date June 30 Finish Date June 30 Elevation 1714 Total hole depth 57  
Method: (R) A HSA E-log: y (n) Disinfectant: y (n) Lubricant: y (n) Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 57 ft. Tremie pipe/drill stem depth 57  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
WELL BACKFLUSHED: y n Number of gallons 8.7

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

| Location |
|----------|
|----------|

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook RW Study Location 111 N 56 W 16 C C O B  
County Kingberry Well no. Co 88-20 Test hole no. \_\_\_\_\_  
Driller(s) R. J. Johnson Geologist/Hydrologist Kurt Wilkie  
Start Date June 22 Finish Date June 22 Elevation 1720 Total hole depth 77  
Method: (R) A HSA E-log (y) n Disinfectant: y (n) Lubricant: y (n) Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 15 ft. Tremie pipe/drill stem depth 15  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.7 lbs.  
WELL BACKFLUSHED: y n Number of gallons 900

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts 3  
Total casing and screen 76 ft. Total casing length 51 ft. Stick-up 2 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 49 ft. to 59 ft. Diameter 2 in.  
Slot size .016 in. Bottom notched: y (n) Schedule 80 glued threaded  
Type PVC Bottom open: y (n) Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 15 ft. Bottom open: y (n) Top notched: (y) n  
Bottom notched: (y) n Top open to screen: y (n)

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from 76 ft. to 15 ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

| Location |
|----------|
|----------|

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Hingham R. Study Location 111 N 56 W 16 E 20 D  
County Hingham Well no. \_\_\_\_\_ Test hole no. C088-21  
Driller(s) R. Gibson Geologist/Hydrologist Art Wilkie  
Start Date June 22 Finish Date June 22 Elevation 1712 Total hole depth 37  
Method: (R) A HSA E-log: (y) n Disinfectant: y (n) Lubricant: y (n) Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 56 ft. Tremie pipe/drill stem depth 56  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.8 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

Location \_\_\_\_\_

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingsbrook RW Study Location 11N 56W-16 C.D.C.C.  
County Kingsberry Well no. C088-22 Test hole no. \_\_\_\_\_  
Driller(s) D. Jackson Geologist/Hydrologist Kurt Wilke  
Start Date June 23 Finish Date June 23 Elevation 1712 Total hole depth 57  
Method: (R) A HSA E-log: (y) n Disinfectant: y (n) Lubricant: y (n) Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 34 ft. to 0 ft. Tremie pipe/drill stem depth 34  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts 3  
Total casing and screen 56 ft. Total casing length 10 ft. Stick-up 216 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 36 ft. to 46 ft. Diameter 2 in.  
Slot size 0.16 in. Bottom notched: y (n) Schedule 80 glued threaded  
Type PVC Bottom open: y (n) Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from 56 ft. to 34 ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

| Location |
|----------|
|----------|

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook R.W. Study Location 111N 56W-16  
 County King Well no. C288-23 Test hole no. 2000  
 Driller(s) D. J. Jakes Geologist/Hydrologist Kurt Wilke  
 Start Date June 27 Finish Date June 27 Elevation 1716 Total hole depth 69  
 Method: EA HSA E-log: y Disinfectant: y Lubricant: y Type A  
 Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
 Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
 Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
 BENTONITE GROUT: from 44 ft. to 0 ft. Tremie pipe/drill stem depth \_\_\_\_\_  
 Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
 WELL BACKFLUSHED: y n Number of gallons 1000

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
 Initial Bentonite top \_\_\_\_\_ ft. below surface  
 BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
 Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
 Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
 Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
 CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
 Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
 LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts 3  
 Total casing and screen 66 ft. Total casing length 36 ft. Stick-up 2 ft.  
 Diameter 2 in. Type PVC Schedule 80 glued threaded  
 MFG. SCR: Length 10 ft. from 50 ft. to 60 ft. Diameter 2 in.  
 Slot size 0.16 in. Bottom notched: y (n) Schedule 80 glued threaded  
 Type PVC Bottom open: y (n) Notes \_\_\_\_\_  
 HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
 Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
 Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
 Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 5 ft. Bottom open: y (n) Top notched: (y) n  
 Bottom notched: (y) n Top open to screen: y (n)

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from 65 ft. to 44 ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

Location

| Footage | Lithologic Description                                                                                                                                | Driller's Notes |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 0-5     | Black top soil                                                                                                                                        |                 |
| 5-30    | Coarse gravel Boulders                                                                                                                                |                 |
| 30-32   | gray sand till clay                                                                                                                                   |                 |
| 32-47   | gravel med                                                                                                                                            |                 |
| 47-50   | gray sandy till clay                                                                                                                                  |                 |
| 50-57   | gravel med                                                                                                                                            |                 |
| 57-67   | gray sandy till                                                                                                                                       |                 |
|         |                                                                                                                                                       |                 |
|         |                                                                                                                                                       |                 |
|         |                                                                                                                                                       |                 |
|         |                                                                                                                                                       |                 |
|         |                                                                                                                                                       |                 |
|         |                                                                                                                                                       |                 |
|         |                                                                                                                                                       |                 |
|         |                                                                                                                                                       |                 |
| 0-5     | Topsoil. Black organic; oxidized                                                                                                                      |                 |
| 5-28    | Gravel <sup>and sand</sup> , reddish-yellow coarse gravel. rubble to boulders(?) size, sandy, poorly sorted, oxidized, calcareous matrix, Mn staining |                 |
| 28-31   | Silt, gray, slightly sandy and pebbly; coal fragments; unoxidized calcareous                                                                          |                 |
| 31-47   | Gravel, grayish, coarse to fine, sandy, poorly sorted, unoxidized, calcareous matrix                                                                  |                 |
| 46-48   | Silt, gray, clayey, slightly sandy; unoxidized calcareous. Resistivity indicates possible pebbles but not confirmed by logs. ←                        |                 |
| 48-59   | Gravel, grayish, coarse to fine, sandy, unoxidized, calcareous matrix                                                                                 |                 |
| 59-67   | Clay, gray, very silty, sandy, pebbly, unoxidized, calcareous. (Till)                                                                                 |                 |
|         |                                                                                                                                                       |                 |
|         |                                                                                                                                                       |                 |
|         |                                                                                                                                                       |                 |
|         |                                                                                                                                                       |                 |
|         |                                                                                                                                                       |                 |

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project King Brook RW Study Location 11N 56W 16 CAD  
County King Well no. C088-24 Test hole no. \_\_\_\_\_  
Driller(s) D. Jacobson Geologist/Hydrologist Kurt Wilke  
Start Date June 26 Finish Date June 28 Elevation 1711 Total hole depth 37  
Method: BA HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 10 ft. Tremie pipe/drill stem depth 10  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: y n Number of gallons 800

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_

LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS Number of fence posts 3  
Total casing and screen 38 ft. Total casing length 16 ft. Stick-up 2 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 24 ft. to 14 ft. Diameter 2 in.  
Slot size 0.16 in. Bottom notched: y n Schedule 80 glued threaded  
Type PVC Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 12 ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from 10 ft. to 36 ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

Location \_\_\_\_\_

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingsbrook RW Study Location 111N 56W 16 BDDO  
County Kingsbury Well no. \_\_\_\_\_ Test hole no. CO 88-25  
Driller(s) D. Johnson Geologist/Hydrologist Kurt W. Ike  
Start Date June 28 Finish Date June 28 Elevation 1709 Total hole depth 37  
Method RA HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 37 ft. Tremie pipe/drill stem depth 37  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.7 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

Location \_\_\_\_\_

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook RW Study Location 111N 56W 16 C BDD  
County Kingberry Well no. Co 88-26 Test hole no. \_\_\_\_\_  
Driller(s) D. Galbraith Geologist/Hydrologist Kurt Wilke  
Start Date June 28 Finish Date June 28 Elevation 1711 Total hole depth 57  
Method: B A HSA E-log: y n Disinfectant: Q n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 25 ft. to 0 ft. Tremie pipe/drill stem depth 25  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: y n Number of gallons 1000

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts 3  
Total casing and screen 58 ft. Total casing length 30 ft. Stick-up 2 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 28 ft. to 38 ft. Diameter 2 in.  
Slot size 0.16 in. Bottom notched: y Q Schedule 80 glued threaded  
Type PVC Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 18 ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from 57 ft. to 25 ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

| Location |
|----------|
|----------|

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook RW Study Location 11N56W 17 AA  
County Kingbury Well no. \_\_\_\_\_ Test hole no. C088-42  
Driller(s) D Jacobson Geologist/Hydrologist Burt Wilber  
Start Date July 12 Finish Date July 12 Elevation 1711 Total hole depth 57  
Method: (R) A HSA E-log: (y) n Disinfectant: y (n) Lubricant: y (n) Type \_\_\_\_\_  
Bit Dia. 1 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0-57 ft. to 57 ft. Tremie pipe/drill stem depth 57  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.7 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

and has not been edited or reviewed for  
Location conformity with State Geological Survey  
standards.

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook RW Study Location 14 N 56 W 17 BBBB  
County King Well no. \_\_\_\_\_ Test hole no. 088 43  
Driller(s) D. Jackson Geologist/Hydrologist Kurt Wilke  
Start Date July 12 Finish Date July 12 Elevation 1748 Total hole depth 97  
Method: R A HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 97 ft. Tremie pipe/drill stem depth 97  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.8 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

### Location

This report and/or map is preliminary and has not been edited or reviewed for conformity with State Geological Survey standards or nomenclature.

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project King Brook RW Study Location 44N56W 12 ADC  
County King Well no. C088-45 Test hole no. \_\_\_\_\_  
Driller(s) D. Jackson Geologist/Hydrologist Kurt Walker  
Start Date July 13 Finish Date July 13 Elevation 1732 Total hole depth 77  
Method: ☒ A HSA E-log: ☒ Disinfectant: ☒ Lubricant: ☒ Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: ☒ Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 45 ft. to 0 ft. Tremie pipe/drill stem depth 35  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: ☒ n Number of gallons 200

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED ☒ n Notes \_\_\_\_\_

WELL MATERIALS Number of fence posts 3  
Total casing and screen 66 ft. Total casing length 56 ft. Stick-up 2 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 64 ft. to 54 ft. Diameter 2 in.  
Slot size 9/16 in. Bottom notched: ☒ n Schedule 80 glued threaded  
Type PVC Bottom open: ☒ n Notes \_\_\_\_\_  
HM.MD.SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: ☒ n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: ☒ n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 12 ft. Bottom open: ☒ n Top notched: ☒ n  
Bottom notched: ☒ n Top open to screen: ☒ n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from 77 ft. to 45 ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

and has not been edited or reviewed for  
Location conformity with State Geological Survey

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook RW study Location 11N56W 17 AC BB  
County King Well no. \_\_\_\_\_ Test hole no. C-85-46  
Driller(s) D. Jacobson Geologist/Hydrologist Kurt W. Loe  
Start Date July 13 Finish Date July 13 Elevation 1736 Total hole depth 67  
Method: R A HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 67 ft. Tremie pipe/drill stem depth 67  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

And has not been edited or reviewed for  
Location conformity with State Geological Survey  
standards.

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project King brook RW study Location 117N56W17B000  
County Kingbury Well no. \_\_\_\_\_ Test hole no. C088-47  
Driller(s) R. Jacobson Geologist/Hydrologist \_\_\_\_\_  
Start Date July 15 Finish Date July 13 Elevation 1718 Total hole depth 67  
Method: RA HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.

Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_

Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_

BENTONITE GROUT: from 0 ft. to 67 ft. Tremie pipe/drill stem depth \_\_\_\_\_Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.8 lbs.WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_

Initial Bentonite top \_\_\_\_\_ ft. below surface

BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.

Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.

Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_

CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_

Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_

LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS \_\_\_\_\_ Number of fence posts \_\_\_\_\_

Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.

Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded

MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.

Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threadedType \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_

HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.

Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threadedType \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n

Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y nBottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

and has not been edited or reviewed for  
conformity with State Geological Survey

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project King Brook RW study Location 41N 56W 17 ACC  
County King Well no. 0088-35 Test hole no. \_\_\_\_\_  
Driller(s) D. Jackson Geologist/Hydrologist Kurt W. Shie  
Start Date July 6 Finish Date July 6 Elevation 1722 Total hole depth 77  
Method: FA HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 45 ft. to 0 ft. Tremie pipe/drill stem depth 86  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.7 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts 3  
Total casing and screen 56 ft. Total casing length 46 ft. Stick-up 25 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 56 ft. to 46 ft. Diameter 2 in.  
Slot size 0.016 in. Bottom notched: y n Schedule 80 glued threaded  
Type PVC Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 20 ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from 76 ft. to 45 ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

and has not been edited or reviewed for  
Location conformity with State Geological Survey

[illegible]

SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG  
Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook RW Study Location 111N 56W 18 0000  
County King Well no. 88-41 Test hole no. \_\_\_\_\_  
Driller(s) JD Johnson Geologist/Hydrologist Kurt Wilkie  
Start Date July 11 Finish Date July 11 Elevation 1270 Total hole depth 27  
Method: RA HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

**HOLE ABANDONMENT / WELL COMPLETION**

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 45 ft. to 0 ft. Tremie pipe/drill stem depth 35  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: y n Number of gallons 800

**SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION**

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

**WELL MATERIALS**

Number of fence posts 2  
Total casing and screen 62 ft. Total casing length 52 ft. Stick-up 2.5 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 59 ft. to 49 ft. Diameter 2 in.  
Slot size 0.16 in. Bottom notched: y n Schedule 80 glued threaded  
Type PVC Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 12 ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from 73 ft. to 45 ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

**Location**

~~This report and/or map is preliminary and has not been edited or reviewed for conformity with State Geological Survey standards or nomenclature.~~

SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG  
Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbury RW Study Location 11N 56 W 18 AA BA  
County Kingbury Well no. \_\_\_\_\_ Test hole no. CO 88-37  
Driller(s) D. Jackson Geologist/Hydrologist Kurt Wilke  
Start Date July 7 Finish Date July 7 Elevation 1755 Total hole depth 127  
Method: RA HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 127 ft. Tremie pipe/drill stem depth 127  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.9-8.7 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS

Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

and has not been edited or reviewed for  
Location conformity with State Geological Survey

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project King B. Road RW study Location 11N 56W 20A AOB  
County King Well no. C08840 Test hole no. \_\_\_\_\_  
Driller(s) D. J. [unclear] Geologist/Hydrologist Furtw. [unclear]  
Start Date July 78 Finish Date July 78 Elevation 1728 Total hole depth 97  
Method: RA HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 65 ft. to 0 ft. Tremie pipe/drill stem depth 55  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 81 lbs.  
WELL BACKFLUSHED: y n Number of gallons 800

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS Number of fence posts 2  
Total casing and screen 83 ft. Total casing length 73 ft. Stick-up 2 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 81 ft. to 71 ft. Diameter 2 in.  
Slot size 10/16 in. Bottom notched: y n Schedule 80 glued threaded  
Type PVC Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 9 ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n  
CENTRALIZERS: How many 38 Depth(s) \_\_\_\_\_  
FILTER PACK: from 97 ft. to 38 ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

Location

~~This report and/or map is preliminary and has not been edited or reviewed for conformity with State Geological Survey standards or nomenclature.~~

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project King Brook R.W. Study Location 111N 56W 20 ABBB  
County Hing. Barry Well no. \_\_\_\_\_ Test hole no. C089.28  
Driller(s) D. Jacobine Geologist/Hydrologist Rust Wille  
Start Date June 30 Finish Date June 3 Elevation 1218 Total hole depth 67  
Method: R A HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 65 ft. Tremie pipe/drill stem depth \_\_\_\_\_  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.7 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_

CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

Location \_\_\_\_\_

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingsbrook RW Study Location 11N 56W 21 BCC  
County Kingsbury Well no. C089-27 Test hole no. \_\_\_\_\_  
Driller(s) D. J. J. J. Geologist/Hydrologist Kurt Walke  
Start Date June 29 Finish Date June 29 Elevation 1 Total hole depth 87  
Method: RA HSA E-log: n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 55 ft. to 0 ft. Tremie pipe/drill stem depth 55  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 6.6 lbs.  
WELL BACKFLUSHED: n Number of gallons 800

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS Number of fence posts 2  
Total casing and screen 85 ft. Total casing length 69 ft. Stick-up 2.5 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 78 ft. to 68 ft. Diameter 2 in.  
Slot size 0.16 in. Bottom notched: y n Schedule 80 glued threaded  
Type PVC Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 6 ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from 44 ft. to 55 ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

| Location |
|----------|
|----------|

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook R/W Study Location 11N 56W 21 AAB B  
County King Durg Well no. \_\_\_\_\_ Test hole no. Co 88-33  
Driller(s) D. Jacobsen Geologist/Hydrologist Kurt Wilke  
Start Date July 5 Finish Date July 5 Elevation 1706 Total hole depth 47  
Method: R A HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.

Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_

Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_

BENTONITE GROUT: from 0 ft. to 47 ft. Tremie pipe/drill stem depth 47

Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.

WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_

Initial Bentonite top \_\_\_\_\_ ft. below surface

BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.

Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.

Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_

CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_

Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_

LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts \_\_\_\_\_

Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.

Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded

MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.

Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threadedType \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_

HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.

Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threadedType \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n

Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y nBottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

and has not been edited or reviewed for  
conformity with State Geological Survey

[illegible]

## Conversation or File Documentation

NAME OF PERSON OR FILE: Morris Elcock, Manager

ADDRESS: \_\_\_\_\_ COUNTY \_\_\_\_\_

DATE: August 29, 1988 TELEPHONE 983-5636RE: Connection of Oldham to the rural water system

COMMENTS:

Morris Elcock, Manager of the Kingbrook Rural Water System, was contacted via phone to determine if Oldham is to be added to the distribution system. Mr. Elcock indicated that Oldham had a service connection but was not being supplied water to this point. I told Mr. Elcock that Oldham should be included on the application with Howard if neither has been receiving water. Mr. Elcock stated that Oldham can be added to the permit application.

File in Permit or other file as necessary. Use to document conversations and what the other party was told; why action or decision was made.

NAME: Don Duval

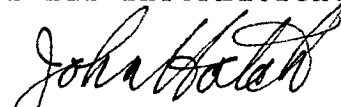
RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT  
APPLICATION NO. 5208-3, Kingbrook Rural Water System

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Division, Department of Water and Natural Resources concerning Water Permit Application No. 5208-3, Kingbrook Rural Water System, Drawer 299, Arlington SD.

The Chief Engineer is recommending APPROVAL of Application No. 5208-3 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) in the public interest with the following qualifications:

1. Wells authorized by Permit No. 5208-3 shall be spaced at least 660 feet apart and at least 660 feet from other wells.
2. The casings of the wells to be constructed under Permit No. 5208-3 shall be pressure grouted with cement (bottom to top) from the producing formation to the surface and the well constructed in compliance with Water Management Board Well Construction Rules, Chapter 74:02:04.
3. 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.
4. That the Kingbrook Rural Water system report to the chief engineer annually the amount of water withdrawn each year from the Vermillion East Fork aquifer.

See the attached report for additional information.

  
JOHN HATCH, Chief Engineer  
August 30, 1988



# Department of Water & Natural Resources

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

August 31, 1988

Volga Tribune  
Box 8  
Volga SD 57071

Dear Sir:

Enclosed is a Notice of Hearings on Application Nos. 5208-3 and 5209-3 to be published twice. Please publish the first notice on or before September 8, 1988 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 Larry Sterling, Kingbrook Rural Water System, Drawer 299, Arlington SD 57212.

A copy of BOTH publications must be SENT to the WATER RIGHTS DIVISION. IMMEDIATELY return the FIRST publication with the FIRST Transmittal form on the bottom of this page. The first copy is needed to check the publication for errors so any corrections can be made in the second publication. Publication errors can invalidate the public notice and cause the applicant costly delays.

Please be sure the SECOND publication is returned IMMEDIATELY with the enclosed Proof of Publication form. DO NOT WAIT until the end of the month or the billing cycle. The permit application cannot be considered by the Water Management Board until proof of publication has been received.

Sincerely,

Ron Duvall  
Natural Resources Engineer  
605 773-3352

enclosures

-----CUT HERE-----

FIRST TRANSMITTAL NOTICE  
No. \_\_\_\_\_

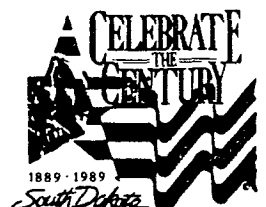
TO: Water Rights Division  
Joe Foss Building  
Pierre SD 57501-3181

Date \_\_\_\_\_

We are in receipt of your letter of \_\_\_\_\_ enclosing Notice of Hearing to  
Appropriate Water by Application No. \_\_\_\_\_ which was first published in our issue  
of \_\_\_\_\_. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Newspaper





# Department of Water & Natural Resources

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

August 31, 1988

Argus Leader  
ATTN: Legal Dept  
Box 5034  
Sioux Falls SD 57117-5034

Dear Sir:

Enclosed is a Notice of Hearings on Application Nos. 5208-3 and 5209-3 to be published twice. Please publish the first notice on or before September 7, 1988 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 Larry Sterling, Kingbrook Rural Water System, Drawer 299, Arlington SD 57212.

A copy of BOTH publications must be SENT to the WATER RIGHTS DIVISION. IMMEDIATELY return the FIRST publication with the FIRST Transmittal form on the bottom of this page. The first copy is needed to check the publication for errors so any corrections can be made in the second publication. Publication errors can invalidate the public notice and cause the applicant costly delays.

Please be sure the SECOND publication is returned IMMEDIATELY with the enclosed Proof of Publication form. DO NOT WAIT until the end of the month or the billing cycle. The permit application cannot be considered by the Water Management Board until proof of publication has been received.

Sincerely,

Ron Duvall  
Natural Resources Engineer  
605 773-3352

enclosures

CUT HERE

FIRST TRANSMITTAL NOTICE

No. \_\_\_\_\_

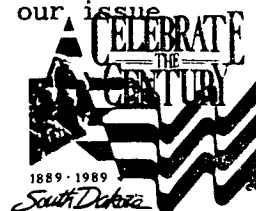
TO: Water Rights Division  
Joe Foss Building  
Pierre SD 57501-3181

Date \_\_\_\_\_

We are in receipt of your letter of \_\_\_\_\_ enclosing Notice of Hearing to  
Appropriate Water by Application No. \_\_\_\_\_ which was first published in our issue  
of \_\_\_\_\_. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

Name \_\_\_\_\_

Newspaper \_\_\_\_\_



 **Department of  
Water & Natural Resources**

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

August 31, 1988

Miner Co. Pioneer  
Box P  
Howard SD 57349

Dear Sir:

Enclosed is a Notice of Hearings on Application Nos. 5208-3 and 5209-3 to be published twice. Please publish the first notice on or before September 8, 1988 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 Larry Sterling, Kingbrook Rural Water System, Drawer 299, Arlington SD 57212.

A copy of BOTH publications must be SENT to the WATER RIGHTS DIVISION. IMMEDIATELY return the FIRST publication with the FIRST Transmittal form on the bottom of this page. The first copy is needed to check the publication for errors so any corrections can be made in the second publication. Publication errors can invalidate the public notice and cause the applicant costly delays.

Please be sure the SECOND publication is returned IMMEDIATELY with the enclosed Proof of Publication form. DO NOT WAIT until the end of the month or the billing cycle. The permit application cannot be considered by the Water Management Board until proof of publication has been received.

Sincerely,



Ron Duvall  
Natural Resources Engineer  
605 773-3352

enclosures

-----CUT HERE-----

FIRST TRANSMITTAL NOTICE

No. \_\_\_\_\_

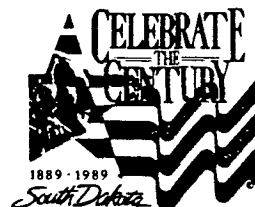
TO: Water Rights Division  
Joe Foss Building  
Pierre SD 57501-3181

Date \_\_\_\_\_

We are in receipt of your letter of \_\_\_\_\_ enclosing Notice of Hearing to  
Appropriate Water by Application No. \_\_\_\_\_ which was first published in our issue  
of \_\_\_\_\_. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Newspaper





# Department of Water & Natural Resources

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

August 31, 1988

Clark Co. Courier  
Box 189  
Clark SD 57225

Dear Sir:

Enclosed is a Notice of Hearings on Application Nos. 5208-3 and 5209-3 to be published twice. Please publish the first notice on or before September 7, 1988 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 Larry Sterling, Kingbrook Rural Water System, Drawer 299, Arlington SD 57212.

A copy of BOTH publications must be SENT to the WATER RIGHTS DIVISION. IMMEDIATELY return the FIRST publication with the FIRST Transmittal form on the bottom of this page. The first copy is needed to check the publication for errors so any corrections can be made in the second publication. Publication errors can invalidate the public notice and cause the applicant costly delays.

Please be sure the SECOND publication is returned IMMEDIATELY with the enclosed Proof of Publication form. DO NOT WAIT until the end of the month or the billing cycle. The permit application cannot be considered by the Water Management Board until proof of publication has been received.

Sincerely,

Ron Duvall  
Natural Resources Engineer  
605 773-3352

enclosures

-----CUT HERE-----

FIRST TRANSMITTAL NOTICE  
No. \_\_\_\_\_

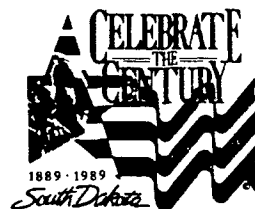
TO: Water Rights Division  
Joe Foss Building  
Pierre SD 57501-3181

Date \_\_\_\_\_

We are in receipt of your letter of \_\_\_\_\_ enclosing Notice of Hearing to  
Appropriate Water by Application No. \_\_\_\_\_ which was first published in our issue  
of \_\_\_\_\_. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Newspaper



 **Department of  
Water & Natural Resources**

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

August 31, 1988

Moody Co. Enterprise  
Box 71  
Flandreau SD 57028

Dear Sir:

Enclosed is a Notice of Hearings on Application Nos. 5208-3 and 5209-3 to be published twice. Please publish the first notice on or before September 7, 1988 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 Larry Sterling, Kingbrook Rural Water System, Drawer 299, Arlington SD 57212.

A copy of BOTH publications must be SENT to the WATER RIGHTS DIVISION. IMMEDIATELY return the FIRST publication with the FIRST Transmittal form on the bottom of this page. The first copy is needed to check the publication for errors so any corrections can be made in the second publication. Publication errors can invalidate the public notice and cause the applicant costly delays.

Please be sure the SECOND publication is returned IMMEDIATELY with the enclosed Proof of Publication form. DO NOT WAIT until the end of the month or the billing cycle. The permit application cannot be considered by the Water Management Board until proof of publication has been received.

Sincerely,



Ron Duvall  
Natural Resources Engineer  
605 773-3352

enclosures

-----CUT HERE-----

FIRST TRANSMITTAL NOTICE

No. \_\_\_\_\_

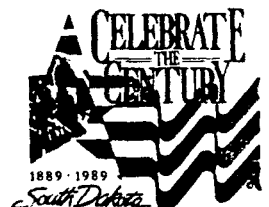
TO: Water Rights Division  
Joe Foss Building  
Pierre SD 57501-3181

Date \_\_\_\_\_

We are in receipt of your letter of \_\_\_\_\_ enclosing Notice of Hearing to  
Appropriate Water by Application No. \_\_\_\_\_ which was first published in our issue  
of \_\_\_\_\_. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Newspaper



 **Department of  
Water & Natural Resources**

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

August 31, 1988

Salem Special  
Box 220  
Salem SD 57058

Dear Sir:

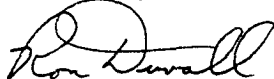
Enclosed is a Notice of Hearings on Application Nos. 5208-3 and 5209-3 to be published twice. Please publish the first notice on or before September 7, 1988 with the second publication 7 days later.

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 Larry Sterling, Kingbrook Rural Water System, Drawer 299, Arlington SD 57212.

A copy of BOTH publications must be SENT to the WATER RIGHTS DIVISION. IMMEDIATELY return the FIRST publication with the FIRST Transmittal form on the bottom of this page. The first copy is needed to check the publication for errors so any corrections can be made in the second publication. Publication errors can invalidate the public notice and cause the applicant costly delays.

Please be sure the SECOND publication is returned IMMEDIATELY with the enclosed Proof of Publication form. DO NOT WAIT until the end of the month or the billing cycle. The permit application cannot be considered by the Water Management Board until proof of publication has been received.

Sincerely,



Ron Duvall  
Natural Resources Engineer  
605 773-3352

enclosures

-----CUT HERE-----

FIRST TRANSMITTAL NOTICE

TO: Water Rights Division  
Joe Foss Building  
Pierre SD 57501-3181

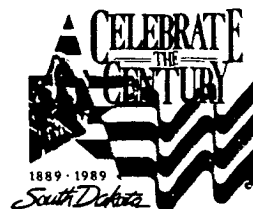
No. \_\_\_\_\_

Date \_\_\_\_\_

We are in receipt of your letter of \_\_\_\_\_ enclosing Notice of Hearing to  
Appropriate Water by Application No. \_\_\_\_\_ which was first published in our issue  
of \_\_\_\_\_. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Newspaper





# Department of Water & Natural Resources

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

August 31, 1988

DeSmet News  
Box 69  
DeSmet SD 57231

Dear Sir:

Enclosed is a Notice of Hearings on Application Nos. 5208-3 and 5209-3 to be published twice. Please publish the first notice on or before September 7, 1988 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 Larry Sterling, Kingbrook Rural Water System, Drawer 299, Arlington SD 57212.

A copy of BOTH publications must be SENT to the WATER RIGHTS DIVISION. IMMEDIATELY return the FIRST publication with the FIRST Transmittal form on the bottom of this page. The first copy is needed to check the publication for errors so any corrections can be made in the second publication. Publication errors can invalidate the public notice and cause the applicant costly delays.

Please be sure the SECOND publication is returned IMMEDIATELY with the enclosed Proof of Publication form. DO NOT WAIT until the end of the month or the billing cycle. The permit application cannot be considered by the Water Management Board until proof of publication has been received.

Sincerely,

Ron Duvall  
Natural Resources Engineer  
605 773-3352

enclosures

-----CUT HERE-----

FIRST TRANSMITTAL NOTICE  
No. \_\_\_\_\_

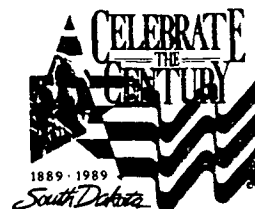
TO: Water Rights Division  
Joe Foss Building  
Pierre SD 57501-3181

Date \_\_\_\_\_

We are in receipt of your letter of \_\_\_\_\_ enclosing Notice of Hearing to  
Appropriate Water by Application No. \_\_\_\_\_ which was first published in our issue  
of \_\_\_\_\_. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Newspaper





# Department of Water & Natural Resources

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

August 31, 1988

Madison Daily Leader  
Box 348  
Madison SD 57042

Dear Sir:

Enclosed is a Notice of Hearings on Application Nos. 5208-3 and 5209-3 to be published twice. Please publish the first notice on or before September 7, 1988 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 Larry Sterling, Kingbrook Rural Water System, Drawer 299, Arlington SD 57212.

A copy of BOTH publications must be SENT to the WATER RIGHTS DIVISION. IMMEDIATELY return the FIRST publication with the FIRST Transmittal form on the bottom of this page. The first copy is needed to check the publication for errors so any corrections can be made in the second publication. Publication errors can invalidate the public notice and cause the applicant costly delays.

Please be sure the SECOND publication is returned IMMEDIATELY with the enclosed Proof of Publication form. DO NOT WAIT until the end of the month or the billing cycle. The permit application cannot be considered by the Water Management Board until proof of publication has been received.

Sincerely,

Ron Duvall  
Natural Resources Engineer  
605 773-3352

enclosures

-----CUT HERE-----

FIRST TRANSMITTAL NOTICE  
No. \_\_\_\_\_

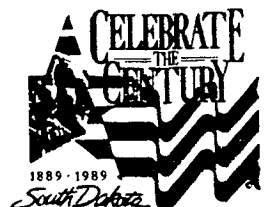
TO: Water Rights Division  
Joe Foss Building  
Pierre SD 57501-3181

Date \_\_\_\_\_

We are in receipt of your letter of \_\_\_\_\_ enclosing Notice of Hearing to  
Appropriate Water by Application No. \_\_\_\_\_ which was first published in our issue  
of \_\_\_\_\_. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Newspaper





# Department of Water & Natural Resources

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

August 31, 1988

Estelline Journal  
Box 8  
Volga SD 57071

Dear Sir:

Enclosed is a Notice of Hearings on Application Nos. 5208-3 and 5209-3 to be published twice. Please publish the first notice on or before September 8, 1988 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 Larry Sterling, Kingbrook Rural Water System, Drawer 299, Arlington SD 57212.

A copy of BOTH publications must be SENT to the WATER RIGHTS DIVISION. IMMEDIATELY return the FIRST publication with the FIRST Transmittal form on the bottom of this page. The first copy is needed to check the publication for errors so any corrections can be made in the second publication. Publication errors can invalidate the public notice and cause the applicant costly delays.

Please be sure the SECOND publication is returned IMMEDIATELY with the enclosed Proof of Publication form. DO NOT WAIT until the end of the month or the billing cycle. The permit application cannot be considered by the Water Management Board until proof of publication has been received.

Sincerely,

Ron Duvall  
Natural Resources Engineer  
605 773-3352

enclosures

-----CUT HERE-----

FIRST TRANSMITTAL NOTICE  
No. \_\_\_\_\_

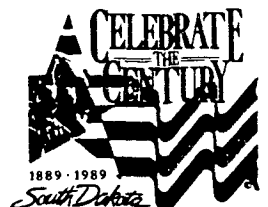
TO: Water Rights Division  
Joe Foss Building  
Pierre SD 57501-3181

Date \_\_\_\_\_

We are in receipt of your letter of \_\_\_\_\_ enclosing Notice of Hearing to  
Appropriate Water by Application Nos. \_\_\_\_\_ which was first published in our issue  
of \_\_\_\_\_. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Newspaper





# Department of Water & Natural Resources

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

August 31, 1988

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

Larry Sterling  
Kingbrook Rural Water System  
Drawer 299  
Arlington SD 57212

Dear Mr. Sterling:

Your Application Nos. 5208-3 and 5209-3 for permits to appropriate water and appropriate water for future use have been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice of your intent to appropriate water has been sent to the following papers:

Argus Leader, Sioux Falls SD  
DeSmet News, DeSmet SD  
Moody Co. Enterprise, Flandreau SD  
Miner Co. Pioneer, Howard SD  
Estelline Journal, Estelline SD

Madison Daily Leader, Madison SD  
Salem Special, Salem SD  
Clark Co. Courier, Clark SD  
Volga Tribune, Volga SD

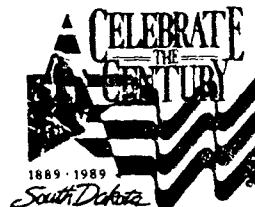
For your information, a copy of the notice, the recommendations of the Chief Engineer and a report on the applications are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

Be sure to contact the above newspapers to authorize publication of your Notice of Intent to Appropriate Water 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. We must receive Proof of Publication before the application can be considered by the Water Management Board.

Sincerely,

Ron Duvall  
Natural Resources Engineer  
605 773-3352

enclosures



Instruction to Newspaper - Publish first Notice on or before \_\_\_\_\_ with 2nd publication 7 days later. The applicant is responsible for payment.

---

NOTICE OF HEARINGS on Application Nos. 5208-3 and 5209-3 to Appropriate Water

Notice is given that the Kingbrook Rural Water System, Drawer 299, Arlington SD 57212 has filed Application Nos. 5208-3 and 5209-3 for water permits. Application No. 5208-3 is to appropriate 1.4 cubic feet of water per second from 2 wells (Vermillion East Fork Aquifer) 50 feet deep to be located in the SW1/4 section 16; NE1/4 section 17; all in T111N-R56W. Water is to be used to supply the Kingbrook Rural Water System. This application also proposes to connect the Cities of Howard and Oldham to the distribution system of the Kingbrook rural water system.

Application No. 5209-3 is to appropriate for future use 2027 acre-feet of water annually from ground water (Vermillion East Fork Aquifer) approximately 50 feet deep. The area reserved for future water use is to be located in the SW1/4SW1/4 section 10; NE1/4 section 8; section 6; all in T111N-R56W. The water is to be reserved for the purpose of providing future water supplies to the rural water system. This application does not authorize construction of works or application of water to beneficial use.

Pursuant to SDCL 46-2A-2, the Chief Engineer of the Water Rights Division recommends APPROVAL of Application No. 5208-3 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.

Pursuant to SDCL 46-2A-2, the Chief Engineer of the Water Rights Division recommends APPROVAL of Future Use Application No. 5209-3 because 1) unappropriated water is available, 2) the quantity of water reserved will be needed, 3) will be a beneficial use of water and 4) it is in the public interest.

These applications will be considered by the Water Management Board in Room 216, Joe Foss Building, 523 E Capitol, Pierre SD on October 5, 1988 at 10:00 am. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer or 4) deny these applications based on the facts presented at the public hearings.

Any interested person that intends to participate in a hearing before the Board by presenting evidence or cross-examining witnesses according to SDCL 1-26, must file a written petition with BOTH the applicant and Chief Engineer by September 23, 1988. The Chief Engineer's address is "Water Rights Division, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)". The petition may be informal, but must include a statement describing the petitioner's interest in an application, the petitioner's reasons for opposing or supporting an application and the signature and mailing address of the petitioner or legal counsel if legal counsel is obtained. The applicant need not file a petition. Contact the Water Rights Division to request information on these applications or to assure access to the hearing by the handicapped.

These hearings are adversary proceedings. Any person filing a petition and/or the applicant have the right to be represented by a lawyer. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. The time of a hearing will also be automatically delayed for at least twenty days upon written request to the Chief Engineer from the applicant or a petitioner. The request for a delay must be received by September 23, 1988.

These applications are made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-15; 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17; 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15; 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2, 46-5-30.4, 46-5-31; 46-6-3, 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14; 46-5-38 thru 46-5-40; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15; 74:02:01:24 thru 74:02:01:25.

See 5209-3 for affidavits  
of publication

**DeWild Grant Reckert & Associates Co.**  
Architecture Engineering and Planning

315 First Avenue  
Rock Rapids, Iowa 51246  
(712) 472-2531



September 7, 1988

Department of Water and Natural Resources  
Office of Drinking Water  
Joe Foss Building  
Pierre, SD 57501-3181

Attn: Garland Erbele

Re: Kingbrook Rural Water System  
Part 1, Subproject 1 of New Member Additions  
Schedule 3 - Well Construction  
DGR File No. 3729

Dear Garland:

Enclosed is a copy of the plans and specifications for the above referenced project for your review.

Financing for the Schedule 3 construction contract will be by Owner contribution and/or with FmHA funds. CDBG contract documents are therefore not included.

Please call me with any questions or comments you may have.

Very truly yours,

DEWILD GRANT RECKERT  
& ASSOCIATES COMPANY

Gary Patton, P.E.

GP:jkv

Enclosure

cc: Morris Elcock  
Al Glover  
Jim Goodman, w/encl. ✓  
Greg Palmer  
Marlene Knutson

CONTRACT DOCUMENTS  
FOR

EXPLORATORY TEST DRILLING  
AND CONSTRUCTION OF  
DESMET WELL NO. 4

KINGBROOK RURAL WATER SYSTEM

September 1988

DeWild Grant Reckert & Assoc. Co.

DGR Project No. 3729

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, \_\_\_\_\_  
\_\_\_\_\_ as Principal, and  
\_\_\_\_\_ as Surety, are hereby  
held and firmly bound unto Kingbrook Rural Water System as OWNER  
in the penal sum of \_\_\_\_\_  
for the payment of which, well and truly to be made, we hereby jointly and  
severally bind ourselves, successors and assigns.

Signed, this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_\_.

The Condition of the above obligation is such that whereas the Principal  
has submitted to Kingbrook Rural Water System a certain  
BID, attached hereto and hereby made a part hereof to enter into a contract in  
writing, for the Exploratory Test Drilling and Construction of DeSmet Well No. 4  
\_\_\_\_\_  
\_\_\_\_\_

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and  
deliver a contract in the Form of Contract attachment hereto (properly  
completed in accordance with said BID) and shall furnish a BOND for  
faithful performance of said contract, and for the payment of all persons  
performing labor furnishing materials in connection therewith, and shall  
in all other respects perform the agreement created by the acceptance  
of said BID, then this obligation shall be void, otherwise the  
same shall remain in force and effect; it being expressly understood  
and agreed that the liability of the Surety for any and all claims  
hereunder shall, in no event, exceed the penal amount of this obligation  
as herein stated.

(1-15-79) SPECIAL PN



The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

\_\_\_\_\_  
(L.S.)

Principal

\_\_\_\_\_  
Surety

By: \_\_\_\_\_

IMPORTANT - Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state of South Dakota.

oOo

COMPLIANCE STATEMENT

This statement relates to a proposed contract with Kingbrook Rural Water System

Arlington, South Dakota

*(Name of borrower or grantee)*

who expects to finance the contract with assistance from the Farmers Home Administration, United States Department of Agriculture (whether by a loan, grant, loan insurance, guarantee, or other form of financial assistance). I am the undersigned bidder or prospective contractor. I represent that -----

1. I ☐ have, ☐ have not, participated in a previous contract or subcontract subject to executive order 11246 (regarding equal employment opportunity) or a preceding similar Executive order.
2. If I have participated in such a contract or subcontract, I ☐ have, ☐ have not, filed all compliance reports that I have been required to file in connection with the contract or subcontract.

If the proposed contract is for \$50,000 or more and I have 50 or more employees, I also represent that ---

3. I ☐ have, ☐ have not previously had contracts subject to the written affirmative action program requirements of the Secretary of Labor.
4. If I have participated in such a contract or subcontract, I ☐ have, ☐ have not, developed and placed on file at each establishment affirmative action programs as required by the rules and regulations of the Secretary of Labor.

I understand that if I have failed to file any compliance reports that have been required of me, I am not eligible and will not be eligible to have my bid considered or to enter into the proposed contract unless and until I make an arrangement regarding such reports that is satisfactory to the Farmers Home Administration or to the office where the reports are required to be filed.

I also certify that I do not maintain or provide for my employees any segregated facilities at any of my establishments, and that I do not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I certify further that I will not maintain or provide for my employees any segregated facilities at any of my establishments, and that I will not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I agree that a breach of this certification is a violation of the Equal Opportunity clause in my contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. I further agree that (except where I have obtained identical certifications for proposed subcontractors for specific time periods) I will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause; that I will retain such certifications in my files; and that I will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods): (See Reverse).

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENTS FOR  
CERTIFICATIONS OF NON-SEGREGATED FACILITIES

A certification of Nonsegregated Facilities, as required by the May 9, 1967, order (32F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Date \_\_\_\_\_

\_\_\_\_\_  
*Signature of Bidder or Prospective Contractor*

\_\_\_\_\_  
*Address (including Zip Code)*

BID

Proposal of \_\_\_\_\_ (hereinafter  
called "BIDDER"), organized and existing under the laws of the State of  
\_\_\_\_\_ doing business as \_\_\_\_\_\*.  
To the Kingbrook Rural Water System  
\_\_\_\_\_ (hereinafter called "OWNER").

In compliance with your Advertisement for Bids, BIDDER hereby proposes  
to perform all WORK for the construction of Exploratory Test Drilling and  
Construction of DeSmet Well No. 4  
in strict accordance with the CONTRACT DOCUMENTS, within the time set forth  
therein, and at the prices stated below.

By submission of this BID, each BIDDER certifies, and in the case of  
a joint BID each party thereto certifies as to its own organization, that  
this BID has been arrived at independently, without consultation, communication,  
or agreement as to any matter relating to this BID with any other BIDDER  
or with any competitor.

BIDDER hereby agrees to commence WORK under this contract on or before  
a date to be specified in the NOTICE TO PROCEED and to fully complete the  
PROJECT ~~within~~ by October 28, 1988 ~~consecutive calendar days thereafter.~~  
BIDDER further agrees to pay as liquidated damages, the sum of \$ 50.00  
for each consecutive calendar day thereafter as provided in Section 15 of  
the General Conditions and as modified by Other Supplemental Conditions.

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

FmHA Instruction 1942-A  
(Guide 19 - Attachment 3)

BIDDER acknowledges receipt of the following ADDENDUM:

---

---

---

BIDDER agrees to perform all the work described in the  
CONTRACT DOCUMENTS for the following unit prices or lump sum:

BID SCHEDULE

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

| <u>Item</u><br><u>No.</u>                            | <u>No. of</u><br><u>Units</u> | <u>Description</u>                                                                                                      | <u>Unit</u><br><u>Price</u> | <u>Total</u><br><u>Cost</u> |
|------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|
| <u>TEST DRILLING AND OBSERVATION WELL BID ITEMS:</u> |                               |                                                                                                                         |                             |                             |
| 1.                                                   | 1 Ea.                         | Test drilling mobiliza-<br>tion, per ea.                                                                                | \$_____                     | \$_____                     |
| 2.                                                   | 480 L.F.                      | Test hole and observation<br>well drilling, including<br>sampling and records,<br>per lin. ft.                          | \$_____                     | \$_____                     |
| 3.                                                   | 360 L.F.                      | Completion of test hole<br>as observation well, in-<br>cluding screen, casing,<br>gravel pack and seal,<br>per lin. ft. | \$_____                     | \$_____                     |
| 4.                                                   | 6 Ea.                         | Observation well devel-<br>opment, water sample<br>collection and disinfec-<br>tion, per ea.                            | \$_____                     | \$_____                     |
| 5.                                                   | 2 Ea.                         | Furnish and install con-<br>crete surface seal and<br>protective posts for per-<br>manent observation wells,<br>per ea. | \$_____                     | \$_____                     |
| 6.                                                   | 4 Ea.                         | Abandonment of observa-<br>tion wells, per ea.                                                                          | \$_____                     | \$_____                     |

| <u>Item No.</u>                   | <u>No. of Units</u> | <u>Description</u>                                                        | <u>Unit Price</u> | <u>Total Cost</u> |
|-----------------------------------|---------------------|---------------------------------------------------------------------------|-------------------|-------------------|
| <u>PRODUCTION WELL BID ITEMS:</u> |                     |                                                                           |                   |                   |
| 7.                                | 1 Ea.               | Production well mobilization, per ea.                                     | \$_____           | \$_____           |
| 8.                                | 60 L.F.             | 20" production well drilling, including samples and records, per lin. ft. | \$_____           | \$_____           |
| 9.                                | 45 L.F.             | 12" steel casing, per lin. ft.                                            | \$_____           | \$_____           |
| 10.                               | 15 L.F.             | 12" stainless steel screen, per lin. ft.                                  | \$_____           | \$_____           |
| 11.                               | 45 L.F.             | Gravel pack, per lin. ft.                                                 | \$_____           | \$_____           |
| 12.                               | 5 L.F.              | Cement grout seal, per lin. ft.                                           | \$_____           | \$_____           |
| 13.                               | Job                 | Production well development, lump sum                                     | \$ <u>L.S.</u>    | \$_____           |
| 14.                               | 1,500 L.F.          | Installation and removal of temporary discharge piping, per lin. ft.      | \$_____           | \$_____           |
| 15.                               | Job                 | Installation and removal of test pump and equipment, lump sum             | \$ <u>L.S.</u>    | \$_____           |
| 16.                               | 72 Hrs.             | Test pumping, observations and records for maximum 72-hour test, per hr.  | \$_____           | \$_____           |
| 17.                               | 12 Hrs.             | Recovery observations and records, per hr.                                | \$_____           | \$_____           |
| 18.                               | Job                 | Collection of water samples, disinfection and cap, lump sum               | \$ <u>L.S.</u>    | \$_____           |
| TOTAL BID                         |                     |                                                                           | \$_____           |                   |

Respectfully submitted:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Address

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
License number (if applicable)

SEAL - (if BID is by a corporation)

CONTRACT DOCUMENTS  
FOR  
EXPLORATORY TEST DRILLING AND  
CONSTRUCTION OF DESMET WELL NO. 4  
KINGBROOK RURAL WATER SYSTEM

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

By   
Gary Patton, P.E.

Registration No. 3612

Date September 6, 1988

DGR Project No. 3729

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

EXPLORATORY TEST DRILLING AND  
CONSTRUCTION OF DESMET WELL NO. 4

KINGBROOK RURAL WATER SYSTEM

TABLE OF CONTENTS

|                                                          | <u>Page No.</u> |
|----------------------------------------------------------|-----------------|
| <u>Advertisement</u>                                     |                 |
| Advertisement for Bids                                   | AB-1 - AB-2     |
| <u>Bid Documents</u>                                     |                 |
| Information for Bidders                                  | 1 - 3           |
| Bid Bond                                                 | 1 - 2           |
| Compliance Statement                                     | 1 - 2           |
| Nonsegregated Facilities Certification                   | 1               |
| Bid                                                      | B-1 - B-4       |
| <u>Contract Documents</u>                                |                 |
| Notice of Award                                          | 1               |
| Agreement                                                | 1 - 4           |
| Performance Bond                                         | 1 - 3           |
| Payment Bond                                             | 1 - 3           |
| Certificate of Insurance                                 | 1               |
| Certificate of Owner's Attorney/<br>Approval of Contract | 1 - 2           |
| Notice to Proceed                                        | 1               |
| <u>Miscellaneous Forms</u>                               |                 |
| Certificate for Payment                                  | 1               |
| Progress Report                                          | 1               |
| Daily Inspection Report                                  | 1               |
| Contract Change Order                                    | 1               |
| Construction Field Order                                 | 1               |
| Waiver and Release of Lien                               | 1               |
| Certificate of Contractor and Indemnity<br>Agreement     | 1 - 2           |
| Memorandum of Substantial Completion                     | 1               |
| Final Inspection and Acceptance                          | 1               |
| Contractor's Receipt for Final Payment                   | 1               |

|                                      | <u>Page No.</u> |
|--------------------------------------|-----------------|
| <u>Contract Conditions</u>           |                 |
| General Conditions                   | 1 - 20          |
| FmHA Supplemental General Conditions | 1 - 8           |
| FmHA South Dakota Attachment 1       | 1 - 4           |
| Other Supplemental Conditions        | SC-1 - SC-6     |

### TECHNICAL SPECIFICATIONS

| <u>Section No.</u>                       | <u>Title</u>                                     | <u>Page No.</u> |
|------------------------------------------|--------------------------------------------------|-----------------|
| <u>DIVISION 1 - GENERAL REQUIREMENTS</u> |                                                  |                 |
| 01010                                    | Summary of Work                                  | 1-1 - 1-3       |
| 01080                                    | Applicable Codes                                 | 1-4             |
| 01090                                    | Permits, Laws and Ordinances                     | 1-5             |
| 01095                                    | Existing Utilities and Under-ground Obstructions | 1-6 - 1-7       |
| 01340                                    | Shop Drawings, Project Data and Samples          | 1-8 - 1-11      |
| 01345                                    | Material Samples and Records                     | 1-12 - 1-15     |
| 01500                                    | Temporary Facilities                             | 1-16            |
| 01710                                    | Protection and Cleaning                          | 1-17 - 1-18     |
| 01760                                    | Measurement and Payment                          | 1-19 - 1-23     |
| <u>DIVISION 2 - SITE WORK</u>            |                                                  |                 |
| 02671                                    | Test Drilling and Observation Wells              | 2-1 - 2-6       |
| 02672                                    | Production Wells                                 | 2-7 - 2-15      |
| 02674                                    | Test for Yield and Drawdown                      | 2-16 - 2-19     |
| 02675                                    | Disinfection and Abandonment                     | 2-20 - 2-24     |
| <u>DIVISIONS 3 THROUGH 16 - NOT USED</u> |                                                  |                 |

| <u>DRAWINGS</u>  | <u>Sheet No.</u> |
|------------------|------------------|
| Location Plan    | 1                |
| Production Well  | 2                |
| Observation Well | 3                |

### APPENDIX

1988 S.D.G.S. Test Hole Logs

ADVERTISEMENT FOR BIDS

ADVERTISEMENT FOR BIDS

Kingbrook Rural Water System  
Drawer 299  
101 West Elm  
Arlington, South Dakota 57212

Separate sealed BIDS for Exploratory Test Drilling and Construction of DeSmet Well No. 4 will be received by Kingbrook Rural Water System, at the Kingbrook Rural Water System Office, Drawer 299, 101 West Elm, Arlington, South Dakota until 7:30 P.M., September 19, 1988 and then at said office publicly opened and read aloud. The proposed well shall consist of the following Schedule of work and approximate quantities and kinds of materials:

Schedule 3:

- A. Test drilling, approximately 8 holes, each approximately 40 to 80 feet deep.
- B. Observation well construction, approximately 6 observation wells, each approximately 40 to 80 feet deep.
- C. Production well, one required, approximately 40 to 80 feet deep.

Date of completion will be October 28, 1988.

Bidders on this work will be required to comply with the Presidents Executive Order Nos. 11246 as amended, 11518, and 11625 as amended. The requirements for bidders and contractors under these orders are explained in the Contract Documents.

The CONTRACT DOCUMENTS may be examined at the following locations:

DeWild Grant Reckert and Associates Company  
315 First Avenue  
Rock Rapids, IA 51246

Kingbrook Rural Water System  
Drawer 299, 101 West Elm  
Arlington, SD 57212

Copies of the CONTRACT DOCUMENTS may be obtained at the office of DeWild Grant Reckert & Associates Company located at 315 First Avenue, Rock Rapids, IA 51246 for a charge of \$15.00 per set. No refunds will be made.

All proposals shall be made on forms provided by the Engineer.

Each bid must be accompanied by bid security payable to the Owner for ten (10%) percent of the total amount of the Bid as a bidder's bond or five (5%) percent of the total amount of the Bid as a cashier's check. As soon as the bid prices have been compared, the Owner will return the check or bond of all except the three lowest, responsive, responsible bidders for each Schedule. When the contract is awarded, the checks or bonds of the two remaining unsuccessful bidders will be returned. The check or bond of the successful bidder will be retained until the contract and surety bond have been executed and approved, after which it will be returned.

With submittal of a Bid, the Contractor represents that he has visited the site, familiarized himself with the local conditions under which the work is to be performed, and correlated his observations with the requirements of the Contract Documents.

The Owner reserves the right to reject any and all bids or to accept any bid. It is understood that the work to be done is being financed by the Farmers Home Administration (FmHA), U.S. Department of Agriculture. Contractor's Proposals shall hold firm for thirty (30) days to allow the Owner to complete its financing arrangements. Mutually agreed upon extensions of time may be made, if necessary.

KINGBROOK RURAL WATER SYSTEM

Date September 7, 1988 By /s/ Larry Sterling  
President

BID DOCUMENTS

INFORMATION FOR BIDDERS

BIDS will be received by Kingbrook Rural Water System  
(herin called the "OWNER"), at 101 West Elm (Hwy. 14), Arlington, SD  
until 7:30 P.M., Sept. 19, 1988, and then at said office publicly  
opened and read aloud.

Each BID must be submitted in a sealed envelope, addressed to Kingbrook Rural Water System at Arlington, South Dakota. Each sealed envelope containing a BID must be plainly marked on the outside as BID for Exploratory Test Drilling and Construction of DeSmet Well No. 4 and the envelope should bear on the outside the BIDDER'S name, address, and license number if applicable, and the name of the project for which the BID is submitted. If forwarded by mail, the sealed envelope containing the BID must be enclosed in another envelope addressed to the OWNER at Kingbrook Rural Water System, Drawer 299, 101 West Elm, Arlington, South Dakota 57212.

All BIDS must be made on the required BID form. All blank spaces for BID prices must be filled in, in ink or typewritten, and the BID form must be fully completed and executed when submitted. Only one copy of the BID form is required.

The OWNER may waive any informalities or minor defects or reject any and all BIDS. Any BID may be withdrawn prior to the above scheduled time for the opening of BIDS or authorized postponement thereof. Any BID received after the time and date specified shall not be considered. No BIDDER may withdraw a BID within 30 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the OWNER and the BIDDER.

BIDDERS must satisfy themselves of the accuracy of the estimated quantities in the BID Schedule by examination of the site and a review of the drawings and specifications including ADDENDA. After BIDS have been submitted, the BIDDER shall not assert that there was a misunderstanding concerning the quantities of WORK or of the nature of the WORK to be done.

The OWNER shall provide to BIDDERS prior to BIDDING, all information which is pertinent to, and delineates and describes, the land owned and rights-of-way acquired or to be acquired.

The CONTRACT DOCUMENTS contain the provisions required for the construction of the PROJECT. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve the contractor from fulfilling any of the conditions of the contract.

Each BID must be accompanied by a BID <sup>Security</sup> payable to the OWNER for \* of the total amount of the BID. As soon as the BID prices have been compared, the OWNER will return the BONDS of all except the three lowest responsible BIDDERS. When the Agreement is executed the bonds of the two remaining unsuccessful BIDDERS will be returned. The BID BOND of the successful BIDDER will be retained until the payment BOND and performance BOND have been executed and approved, after which it will be returned. A certified check may be used in lieu of a BID BOND.

A performance BOND and a payment BOND each in the amount of 100 percent of the CONTRACT PRICE, with a corporate surety approved by the OWNER, will be required for the faithful performance of the contract.

Attorneys-in-fact who sign BID BONDS or payment BONDS and performance BONDS must file with each BOND a certified and effective dated copy of their power of attorney.

The party to whom the contract is awarded will be required to execute the Agreement and obtain the performance BOND and payment BOND within ten (10) calendar days from the date when NOTICE OF AWARD is delivered to the BIDDER. The NOTICE OF AWARD shall be accompanied by the necessary Agreement and BOND forms. In case of failure of the BIDDER to execute the Agreement, the OWNER may consider the BIDDER in default, in which case the BID BOND accompanying the proposal shall become the property of the OWNER.

The OWNER within ten (10) days of receipt of acceptable performance BOND, payment BOND and Agreement signed by the party to whom the Agreement was awarded shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the OWNER not execute the Agreement within such period, the BIDDER may by WRITTEN NOTICE withdraw the signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the OWNER.

The NOTICE TO PROCEED shall be issued within ten (10) days of the execution of the Agreement by the OWNER. Should there be reasons why the NOTICE TO PROCEED cannot be issued within such period, the time may be extended by mutual agreement between the OWNER AND CONTRACTOR. If the NOTICE TO PROCEED has not been issued within the ten (10) day period or within the period mutually agreed upon, the CONTRACTOR may terminate the Agreement without further liability on the part of either party.

The OWNER may make such investigations as deemed necessary to determine the ability of the BIDDER to perform the WORK, and the BIDDER shall furnish to the OWNER all such information and data for this purpose as the OWNER

\*Five percent (5%) as a cashier's check, or ten percent (10%) as a Bid Bond.

may request. The OWNER reserves the right to reject any BID if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the OWNER that such BIDDER is properly qualified to carry out the obligations of the Agreement and to complete the WORK contemplated therein.

A conditional or qualified BID will not be accepted.

Award will be made to the lowest, responsive, responsible BIDDER.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the PROJECT shall apply to the contract throughout.

Each BIDDER is responsible for inspecting the site and for reading and being thoroughly familiar with the CONTRACT DOCUMENTS. The failure or omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to its BID. The submission of a bid will constitute an incontrovertible representation by the BIDDER that he has (a) examined the Contract Documents thoroughly, (b) visited the site to familiarize himself with local conditions affecting the work and performed all subsurface investigations which he has deemed necessary, (c) familiarized himself with federal, state and local laws, ordinances, rules and regulations that may in any manner affect cost, progress or performance of the Work, and (d) studied and carefully correlated his observations with the Contract Documents. No reports of subsurface conditions are a part of the Contract Documents, nor are they guaranteed as to accuracy or completeness.

Further, the BIDDER agrees to abide by the requirements under Executive Order No. 11246, as amended, including specifically the provisions of the equal opportunity clause set forth in the SUPPLEMENTAL GENERAL CONDITIONS.

The low BIDDER shall supply the names and addresses of major material SUPPLIERS and SUBCONTRACTORS when requested to do so by the OWNER.

The ENGINEER is DeWild Grant Reckert and Associates Company. His address is 315 1st Avenue, Rock Rapids, Iowa 51246. Phone number is (712)472-2531.

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, \_\_\_\_\_  
\_\_\_\_\_ as Principal, and  
\_\_\_\_\_ as Surety, are hereby  
held and firmly bound unto Kingbrook Rural Water System as OWNER  
in the penal sum of \_\_\_\_\_  
for the payment of which, well and truly to be made, we hereby jointly and  
severally bind ourselves, successors and assigns.

Signed, this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_\_.

The Condition of the above obligation is such that whereas the Principal  
has submitted to Kingbrook Rural Water System a certain  
BID, attached hereto and hereby made a part hereof to enter into a contract in  
writing, for the Exploratory Test Drilling and Construction of DeSmet Well No. 4  
\_\_\_\_\_  
\_\_\_\_\_

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and  
deliver a contract in the Form of Contract attachment hereto (properly  
completed in accordance with said BID) and shall furnish a BOND for  
faithful performance of said contract, and for the payment of all persons  
performing labor furnishing materials in connection therewith, and shall  
in all other respects perform the agreement created by the acceptance  
of said BID, then this obligation shall be void, otherwise the  
same shall remain in force and effect; it being expressly understood  
and agreed that the liability of the Surety for any and all claims  
hereunder shall, in no event, exceed the penal amount of this obligation  
as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

\_\_\_\_\_  
Principal (L.S.)

\_\_\_\_\_  
Surety

By: \_\_\_\_\_

IMPORTANT - Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state of South Dakota.

## COMPLIANCE STATEMENT

This statement relates to a proposed contract with Kingbrook Rural Water System

Arlington, South Dakota

(Name of borrower or grantee)

who expects to finance the contract with assistance from the Farmers Home Administration, United States Department of Agriculture (whether by a loan, grant, loan insurance, guarantee, or other form of financial assistance). I am the undersigned bidder or prospective contractor. I represent that -----

1. I ☐ have, ☐ have not, participated in a previous contract or subcontract subject to executive order 11246 (regarding equal employment opportunity) or a preceding similar Executive order.
2. If I have participated in such a contract or subcontract, I ☐ have, ☐ have not, filed all compliance reports that I have been required to file in connection with the contract or subcontract.

If the proposed contract is for \$50,000 or more and I have 50 or more employees, I also represent that ---

3. I ☐ have, ☐ have not previously had contracts subject to the written affirmative action program requirements of the Secretary of Labor.
4. If I have participated in such a contract or subcontract, I ☐ have, ☐ have not, developed and placed on file at each establishment affirmative action programs as required by the rules and regulations of the Secretary of Labor.

I understand that if I have failed to file any compliance reports that have been required of me, I am not eligible and will not be eligible to have my bid considered or to enter into the proposed contract unless and until I make an arrangement regarding such reports that is satisfactory to the Farmers Home Administration or to the office where the reports are required to be filed.

I also certify that I do not maintain or provide for my employees any segregated facilities at any of my establishments, and that I do not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I certify further that I will not maintain or provide for my employees any segregated facilities at any of my establishments, and that I will not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I agree that a breach of this certification is a violation of the Equal Opportunity clause in my contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. I further agree that (except where I have obtained identical certifications for proposed subcontractors for specific time periods) I will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause; that I will retain such certifications in my files; and that I will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods): (See Reverse).

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENTS FOR  
CERTIFICATIONS OF NON-SEGREGATED FACILITIES

A certification of Nonsegregated Facilities, as required by the May 9, 1967, order (32F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Date \_\_\_\_\_

\_\_\_\_\_  
*Signature of Bidder or Prospective Contractor*

\_\_\_\_\_  
*Address (including Zip Code)*

BID

Proposal of \_\_\_\_\_ (hereinafter called "BIDDER"), organized and existing under the laws of the State of \_\_\_\_\_ doing business as \_\_\_\_\_\*.

To the Kingbrook Rural Water System  
\_\_\_\_\_ (hereinafter called "OWNER").

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all WORK for the construction of Exploratory Test Drilling and Construction of DeSmet Well No. 4

in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID each party thereto certifies as to its own organization, that this BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this contract on or before a date to be specified in the NOTICE TO PROCEED and to fully complete the PROJECT ~~within~~ by October 28, 1988 ~~consequently/delays/undelays~~. BIDDER further agrees to pay as liquidated damages, the sum of \$ 50.00 for each consecutive calendar day thereafter as provided in Section 15 of the General Conditions and as modified by Other Supplemental Conditions.

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

FmHA Instruction 1942-A  
(Guide 19 - Attachment 3)

BIDDER acknowledges receipt of the following ADDENDUM:

---

---

---

BIDDER agrees to perform all the work described in the  
CONTRACT DOCUMENTS for the following unit prices or lump sum:

BID SCHEDULE

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

| <u>Item</u><br><u>No.</u>                            | <u>No. of</u><br><u>Units</u> | <u>Description</u>                                                                                                      | <u>Unit</u><br><u>Price</u> | <u>Total</u><br><u>Cost</u> |
|------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|
| <u>TEST DRILLING AND OBSERVATION WELL BID ITEMS:</u> |                               |                                                                                                                         |                             |                             |
| 1.                                                   | 1 Ea.                         | Test drilling mobiliza-<br>tion, per ea.                                                                                | \$_____                     | \$_____                     |
| 2.                                                   | 480 L.F.                      | Test hole and observation<br>well drilling, including<br>sampling and records,<br>per lin. ft.                          | \$_____                     | \$_____                     |
| 3.                                                   | 360 L.F.                      | Completion of test hole<br>as observation well, in-<br>cluding screen, casing,<br>gravel pack and seal,<br>per lin. ft. | \$_____                     | \$_____                     |
| 4.                                                   | 6 Ea.                         | Observation well devel-<br>opment, water sample<br>collection and disinfect-<br>tion, per ea.                           | \$_____                     | \$_____                     |
| 5.                                                   | 2 Ea.                         | Furnish and install con-<br>crete surface seal and<br>protective posts for per-<br>manent observation wells,<br>per ea. | \$_____                     | \$_____                     |
| 6.                                                   | 4 Ea.                         | Abandonment of observa-<br>tion wells, per ea.                                                                          | \$_____                     | \$_____                     |

| <u>Item No.</u>                   | <u>No. of Units</u> | <u>Description</u>                                                        | <u>Unit Price</u> | <u>Total Cost</u> |
|-----------------------------------|---------------------|---------------------------------------------------------------------------|-------------------|-------------------|
| <u>PRODUCTION WELL BID ITEMS:</u> |                     |                                                                           |                   |                   |
| 7.                                | 1 Ea.               | Production well mobilization, per ea.                                     | \$_____           | \$_____           |
| 8.                                | 60 L.F.             | 20" production well drilling, including samples and records, per lin. ft. | \$_____           | \$_____           |
| 9.                                | 45 L.F.             | 12" steel casing, per lin. ft.                                            | \$_____           | \$_____           |
| 10.                               | 15 L.F.             | 12" stainless steel screen, per lin. ft.                                  | \$_____           | \$_____           |
| 11.                               | 45 L.F.             | Gravel pack, per lin. ft.                                                 | \$_____           | \$_____           |
| 12.                               | 5 L.F.              | Cement grout seal, per lin. ft.                                           | \$_____           | \$_____           |
| 13.                               | Job                 | Production well development, lump sum                                     | \$ L.S. _____     | \$_____           |
| 14.                               | 1,500 L.F.          | Installation and removal of temporary discharge piping, per lin. ft.      | \$_____           | \$_____           |
| 15.                               | Job                 | Installation and removal of test pump and equipment, lump sum             | \$ L.S. _____     | \$_____           |
| 16.                               | 72 Hrs.             | Test pumping, observations and records for maximum 72-hour test, per hr.  | \$_____           | \$_____           |
| 17.                               | 12 Hrs.             | Recovery observations and records, per hr.                                | \$_____           | \$_____           |
| 18.                               | Job                 | Collection of water samples, disinfection and cap, lump sum               | \$ L.S. _____     | \$_____           |
| TOTAL BID                         |                     |                                                                           | \$_____           |                   |

Respectfully submitted:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Address

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
License number (if applicable)

SEAL - (if BID is by a corporation)

CONTRACT DOCUMENTS

NOTICE OF AWARD

TO: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

PROJECT Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated \_\_\_\_\_, 19\_\_\_\_\_, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of \$ \_\_\_\_\_.

You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER's acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_.

\_\_\_\_\_  
Owner

By \_\_\_\_\_

Title \_\_\_\_\_

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

by \_\_\_\_\_  
this the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_.  
By \_\_\_\_\_  
Title \_\_\_\_\_

AGREEMENT

THIS AGREEMENT, made this \_\_\_\_\_ day of \_\_\_\_\_, 19 \_\_\_\_, by  
and between \_\_\_\_\_, hereinafter called "OWNER"  
(name of Owner), (an Individual)

and \_\_\_\_\_ doing business as (an individual,) or (a partnership,) or (a corporation) hereinafter called "CONTRACTOR".

WITNESSETH: That for and in consideration of the payments and agreements herein after mentioned:

1. The CONTRACTOR will commence and complete the construction of

---

2. The CONTRACTOR will furnish all of the materials, supplies, tools, equipment, labor, and other services necessary for the construction and completion of the PROJECT described herein.

3. The CONTRACTOR will commence the work required by the CONTRACT DOCUMENTS within \_\_\_\_\_ calendar days after the date of the NOTICE TO PROCEED and will complete the same within \_\_\_\_\_ calendar days unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS.

4. The CONTRACTOR agrees to perform all of the WORK described in the CONTRACT DOCUMENTS and comply with the terms therein for the sum of \$ \_\_\_\_\_ or as shown in the BID schedule.

5. The term "CONTRACT DOCUMENTS" MEANS and includes the following:

- [illegible]

6. The OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.

7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

IN WITNESS WHEREOF, the parties hereto have executed or caused to be executed by their duly authorized officials, this Agreement in  
( ) copies each of which shall be deemed an original on the  
(Number of Copies)  
date first above written.

OWNER:

BY

Name

(Please Type)

Title

(SEAL)

ATTEST:

Name

(Please Type)

Title

CONTRACTOR:

\_\_\_\_\_

BY \_\_\_\_\_

Name \_\_\_\_\_  
(Please Type)

Address \_\_\_\_\_  
\_\_\_\_\_

(SEAL)

ATTEST:

\_\_\_\_\_

Name \_\_\_\_\_  
(Please Type)

\_\_\_\_\_

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Address of Contractor)

a \_\_\_\_\_, hereinafter called Principal, and  
(Corporation, Partnership, or Individual)

\_\_\_\_\_  
(Name of Surety)

\_\_\_\_\_  
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto \_\_\_\_\_

\_\_\_\_\_  
(Name of Owner)

\_\_\_\_\_  
(Address of Owner)

hereinafter called OWNER, and the United States of America acting through the  
Farmers Home Administration hereinafter referred to as the Government in the  
total aggregate penal sum of \_\_\_\_\_

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

in lawful money of the United States, for the payment of which sum well and truly  
to be made, we bind ourselves, our heirs, executors, administrators, successors,  
and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into  
a certain contract with the OWNER, dated the \_\_\_\_\_ day of \_\_\_\_\_  
19\_\_\_\_\_, a copy of which is hereto attached and made a part hereof for the  
construction of:

(5-23-79) PN 675

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, or GOVERNMENT, with or without notice to the SURETY and during the one year guaranty period and if the PRINCIPAL shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER and GOVERNMENT from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER and GOVERNMENT all outlay and expense which the OWNER and GOVERNMENT may incur in making good any default, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the liability of the PRINCIPAL AND SURETY hereunder to the GOVERNMENT shall be subject to the same limitations and defenses as may be available to them against a claim hereunder by the OWNER, provided, however, that the GOVERNMENT may, at its option, perform any obligations of the OWNER required by the contract.

PROVIDED, FURTHER, that the said SURETY, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that it is expressly agreed that the BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the CONTRACT as so amended. The term "Amendment", wherever used in this BOND, and whether referring to this BOND, the Contract or the Loan Documents shall include any alteration, addition, extension, or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER or GOVERNMENT and the PRINCIPAL shall abridge the right of the other beneficiary hereunder, whose claim may be unsatisfied. The OWNER and GOVERNMENT are the only beneficiaries hereunder.

IN WITNESS WHEREOF, this instrument is executed in \_\_\_\_\_ counterparts, each  
one of which shall be deemed an original, this the \_\_\_\_\_ Number \_\_\_\_\_ day of \_\_\_\_\_

ATTEST:

\_\_\_\_\_  
Principal

\_\_\_\_\_  
(Principal) Secretary

(SEAL)

By \_\_\_\_\_ (s)

\_\_\_\_\_  
(Witness as to Principal)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
Surety

ATTEST:

\_\_\_\_\_  
Witness to Surety

BY \_\_\_\_\_  
Attorney-in-Fact

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(Address)

NOTE: Date of BOND must not be prior to date of Contract.

If CONTRACTOR is partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

oOo

(5-23-79) PN 675

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Address of Contractor)

a \_\_\_\_\_, hereinafter called PRINCIPAL and  
(Corporation, Partnership or Individual)

\_\_\_\_\_  
(Name of Surety)

hereinafter called SURETY, are held and firmly bound unto \_\_\_\_\_

\_\_\_\_\_  
(Name of Owner)

\_\_\_\_\_  
(Address of Owner)

hereinafter called OWNER and the United States of America acting through  
the Farmers Home Administration hereinafter referred to as GOVERNMENT, and  
unto all persons, firms, and corporations who or which may furnish labor,  
or who furnish materials to perform as described under the contract and to  
their successors and assigns in the total aggregate penal sum of \_\_\_\_\_

Dollars (\$ \_\_\_\_\_)

in lawful money of the United States, for the payment of which sum well  
and truly to be made, we bind ourselves, our heirs, executors, administrators,  
successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the PRINCIPAL entered  
into a certain contract with the OWNER, dated the \_\_\_\_\_ day of  
\_\_\_\_ 19\_\_\_\_, a copy of which is hereto attached and made a part hereof for  
the construction of:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
NOW, THEREFORE, if the PRINCIPAL shall promptly make payment to all persons,  
firms, and corporations furnishing materials for or performing labor in the  
prosecution of the WORK provided for in such contract, and any authorized  
extensions or modification thereof, including all amounts due for materials,  
lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and  
tools, consumed or used in connection with the construction of such WORK, and  
for all labor cost incurred in such WORK including that by a SUBCONTRACTOR, and  
to any mechanic or materialman lienholder whether it acquires its lien by  
operation of State or Federal law; then this obligation shall be void, otherwise  
to remain in full force and effect.

PROVIDED, that beneficiaries or claimants hereunder shall be limited to the SUBCONTRACTORS, and persons, firms, and corporations having a direct contract with the PRINCIPAL or its SUBCONTRACTORS.

PROVIDED, FURTHER, that the said SURETY for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of this contract or to the WORK or to the SPECIFICATIONS.

PROVIDE, FURTHER, that no suit or action shall be commenced hereunder by any claimant: (a) Unless claimant, other than one having a direct contract with the PRINCIPAL (or with the GOVERNMENT in the event the GOVERNMENT is performing the obligations of the OWNER), shall have given written notice to any two of the following: The PRINCIPAL, the OWNER, or the SURETY above named within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the PRINCIPAL, OWNER, or SURETY, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer. (b) After the expiration of one (1) year following the date of which PRINCIPAL ceased work on said CONTRACT, is being understood, however, that if any limitation embodied in the BOND is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

PROVIDED, FURTHER, that it is expressly agreed that this BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the Contract as so amended. The term "Amendment", wherever used in this BOND and whether referring to this BOND, the contract or the loan Documents shall include any alteration, addition, extension or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER or GOVERNMENT and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

WITNESS WHEREOF, this instrument is executed in \_\_\_\_\_ counterparts, each of  
which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_.

ATTEST:

\_\_\_\_\_  
(Principal) Secretary

(SEAL)

\_\_\_\_\_  
Witness as to Principal  
\_\_\_\_\_  
(Address)

ATTEST:

\_\_\_\_\_  
Witness as to Surety  
\_\_\_\_\_  
(Address)

\_\_\_\_\_  
Principal

By \_\_\_\_\_ (s)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
Surety

By \_\_\_\_\_  
Attorney-in-Fact

\_\_\_\_\_  
(Address)

NOTE: Date of BOND must not be prior to date of Contract.

If CONTRACTOR Is partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the Project is located.

oOo

# CERTIFICATE OF INSURANCE

THIS IS TO CERTIFY, that policies in the name of \_\_\_\_\_  
 (Name and Address of Insured)  
 are in force on the date hereof, as follows:

| Kind of Policy                                                     | Policy No. | Policy Period | Limits of Liability                                   |                                  |
|--------------------------------------------------------------------|------------|---------------|-------------------------------------------------------|----------------------------------|
|                                                                    |            |               | bodily Injury                                         | Property Damage                  |
| Workmen's Compensation                                             |            | Eff.<br>Exp.  | Provided by Workmen's<br>Compensation Law<br>State Of | NIL                              |
| Auto or Vehicular<br>Liability                                     |            | Eff.<br>Exp.  | Each person \$<br>Each accident \$                    | Each accident \$                 |
| Builder's Risk                                                     |            | Eff.<br>Exp.  | NIL                                                   | Aggregate \$                     |
| Comprehensive General<br>Liability with<br>Contractual Endorsement |            | Eff.<br>Exp.  | Each person \$<br>Each accident \$                    | Each accident \$<br>Aggregate \$ |
| Other                                                              |            |               |                                                       |                                  |

Certificate issued to \_\_\_\_\_ at \_\_\_\_\_  
 (Name of City or Association) (Address)

In the event of cancellation of said policies or a reduction in the limits of liability, the surety company will give fifteen (15) days written notice to the party to whom this certificate is issued and to the Farmers Home Administration.

Surety Company

Date \_\_\_\_\_ By \_\_\_\_\_  
 Authorized Representative

Certification of Owner's Attorney

I, the undersigned, \_\_\_\_\_, the duly authorized and acting legal representative of \_\_\_\_\_, do hereby certify as follows:

I have examined the attached contract(s) and performance and payment bond(s) and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements are adequate and have has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions, and provisions thereof.

\_\_\_\_\_  
Date \_\_\_\_\_

NOTE: Delete phrase "performance and payment bonds" when not applicable.

FmHA Concurrence

As lender or insurer of funds to defray the costs of this contract, and without liability for any payments thereunder, the Farmers Home Administration (FmHA) hereby concurs in the award of this CONTRACT to

---

U.S. Department of Agriculture  
Farmers Home Administration

By \_\_\_\_\_

Title \_\_\_\_\_

Date \_\_\_\_\_

This CONTRACT shall not be effective unless and until concurred in by the State Director of the Farmers Home Administration, U.S. Department of Agriculture or a delegated representative.

NOTICE TO PROCEED

TO: \_\_\_\_\_ DATE: \_\_\_\_\_  
\_\_\_\_\_  
Project: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

You are hereby notified to commence WORK in accordance with the Agreement dated \_\_\_\_\_, 19\_\_\_\_, on or before \_\_\_\_\_, 19\_\_\_\_, and you are to complete the WORK within \_\_\_\_\_ consecutive calendar days thereafter. The date of completion of all WORK is therefore \_\_\_\_\_, 19\_\_\_\_.

\_\_\_\_\_  
Owner  
By \_\_\_\_\_  
Title \_\_\_\_\_

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by \_\_\_\_\_

\_\_\_\_\_,  
this the \_\_\_\_\_, 19\_\_\_\_

\_\_\_\_\_  
By \_\_\_\_\_  
Title \_\_\_\_\_

Employer Identification  
Number \_\_\_\_\_

oOo

MISCELLANEOUS FORMS

CERTIFICATE FOR PAYMENT

Issue Date: \_\_\_\_\_ Certificate No.: \_\_\_\_\_  
Contractor: \_\_\_\_\_ Period From: \_\_\_\_\_ To: \_\_\_\_\_  
Owner: \_\_\_\_\_ Date of Contract: \_\_\_\_\_  
Project: \_\_\_\_\_ Date of Construction Start: \_\_\_\_\_  
Estimated Percentage of Job Complete: \_\_\_\_\_ Completion Date: \_\_\_\_\_  
Is Contractor's Construction Progress on Schedule? \_\_\_\_\_

Original Contract Sum \_\_\_\_\_  
Previous Change Orders \_\_\_\_\_  
Current Change Order No. \_\_\_\_\_  
Current Contract Amount \_\_\_\_\_  
Due Contractor to Date \_\_\_\_\_  
Less Retainage \_\_\_\_\_  
Less Previous Payment \_\_\_\_\_  
THIS CERTIFICATE \_\_\_\_\_

Contractor's Certificate:

The undersigned Contractor certifies that (1) all previous payments by Owner have been used to pay for obligations of Contractor under this contract; (2) title to all materials and equipment incorporated in the Work or stored at the site will pass to the Owner at the time of payment free and clear of any liens or claims; (3) the Work has been completed in accordance with the Contract Documents; (4) all Labor Standards Requirements have been fulfilled by the Contractor and all subcontractors under this contract; and (5) Contractor is entitled to payment under the terms of the Contract.

By \_\_\_\_\_ Date \_\_\_\_\_

Engineer's Certificate:

I hereby certify that I have reviewed this Certificate for Payment and that, based on on-site observations and to the best of my knowledge and belief, the quantities shown in this estimate are correct and the Work is in accordance with the Contract Documents.

DeWild Grant Reckert and Associates Co.

By \_\_\_\_\_ Date \_\_\_\_\_

Owner's Certificate:

I hereby certify that I have reviewed this Certificate for Payment and that payment of the amount shown for This Certificate has been approved by the governing body of the Owner.

By \_\_\_\_\_ Date \_\_\_\_\_

Accepted by FmHA Representative:

Acceptance of pay estimates by FmHA does not attest to the correctness of the quantities shown or that the work has been performed in accordance with the Plans and Specifications.

By \_\_\_\_\_ Date \_\_\_\_\_

PROGRESS REPORT  
FOR

Month of \_\_\_\_\_, 19\_\_\_\_

From: \_\_\_\_\_

To: \_\_\_\_\_

Re: \_\_\_\_\_

Current Status of Construction: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Progress Completed During Last Month: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Construction Problems - Existing or Anticipated: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Planned Construction for Next Month: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Remarks: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Submitted by \_\_\_\_\_

Date \_\_\_\_\_

DAILY INSPECTION REPORT

Job No. \_\_\_\_\_  
(1)

Borrower Information

\_\_\_\_\_

Date \_\_\_\_\_

Street \_\_\_\_\_ County \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Report No. \_\_\_\_\_  
(2)

Project Information

Type of Project \_\_\_\_\_ Project Location \_\_\_\_\_

Contractor(s) Name \_\_\_\_\_ Superintendent \_\_\_\_\_

Weather Conditions \_\_\_\_\_

Description of Work Accomplished \_\_\_\_\_

Items of Interest Occurred \_\_\_\_\_

Delays or Work Restraining Orders \_\_\_\_\_

Change Orders \_\_\_\_\_

Additional Remarks \_\_\_\_\_  
(include problems, delays and controversies on orders)

\_\_\_\_\_  
Resident Project Representative

By \_\_\_\_\_

Note to Resident Inspector:

The original Daily Inspection Report shall be submitted to the borrower at intervals not exceeding one (1) week with copies of the report furnished the project engineer, Contractor(s) and FmHA County Supervisor.

(1) Assigned by FmHA.

(2) Assigned by Resident Inspector in consecutive order beginning with No. 1.

# CONTRACT CHANGE ORDER

CONTRACT FOR

OWNER

ORDER NO.

DATE

STATE

COUNTY

To

(Contractor)

You are hereby requested to comply with the following changes from the contract plans and specifications:

| Description of Changes<br>(Supplemental Plans and Specifications Attached) | DECREASE<br>in Contract Price | INCREASE<br>in Contract Price |
|----------------------------------------------------------------------------|-------------------------------|-------------------------------|
|                                                                            | \$                            | \$                            |
|                                                                            |                               |                               |
|                                                                            |                               |                               |
|                                                                            |                               |                               |
| TOTALS                                                                     | \$                            |                               |
| NET CHANGE IN CONTRACT PRICE                                               | \$                            |                               |

JUSTIFICATION:

The amount of the Contract will be (Decreased) (Increased) By The Sum Of: \_\_\_\_\_

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_).

The Contract Total Including this and previous Change Orders Will Be: \_\_\_\_\_

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_).

The Contract Period Provided for Completion Will Be (Increased) (Decreased) (Unchanged): \_\_\_\_\_ Days

This document will become a supplement to the contract and all provisions will apply hereto.

Requested \_\_\_\_\_ (Owner) \_\_\_\_\_ (Date)

Recommended \_\_\_\_\_ (Owner's Architect/Engineer) \_\_\_\_\_ (Date)

Accepted \_\_\_\_\_ (Contractor) \_\_\_\_\_ (Date)

Approved By FmHA \_\_\_\_\_ (Name and Title) \_\_\_\_\_ (Date)

This information will be used as a record of any changes to the original construction contract.

CONSTRUCTION FIELD ORDER

Project: \_\_\_\_\_

Project No. \_\_\_\_\_

OWNER: \_\_\_\_\_

Order No. \_\_\_\_\_

Contract Date: \_\_\_\_\_

Order Date: \_\_\_\_\_

To:

From:

You are hereby directed to execute promptly this Field Order which interprets the Contract Documents or orders minor changes in the Work without change in Contract Sum or Contract Time.

If you consider that a change in Contract Sum or Contract Time is required, please submit your itemized proposal together with this Construction Field Order to the Resident Project Representative and Architect/Engineer immediately and before proceeding with this Work. If your proposal is found to be satisfactory and in proper order, this Field Order will be executed and superseded by a Change Order.

Description: (Here insert a written description of the interpretation or change)

Attachments: (Here insert listing of attached documents that support description)

SCHEDULE CONTRACTOR

By \_\_\_\_\_

By \_\_\_\_\_

WAIVER AND RELEASE OF LIEN

WHEREAS, the undersigned, \_\_\_\_\_

NAME OF MANUFACTURER, MATERIALMAN OR SUBCONTRACTOR

has furnished to \_\_\_\_\_ the following:

NAME OF CONTRACTOR

\_\_\_\_\_ for use in the construction of a project belonging

KIND OF MATERIAL AND SERVICES FURNISHED

to \_\_\_\_\_, and designated as,

NAME OF OWNER

\_\_\_\_\_

NAME OF PROJECT

NOW, THEREFORE, the undersigned, \_\_\_\_\_

NAME OF MANUFACTURER, MATERIALMAN OR SUBCONTRACTOR

for and in consideration of \$\_\_\_\_\_, and other good and valuable consideration, the receipt whereof is hereby acknowledged, do (es) hereby waive and release any and all liens, or right to or claim of lien, on the above described project and premises, under any law, common or statutory, on account of labor or materials, or both, heretofore or hereafter furnished by the undersigned to or for the account of said

\_\_\_\_\_ for said project.

NAME OF CONTRACTOR

Given under my (our) hand (s) and seal (s) this \_\_\_\_\_ day of \_\_\_\_\_,

19\_\_\_\_\_.

NAME OF MANUFACTURER, MATERIALMAN OR SUBCONTRACTOR

By \_\_\_\_\_

# CERTIFICATE OF CONTRACTOR AND INDEMNITY AGREEMENT

\_\_\_\_\_, certifies that he is the \_\_\_\_\_  
 Title or Designation  
 of \_\_\_\_\_, the Contractor,  
 Name of Contractor  
 in a contract No. \_\_\_\_\_ dated \_\_\_\_\_, entered into between the  
 Contractor and \_\_\_\_\_  
 Name of Owner  
 the Owner, for the construction of \_\_\_\_\_  
 Name of Project

and that he is authorized to and does make this Certificate and Indemnity Agreement on behalf of the Contractor in order to induce the Owner to make payment to the Contractor, in accordance with the provisions of the Contract. Undersigned further certifies that:

1. The Project has been completed in accordance with provisions of the Construction Contract; provided however, that acceptance by the Owner shall not be deemed to relieve the Contractor of his obligations contained in the Construction Contract with respect to defective workmanship and materials discovered within \_\_\_\_\_ year(s) after the date of completion.

2. All persons who have furnished labor in connection with the Project have been paid in full at hourly wage rates not less than those, if any, set forth in the Construction Contract; that all manufacturers, materialmen and subcontractors which furnished any materials or services, or both, for the Project have been paid in full; that no lien has been filed against the Project and no person has any right to claim any lien against the Project.

3. That the Contractor has delivered to the Owner duplicate releases of liens executed by all manufacturers, materialmen and subcontractors that furnished materials or services for the project as follows:

Name

Kind of Material and Services

[illegible]

If the Owner pays the Contractor the total amount due under the Contract, which the Contractor agrees is \$\_\_\_\_\_, including \$\_\_\_\_\_ for \*\* state sales and use taxes paid by the Contractor, the Contractor will indemnify and hold harmless and does hereby undertake and agree to indemnify and hold harmless the Owner, including the defense of any suit, from any claim, demand or lien arising out of the acts of the Contractor in the performance of the Contract for which the Contractor is liable and which may have been or may be filed against the Owner.

---

Signature

- \* President, Vice-President, Partner or Owner, or, if undersigned is other than one of foregoing, Power of Attorney signed by one of the foregoing in favor of the undersigned should be attached. Indicate applicable designation.
- \*\* In addition, Contractor shall submit a detailed statement of sales and use taxes paid in accordance with requirements of statute in state having jurisdiction.

# MEMORANDUM OF SUBSTANTIAL COMPLETION

Kingbrook Rural Water System

Exploratory Test Drilling and Construction of DeSmet Well No. 4

This memorandum between Kingbrook Rural Water System,  
(hereinafter called Owner), and \_\_\_\_\_  
of \_\_\_\_\_ (hereinafter called Contractor).

## WITNESSETH

Whereas, Section 1.22 of the Contract General Conditions defines Substantial Completion as follows: "The date as certified by the Engineer when the construction of the project or a specified part thereof is sufficiently completed in accordance with the contract documents so that the project or specified part can be utilized for the purposes for which it is intended," and as modified by Other Supplemental Conditions, and

Whereas Section 29.1 of the Contract General Conditions specifies as follows: "The Contractors shall guarantee all materials and equipment furnished and WORK performed for a period of one year from the date of Substantial Completion,"

Now, therefore, it is herein recognized that the following sections of work or portions of the contracted work are herein recognized as being substantially completed on the date indicated and further recognized that the one-year guarantee period shall commence at the date indicated. The recognized portions are listed as follows:

Item

Date -

Recommended by: DeWilde Grant Reckert & Associates Co. (Date) \_\_\_\_\_

Approved by: Kingbrook Rural Water System (Date) \_\_\_\_\_

Acknowledged by: Contractor (Date) \_\_\_\_\_

FINAL INSPECTION AND ACCEPTANCE

Contractor \_\_\_\_\_

Address \_\_\_\_\_

Project \_\_\_\_\_

Final change orders have been submitted and a final inspection of the facility as constructed has been made. The project construction is accepted with the following exceptions:

The project Engineer certifies that the construction has been inspected and tested and, to the best of his knowledge, information and belief is in substantial compliance with the drawings and specifications and contract change orders.

This acceptance is subject to approval of all State and Federal agencies having jurisdiction.

The undersigned Owner accepts the work constructed under the conditions and guarantee of the contract with the exceptions as noted above.

The \_\_\_\_\_ year maintenance requirement of the contract, secured by the Performance and Payment Bond, shall become effective as of \_\_\_\_\_, 19\_\_\_\_.

DeWild Grant Reckert & Assoc.

Project Engineer

Owner

By \_\_\_\_\_ By \_\_\_\_\_

Date \_\_\_\_\_ Date \_\_\_\_\_

FARMERS HOME ADMINISTRATION

Contractor \_\_\_\_\_ By \_\_\_\_\_  
State Director or his  
delegate

By \_\_\_\_\_ Date \_\_\_\_\_

Date \_\_\_\_\_

## CONTRACTOR'S RECEIPT FOR FINAL PAYMENT

Name of Project \_\_\_\_\_ Date \_\_\_\_\_

| Previous Contract Payments | Final Contract Payment | Total Contract Payments |
|----------------------------|------------------------|-------------------------|
| \$ _____                   | \$ _____               | \$ _____                |

The undersigned acknowledges receipt of the final contract payment shown above as satisfaction in full of all claims of the undersigned under the Construction Contract between the undersigned and \_\_\_\_\_

Name of Owner

\_\_\_\_\_ dated \_\_\_\_\_  
as amended, and as complete performance by the Owner of all obligations to be performed by him pursuant thereto. The total amount received under this contract is shown above.

Name of Contractor \_\_\_\_\_

By \_\_\_\_\_

CONTRACT CONDITIONS

GENERAL CONDITIONS

## GENERAL CONDITIONS

- |                                                |                                                |
|------------------------------------------------|------------------------------------------------|
| 1. Definitions                                 | 17. Subsurface Conditions                      |
| 2. Additional Instructions and Detail Drawings | 18. Suspension of Work, Termination, and Delay |
| 3. Schedules, Reports, and Records             | 19. Payments to Contractor                     |
| 4. Drawings and Specifications                 | 20. Acceptance of Final Payment as Release     |
| 5. Shop Drawings                               | 21. Insurance                                  |
| 6. Materials, Services, and Facilities         | 22. Contract Security                          |
| 7. Inspection and Testing                      | 23. Assignments                                |
| 8. Substitutions                               | 24. Indemnification                            |
| 9. Patents                                     | 25. Separate Contracts                         |
| 10. Surveys, Permits, Regulations              | 26. Subcontracting                             |
| 11. Protection of Work, Property, Persons      | 27. Engineer's Authority                       |
| 12. Supervision by Contractor                  | 28. Land and Rights-of-Way                     |
| 13. Changes in the Work                        | 29. Guaranty                                   |
| 14. Changes in Contract Price                  | 30. Arbitration                                |
| 15. Time for Completion and Liquidated Damages | 31. Taxes                                      |
| 16. Correction of Work                         |                                                |

### 1. DEFINITIONS

1.1 Wherever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicated and shall be applicable to both the singular and plural thereof:

1.2 ADDENDA - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS and SPECIFICATIONS, by additions, deletions, clarifications, or corrections.

1.3 BID - The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.

1.4 BIDDER - Any person, firm, or corporation submitting a BID for the WORK.

1.5 BONDS - Bid, Performance, and Payment Bonds and other instruments of surety, furnished by the CONTRACTOR and the CONTRACTOR'S surety in accordance with the CONTRACT DOCUMENTS.

1.6 CHANGE ORDER - A written order to the CONTRACTOR authorizing an addition, deletion, or revision in the WORK within the general scope of the CONTRACT DOCUMENTS, or authorizing an adjustment in the CONTRACT PRICE or CONTRACT TIME.

1.7 CONTRACT DOCUMENTS - The contract, including Advertisement For BIDS, Information For BIDDERS, BID, BID BOND, Agreement, Payment BOND, Performance BOND, NOTICE OF AWARD, NOTICE TO PROCEED, CHANGE ORDER, DRAWINGS, SPECIFICATIONS, and ADDENDA.

1.8 CONTRACT PRICE - The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.

1.9 CONTRACT TIME - The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.

1.10 CONTRACTOR - The person, firm, or corporation with whom the OWNER has executed the Agreement.

1.11 DRAWINGS - The parts of the CONTRACT DOCUMENTS which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.

1.12 ENGINEER - The person, firm, or corporation named as such in the CONTRACT DOCUMENTS.

1.13 FIELD ORDER - A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the ENGINEER to the CONTRACTOR during construction.

1.14 NOTICE OF AWARD - The written notice of the acceptance of the BID from the OWNER to the successful BIDDER.

1.15 NOTICE TO PROCEED - Written communication issued by the OWNER to the CONTRACTOR authorizing him/her to proceed with the WORK and establishing the date for commencement of the WORK.

1.16 OWNER - A public or quasi-public body or authority, corporation, association, partnership, or an individual for whom the WORK is to be performed.

1.17 PROJECT - The undertaking to be performed as provided in the CONTRACT DOCUMENTS.

1.18 RESIDENT PROJECT REPRESENTATIVE - The authorized representative of the OWNER who is assigned to the PROJECT site or any part thereof.

1.19 SHOP DRAWINGS - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, SUPPLIER or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.

1.20 SPECIFICATIONS - A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

1.21 SUBCONTRACTOR - An individual, firm, or corporation having a direct contract with CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.

1.22 SUBSTANTIAL COMPLETION - That date certified by the ENGINEER when the construction of the PROJECT or a specified part thereof is sufficiently completed, in accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended.

1.23 SUPPLEMENTAL GENERAL CONDITIONS - Modifications to General Conditions required by a Federal agency for participation in the PROJECT and approved by the agency in writing prior to inclusion in the CONTRACT DOCUMENTS, or such requirements that may be imposed by applicable state laws.

1.24 SUPPLIER - Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site.

1.25 WORK - All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated or to be incorporated in the PROJECT.

1.26 WRITTEN NOTICE - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at their last given address, or delivered in person to said party or their authorized representative on the WORK.

## 2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

2.1 The CONTRACTOR may be furnished additional instructions and detail drawings, by the ENGINEER, as necessary to carry out the WORK required by the CONTRACT DOCUMENTS.

2.2 The additional drawings and instructions thus supplied will become a part of the CONTRACT DOCUMENTS. The CONTRACTOR shall carry out the WORK in accordance with the additional detail drawings and instructions.

## 3. SCHEDULES, REPORTS AND RECORDS

3.1 The CONTRACTOR shall submit to the OWNER such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the CONTRACT DOCUMENTS for the WORK to be performed.

3.2 Prior to the first partial payment estimate the CONTRACTOR shall submit construction progress schedules showing the order in which the CONTRACTOR proposes to carry on the WORK, including dates at which the various parts of the WORK will be started, estimated date of completion of each part and, as applicable:

3.2.1 The dates at which special detail drawings will be required; and

3.2.2 Respective dates for submission of SHOP DRAWINGS, the beginning of manufacture, the testing and the installation of materials, supplies and equipment.

3.3 The CONTRACTOR shall also submit a schedule of payments that the CONTRACTOR anticipates will be earned during the course of the WORK.

#### 4. DRAWINGS AND SPECIFICATIONS

4.1 The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and all incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy or operation by the OWNER.

4.2 In case of conflict between the DRAWINGS and SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over general DRAWINGS.

4.3 Any discrepancies found between the DRAWINGS and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after discovery of such discrepancies, inconsistencies or ambiguities shall be done at the CONTRACTOR'S risk.

#### 5. SHOP DRAWINGS

5.1 The CONTRACTOR shall provide SHOP DRAWINGS as may be necessary for the prosecution of the WORK as required by the CONTRACT DOCUMENTS. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S approval of any SHOP DRAWING shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS. The approval of any SHOP DRAWING which substantially deviates from the requirement of the CONTRACT DOCUMENTS shall be evidenced by a CHANGE ORDER.

5.2 When submitted for the ENGINEER'S review, SHOP DRAWINGS shall bear the CONTRACTOR'S certification that he has reviewed, checked and approved the SHOP DRAWINGS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.

5.3 Portions of the WORK requiring a SHOP DRAWING or sample submission shall not begin until the SHOP DRAWING or submission has been approved by the ENGINEER. A copy of each approved SHOP DRAWING and each approved sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the ENGINEER.

## 6. MATERIALS, SERVICES AND FACILITIES

6.1 It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified time.

6.2 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.

6.3 Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

6.4 Materials, supplies, and equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the ENGINEER.

6.5 Materials, supplies, or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

## 7. INSPECTION AND TESTING

7.1 All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the CONTRACT DOCUMENTS.

7.2 The OWNER shall provide all inspection and testing services not required by the CONTRACT DOCUMENTS.

7.3 The CONTRACTOR shall provide at the CONTRACTOR'S expense the testing and inspection services required by the CONTRACT DOCUMENTS.

7.4 If the CONTRACT DOCUMENTS, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any WORK to specifically be inspected, tested, or approved by someone other than the CONTRACTOR, the CONTRACTOR will give the ENGINEER timely notice of readiness. The CONTRACTOR will then furnish the ENGINEER the required certificates of inspection, testing or approval.

7.5 Inspections, tests, or approvals by the engineer or others shall not relieve the CONTRACTOR from the obligations to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS.

7.6 The ENGINEER and the ENGINEER'S representatives will at all times have access to the WORK. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all work, materials, payrolls, records or personnel, invoices of materials, and other relevant data and records. The CONTRACTOR will provide proper facilities for such access and observation of the WORK and also for any inspection or testing thereof.

7.7 If any WORK is covered contrary to the written instructions of the ENGINEER it must, if requested by the ENGINEER, be uncovered for the ENGINEER'S observation and replaced at the CONTRACTOR'S expense.

7.8 If the ENGINEER considers it necessary or advisable that covered WORK be inspected or tested by others, the CONTRACTOR, at the ENGINEER'S request, will uncover, expose or otherwise make available for observation, inspection or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such WORK is defective, the CONTRACTOR will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, if, however, such WORK is not found to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate CHANGE ORDER shall be issued.

## 8. SUBSTITUTIONS

8.1 Whenever a material, article, or piece of equipment is identified on the DRAWINGS or SPECIFICATIONS by reference to brand name or catalogue numbers, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered. The CONTRACTOR may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the CONTRACT DOCUMENTS

by reference to brand name or catalogue number, and if, in the opinion of the ENGINEER, such material, article, or piece of equipment is of equal substance and function to that specified, the ENGINEER may approve its substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS shall be appropriately modified by CHANGE ORDER. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra component parts required to accomodate the substitute will be made by the CONTRACTOR without a change in the CONTRACT PRICE or CONTRACT TIME.

#### 9. PATENTS

9.1 The CONTRACTOR shall pay all applicable royalties and license fees, and shall defend all suits or claims for infringement of any patent rights and save the OWNER harmless from loss on account thereof, except that the OWNER shall be responsible for any such loss when a particular process, design, or product of a particular manufacturer or manufacturers is specified, however, if the CONTRACTOR has reason to believe that the design, process or product specified is an infringement of a patent, the CONTRACTOR shall be responsible for such loss unless the CONTRACTOR promptly gives such information to the ENGINEER.

#### 10. SURVEYS, PERMITS, REGULATIONS

10.1 The OWNER shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the WORK together with a suitable number of bench marks adjacent to the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the OWNER, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pipe locations and other working points, lines, elevations and cut sheets.

10.2 The CONTRACTOR shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, shall be charged with the resulting expense and shall be responsible for any mistake that may be caused by their unnecessary loss or disturbance.

10.3 Permits and licenses of a temporary nature necessary for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise stated in the SUPPLEMENTAL GENERAL CONDITIONS. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the OWNER, unless otherwise specified. The

CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the WORK as drawn and specified. If the CONTRACTOR observes that the CONTRACT DOCUMENTS are at variance therewith, the CONTRACTOR shall promptly notify the ENGINEER in writing, and any necessary changes shall be adjusted as provided in Section 13, CHANGES IN THE WORK.

## 11. PROTECTION OF WORK, PROPERTY, AND PERSONS

11.1 The CONTRACTOR will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. The CONTRACTOR will take all necessary precautions for the safety of, will provide the necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the WORK and other persons who may be affected thereby, all the WORK and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

11.2 The CONTRACTOR will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. The CONTRACTOR will erect and maintain, as required by the conditions and progress of the WORK, all necessary safeguards for safety and protection. The CONTRACTOR will notify owners of adjacent utilities when prosecution of the WORK may affect them. The CONTRACTOR will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or part, by the CONTRACTOR, any SUBCONTRACTOR or anyone directly or indirectly employed by any of them or anyone directly or indirectly employed by any of them or anyone of whose acts any of them be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or to the acts or omissions of the OWNER, of the ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.

11.3 In emergencies affecting the safety of persons or the WORK or property at the site or adjacent thereto, the CONTRACTOR, without special instructions or authorization from the ENGINEER or OWNER, shall act to prevent threatened damage, injury or loss. The CONTRACTOR will give the ENGINEER prompt WRITTEN NOTICE of any significant changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall thereupon be issued covering the changes and deviations involved.

## 12. SUPERVISION BY CONTRACTOR

12.1 The CONTRACTOR will supervise and direct the WORK. He will be solely responsible for the means, methods, techniques, sequences and procedures of

construction. The CONTRACTOR will employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by the CONTRACTOR as the CONTRACTOR'S representative at the site. The supervisor shall have full authority to act on behalf of the CONTRACTOR and all communications given to the supervisor shall be as binding as if given to the CONTRACTOR. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the WORK.

### 13. CHANGES IN THE WORK

13.1 The OWNER may at any time, as the need arises, order changes within the scope of the WORK without invalidating the Agreement. If such changes increase or decrease the amount due under the CONTRACT DOCUMENTS, or in the time required for performance of the WORK, an equitable adjustment shall be authorized by CHANGE ORDER.

13.2 The ENGINEER, also, may at any time, by issuing a FIELD ORDER, make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the ENGINEER unless the CONTRACTOR believes that such FIELD ORDER entitles the CONTRACTOR to a change in CONTRACT PRICE or TIME, or both, in which event the CONTRACTOR shall give the ENGINEER WRITTEN NOTICE thereof within seven (7) days after the receipt of the ordered change. Thereafter the CONTRACTOR shall document the basis for the change in CONTRACT PRICE or TIME within thirty (30) days. The CONTRACTOR shall not execute such changes pending the receipt of an executed CHANGE ORDER or further instruction from the OWNER.

### 14. CHANGES IN CONTRACT PRICE

14.1 The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of precedence listed below:

- a. Unit prices previously approved.
- b. An agreed lump sum.

### 15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

15.1 The date of beginning and the time for completion of the WORK are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced

on a date specified in the NOTICE TO PROCEED.

15.2 The CONTRACTOR will proceed with the WORK at such rate of progress to insure full completion within the CONTRACT TIME. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the CONTRACT TIME for the completion of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.

15.3 If the CONTRACTOR shall fail to complete the WORK within the CONTRACT TIME, or extension of time granted by the OWNER, then the CONTRACTOR will pay to the OWNER the amount for liquidated damages as specified in the BID for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT DOCUMENTS.

15.4 The CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the WORK is due to the following and the CONTRACTOR has promptly given WRITTEN NOTICE of such delay to the OWNER or ENGINEER.

15.4.1 To any preference, priority or allocation order duly issued by the OWNER.

15.4.2 To unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God, or of the public enemy, acts of the OWNER, acts of another CONTRACTOR in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and

15.4.3 To any delays of SUBCONTRACTORS occasioned by any of the causes specified in paragraphs 15.4.1 and 15.4.2 of this article.

## 16. CORRECTION OF WORK

16.1 The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and reexecute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the OWNER and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.

16.2 All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the OWNER may remove such

WORK and store the materials at the expense of the CONTRACTOR.

#### 17. SUBSURFACE CONDITIONS

17.1 The CONTRACTOR shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the OWNER by WRITTEN NOTICE of:

17.1.1 Subsurface or latent physical conditions at the site differing materially from those indicated in the CONTRACT DOCUMENTS; or

17.1.2 Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.

17.2 The OWNER shall promptly investigate the conditions, and if it is found that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK, an equitable adjustment shall be made and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER. Any claim of the CONTRACTOR for adjustment hereunder shall not be allowed unless the required WRITTEN NOTICE has been given; provided that the OWNER may, if the OWNER determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

#### 18. SUSPENSION OF WORK, TERMINATION, AND DELAY

18.1 The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety days or such further time as agreed upon by the CONTRACTOR, by WRITTEN NOTICE to the CONTRACTOR and the ENGINEER which shall fix the date on which WORK shall be resumed. The CONTRACTOR will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.

18.2 If the CONTRACTOR is adjudged a bankrupt or insolvent, or makes a general assignment for the benefit of its creditors, or if a trustee or receiver is appointed for the CONTRACTOR or for any of its property, or if CONTRACTOR files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials or equipment or disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the WORK or disregards the authority of the ENGINEER, or otherwise violates any provision of the CONTRACT DOCUMENTS, then the OWNER may, without prejudice to any other right or remedy and after giving the

CONTRACTOR and its surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take possession of the PROJECT and of all materials, equipment, tools, construction equipment and machinery thereon owned by the CONTRACTOR, and finish the WORK by whatever method the OWNER may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the OWNER. Such costs incurred by the OWNER will be determined by the ENGINEER and incorporated in a CHANGE ORDER.

18.3 Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.

18.4 After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR and the ENGINEER, the OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the CONTRACT. In such case the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit.

18.5 If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to act on any request for payment within thirty (30) days after it is submitted, or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER or awarded by arbitrators within thirty (30) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER and the ENGINEER terminate the CONTRACT and recover from the OWNER payment for all WORK executed and all expenses sustained. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days written notice to the OWNER and the ENGINEER stop the WORK until paid all amounts then due, in which event and upon resumption of the WORK CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK.

18.6 If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE or

an extension of the CONTRACT TIME, or both, shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.

19. PAYMENT TO CONTRACTOR

19.1 At least ten (10) days before each progress payment falls due (but not more often than once a month), the CONTRACTOR will submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER'S title to the material and equipment and protect the OWNER'S interest therein, including applicable insurance. The ENGINEER will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing approval of payment, and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTOR indicating in writing the reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The OWNER will, within ten (10) days of presentation of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the approved partial payment estimate less the retainage. The retainage shall be an amount equal to 10% of said estimate until 50% of the work has been completed. At 50% completion, further partial payments shall be made in full to the CONTRACTOR and no additional amounts may be retained unless the ENGINEER certifies that the job is not proceeding satisfactorily, but amounts previously retained shall not be paid to the CONTRACTOR. At 50% completion or any time thereafter when the progress of the WORK is not satisfactory, additional amounts may be retained but in no event shall the total retainage be more than 10% of the value of the work completed. Upon substantial completion of the work, any amount retained may be paid to the CONTRACTOR. When the WORK has been substantially completed except for WORK which cannot be completed because of weather conditions, lack of materials or other reasons which in the judgement of the OWNER are valid reasons for noncompletion, the OWNER may make additional payments, retaining at all times an amount sufficient to cover the estimated cost of the WORK still to be completed.

19.2 The request for payment may also include an allowance for the cost of such major materials and equipment which are suitably stored either at or near the site.

19.3 Prior to SUBSTANTIAL COMPLETION, the OWNER, with the approval of the ENGINEER and with the concurrence of the CONTRACTOR, may use any completed or substantially completed portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.

19.4 The OWNER shall have the right to enter the premises for the purpose of doing work not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.

19.5 Upon completion and acceptance of the WORK, the ENGINEER shall issue a certificate attached to the final payment request that the WORK has been accepted under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK.

19.6 The CONTRACTOR will indemnify and save the OWNER or the OWNER'S agents harmless from all claims growing out of the lawful demand of SUBCONTRACTORS, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the WORK. The CONTRACTOR shall, at the OWNER'S request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the CONTRACTOR fails to do so the OWNER may, after having notified the CONTRACTOR, either pay unpaid bills or withhold from the CONTRACTOR'S unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the CONTRACTOR shall be resumed in accordance with the terms of the CONTRACT DOCUMENTS, but in no event shall the provisions of this sentence be construed to impose any obligations upon the OWNER to either the CONTRACTOR, the CONTRACTOR'S Surety, or any third party. In paying any unpaid bills of the CONTRACTOR, any payment so made by the OWNER shall be considered as a payment made under the CONTRACT DOCUMENTS by the OWNER to the CONTRACTOR and the OWNER shall not be liable to the CONTRACTOR for any such payments made in good faith.

19.7 If the OWNER fails to make payment thirty (30) days after approval by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the CONTRACTOR.

## 20. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

20.1 The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with

this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK. Any payment, however, final or otherwise, shall not release the CONTRACTOR or its sureties from any obligations under the CONTRACT DOCUMENTS or the Performance and Payment BONDS.

## 21. INSURANCE

21.1 The CONTRACTOR shall purchase and maintain such insurance as will protect it from claims set forth below which may arise out of, or result from, the CONTRACTOR'S execution of the WORK, whether such execution be by the CONTRACTOR, any SUBCONTRACTOR, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

21.1.1 Claims under workmen's compensation, disability benefit and other similar employee benefit acts;

21.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of employees;

21.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than employees;

21.1.4 Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person; and

21.1.5 Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

21.2 Certificates of Insurance acceptable to the OWNER shall be filed with the OWNER prior to commencement of the WORK. These Certificates shall contain a provision that coverages afforded under the policies will not be cancelled unless at least fifteen (15) days prior WRITTEN NOTICE has been given to the OWNER.

21.3 The CONTRACTOR shall procure and maintain, at the CONTRACTOR'S own expense, during the CONTRACT TIME, Liability insurance as hereinafter specified:

21.3.1 CONTRACTOR'S General Public Liability and Property Damage Insurance including vehicle coverage issued to the CONTRACTOR and protecting the CONTRACTOR from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the CONTRACT DOCUMENTS, whether such operations be by the CONTRACTOR or by any SUBCONTRACTOR employed by the CONTRACTOR or anyone directly

or indirectly employed by the CONTRACTOR or by a SUBCONTRACTOR employed by the CONTRACTOR. Insurance shall be written with a limit of liability of not less than \$500,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than \$500,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than \$200,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than \$200,000 aggregate for any such damage sustained by two or more persons in any one accident.

21.3.2 The CONTRACTOR shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the PROJECT to the full insurable value thereof for the benefit of the OWNER, the CONTRACTOR, and SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.

21.4 The CONTRACTOR shall procure and maintain, at the CONTRACTOR'S own expense, during the CONTRACT TIME, in accordance with the provisions of the laws of the state in which the WORK is performed, Workmen's Compensation Insurance, including occupational disease provisions, for all of the CONTRACTOR'S employees at the site of the PROJECT and in case any WORK is sublet, the CONTRACTOR shall require such SUBCONTRACTOR similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous work under this contract at the site of the PROJECT is not protected under Workmen's Compensation statute, the CONTRACTOR shall provide, and shall cause each SUBCONTRACTOR to provide, adequate and suitable insurance for the protection of its employees not otherwise protected.

21.5 The CONTRACTOR shall secure, if applicable, "All Risk" type Builder's Risk Insurance for WORK to be performed. Unless specifically authorized by the OWNER, the amount of such insurance shall not be less than the CONTRACT PRICE totaled in the BID. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft, and smoke during the CONTRACT TIME, and until the WORK is accepted by the OWNER. The policy shall name as the insured the CONTRACTOR, and the OWNER.

## 22. CONTRACT SECURITY

22.1 The CONTRACTOR shall within ten (10) days after the receipt of the NOTICE OF AWARD furnish the OWNER with a Performance BOND and a Payment BOND in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance

by the CONTRACTOR of all undertakings, covenants, terms, conditions and agreements of the CONTRACT DOCUMENTS, and upon the prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the CONTRACT DOCUMENTS. Such BONDS shall be executed by the CONTRACTOR and a corporate bonding company licensed to transact such business in the state in which the WORK is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these BONDS shall be borne by the CONTRACTOR. If at any time a surety on any such BOND is declared a bankrupt or loses its right to do business in the state in which the WORK is to be performed or is removed from the list of Surety Companies accepted on Federal Bonds, CONTRACTOR shall within ten (10) days after notice from the OWNER to do so, substitute an acceptable BOND (or BONDS) in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such BOND shall be paid by the CONTRACTOR. No further payment shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable BOND to the OWNER.

### 23. ASSIGNMENTS

23.1 Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign, or otherwise dispose of the Contract or any portion thereof, or of any right, title or interest therein, or any obligations thereunder, without written consent of the other party.

### 24. INDEMNIFICATION

24.1 The CONTRACTOR will indemnify and hold harmless the OWNER and the ENGINEER and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the WORK, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

24.2 In any and all claims against the OWNER or the ENGINEER, or any of their agents or employees, by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.

24.3 The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, its agents or employees arising out of the preparation or approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, designs or SPECIFICATIONS.

## 25. SEPARATE CONTRACTS

25.1 The OWNER reserves the right to let other contracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the introduction and storage of their materials and the execution of their WORK, and shall properly connect and coordinate the WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other CONTRACTOR, the CONTRACTOR shall inspect and promptly report to the ENGINEER any defects in such WORK that render it unsuitable for such proper execution and results.

25.2 The OWNER may perform additional WORK related to the PROJECT or the OWNER may let other contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are parties to such Contracts (or the OWNER, if the OWNER is performing the additional WORK) reasonable opportunity for the introduction and storage of materials and equipment and the execution of WORK, and shall properly connect and coordinate the WORK with theirs.

25.3 If the performance of additional WORK by other CONTRACTORS or the OWNER is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, written notice thereof shall be given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or others involves it in additional expense or entitles it to an extension of the CONTRACT TIME, the CONTRACTOR may make a claim thereof as provided in Sections 14 and 15.

## 26. SUBCONTRACTING

26.1 The CONTRACTOR may utilize the services of specialty SUBCONTRACTS on those parts of the WORK which, under normal contracting practices, are performed by speciality SUBCONTRACTORS.

26.2 The CONTRACTOR shall not award WORK to SUBCONTRACTOR(s), in excess of fifty (50%) percent of the CONTRACT PRICE, without prior written approval of the OWNER.

26.3 The CONTRACTOR shall be fully responsible to the OWNER for the acts and omissions of its SUBCONTRACTORS, and of persons either directly or indirectly employed by them, as the CONTRACTOR is for the acts and omissions of persons directly employed by the CONTRACTOR.

26.4 The CONTRACTOR shall cause appropriate provisions to be inserted in all subcontracts relative to the WORK to bind SUBCONTRACTORS to the CONTRACTOR by the terms of the CONTRACT DOCUMENTS insofar as applicable to the WORK of SUBCONTRACTORS and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under any provision of the CONTRACT DOCUMENTS.

26.5 Nothing contained in this CONTRACT shall create any contractual relationship between any SUBCONTRACTOR and the OWNER. (Revised 2-16-83, PN 869.)

## 27. ENGINEER'S AUTHORITY

27.1 The ENGINEER shall act as the OWNER'S representative during the construction period, shall decide questions which may arise as to quality and acceptability of materials furnished and WORK performed, and shall interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The ENGINEER will make visits to the site and determine if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.

27.2 The CONTRACTOR will be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship, and execution of the WORK. Inspections may be made at the factory or fabrication plant of the source of material supply.

27.3 The ENGINEER will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

27.4 The ENGINEER shall promptly make decisions relative to interpretation of the CONTRACT DOCUMENTS.

## 28. LAND AND RIGHTS-OF-WAY

28.1 Prior to issuance of NOTICE TO PROCEED, the OWNER shall obtain all land and rights-of-way necessary for carrying out and for the completion of the WORK to be performed pursuant to the CONTRACT DOCUMENTS, unless otherwise mutually agreed.

28.2 The OWNER shall provide to the CONTRACTOR information which delineates and describes the lands owned and rights-of-way acquired.

28.3 The CONTRACTOR shall provide at its own expense and without liability to the OWNER any additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

## 29. GUARANTEE

29.1 The CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of SUBSTANTIAL COMPLETION. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of SUBSTANTIAL COMPLETION of the system that the completed system is free from all defects due to faulty materials or workmanship and the CONTRACTOR shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. The OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments, or other WORK that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. The Performance BOND shall remain in full force and effect through the guarantee period.

## 30. ARBITRATION BY MUTUAL AGREEMENT (Revised 2-16-83, PN 869.)

30.1 All claims, disputes, and other matters in question arising out of, or relating to, the CONTRACT DOCUMENTS or the breach thereof, except for claims which have been waived by making an acceptance of final payment as provided by Section 20, may be decided by arbitration if the parties mutually agree. Any agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.  
(Revised 2-16-83, PN 869.)

30.2 Notice of the request for arbitration shall be filed in writing with the other party to the CONTRACT DOCUMENTS and a copy shall be filed with the ENGINEER. Request for arbitration shall in no event be made on any claim, dispute, or other matter in question which would be barred by the applicable statute of limitations. (Revised 2-16-83, PN 869.)

30.3 The CONTRACTOR will carry on the WORK and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

## 31. TAXES

31.1 The CONTRACTOR will pay all sales, consumer, use, and other similar taxes required by the laws of the place where the WORK is performed.

FmHA SUPPLEMENTAL GENERAL CONDITIONS

FmHA Supplemental General Conditions

The provisions of the Farmers Home Administration (FmHA) Supplemental General Conditions as described herein change, amend, or supplement the General Conditions and shall supersede any conflicting provisions of this CONTRACT. All provisions of the General Conditions which are not changed, amended, or supplemented, remain in full force.

- |                                     |                                           |
|-------------------------------------|-------------------------------------------|
| 1. CONTRACT APPROVAL                | 9. SMALL, MINORITY AND WOMEN'S BUSINESSES |
| 2. CONTRACT CHANGE ORDERS           | 10. ANTI-KICKBACK                         |
| 3. PARTIAL PAYMENT ESTIMATES        | 11. VIOLATING FACILITIES                  |
| 4. CONFLICT OF INTEREST             | 12. STATE ENERGY POLICY                   |
| 5. PROTECTION OF LIVES AND PROPERTY | 13. EQUAL OPPORTUNITY REQUIREMENTS        |
| 6. REMEDIES                         | 14. CERTIFICATE OF OWNER'S ATTORNEY       |
| 7. GRATUITIES                       | 15. FmHA CONCURRENCE                      |
| 8. AUDIT AND ACCESS TO RECORDS      |                                           |

1. Contract Approval.

1.1 The OWNER and the CONTRACTOR will furnish the OWNER'S Attorney such evidence as required so that the OWNER'S Attorney can complete and execute "Certificate of Owner's Attorney" (Section 14) before the OWNER submits the executed Contract Documents to FmHA for approval.

1.2 Concurrence by the FmHA State Director or designee in the award of the CONTRACT is required before it is effective and the "FmHA Concurrence" (Section 15), shall be attached and made a part of the Agreement.

1.3 When a Performance BOND and Payment BOND are provided, the United States acting through the Farmers Home Administration will be named as co-obligee in these BONDS unless prohibited by State law. Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.

1.4 This CONTRACT is expected to be funded in part with funds from the FmHA. Neither the United States nor any of its departments, agencies, or employees is or will be a party to this CONTRACT of any SUBCONTRACT.

2. Contract Change Orders.

2.1 All changes affecting the project's construction cost or modifications of the terms or conditions of the contract must be authorized by means of a written contract change order which is mutually agreed to by the OWNER and CONTRACTOR and is approved by FmHA. The contract change order will include extra work, work for which quantities have been altered from those shown in the bidding schedule, as well as decreases or increases in the quantities of installed units-which are different than those shown in the bidding schedule because of final measurements. All changes must be recorded on a contract change order before they can be included in a partial payment estimate.

2.2 FORM FmHA 424-7, "Contract Change Order" or similar form approved by FmHA shall be used to record CONTRACT changes.

2.3 When the CONTRACT sum is in whole or in part based on unit prices, the OWNER reserves the right to increase or decrease a unit price quantity as may be deemed reasonable or necessary in order to complete the work contemplated by this CONTRACT.

### 3. Partial Payment Estimates.

3.1 FORM FmHA 424-18, "Partial Payment Estimate," or similar form approved by FmHA shall be used when estimating periodic payments due the CONTRACTOR.

3.2 The OWNER may after consultation with the ARCHITECT/ENGINEER withhold or, on account of subsequently discovered evidence, nullify the whole or part of any approved partial payment estimate to such extent as may be necessary to protect the OWNER from loss on account of:

3.2.1 Defective work not remedied.

3.2.2 Claims filed.

3.2.3 Failure of CONTRACTOR to make payments properly to subcontractors or suppliers.

3.2.4 A reasonable doubt that the WORK can be completed for the balance then unpaid.

3.2.5 Damage to another CONTRACTOR.

3.2.6 Performance of WORK in violation of the terms of the CONTRACT DOCUMENTS.

3.3 Where WORK on unit price items are substantially complete but lack testing, clean-up and/or corrections, amounts shall be deducted from unit prices in partial payment estimates to amply cover such testing, clean-up and/or corrections.

3.4 When the items in 3.2 and 3.3 are cured, payment shall be made for amounts withheld because of them.

3.5 Payments will not be made that would deplete the retainage nor place in escrow any funds that are required for retainage nor invest the retainage for the benefit of the CONTRACTOR.

#### 4. Conflict of Interest.

4.1. Unacceptable bidders. An ENGINEER or ARCHITECT (individual or firm including persons they employ) who has prepared plans and specifications will not be considered an acceptable bidder. Any firm or corporation in which such ENGINEER or ARCHITECT (including persons they employ) is an officer, employee, or holds or controls a substantial interest will not be considered an acceptable bidder. Contracts or purchases by the CONTRACTOR shall not be awarded or made to a supplier or manufacturer if the ENGINEER or ARCHITECT (firm or individual) who prepared the plans and specifications has a corporate or financial affiliation with the supplier or manufacturer. Bids will not be awarded to firms or corporations which are owned or controlled wholly or in part by a member of the governing body of the OWNER or to an individual who is such a member.

4.2. The OWNER'S officers, employees, or agents shall not engage in the award of administration of this CONTRACT if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when: (a) the employee, officer or agent; (b) any member of their immediate family; (c) their partner or (d) an organization which employs, or is about to employ, any of the above has financial or interest in the CONTRACTOR. The OWNER'S officers, employees, or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from the CONTRACTOR or subcontractor.

#### 5. Protection of Lives and Property

5.1 In order to protect the lives and health of its employees under the CONTRACT, the CONTRACTOR shall comply with all pertinent provisions of the Occupational Safety and Health Administration (OSHA) and any State Safety and Health agency requirements.

5.2 The CONTRACTOR alone shall be responsible for the safety, efficiency, and adequacy of its plant, appliances, and methods, and for any damage which may result from their failure or their improper construction, maintenance or operation.

#### 6. Remedies. Unless otherwise provided in this CONTRACT, all claims, counter-claims, disputes, and other matters in question between the OWNER and

the CONTRACTOR arising out of or relating to this CONTRACT or the breach thereof will be decided by arbitration if the parties mutually agree, or in a court of competent jurisdiction within the State in which the OWNER is located.

6.1 The arbitration provisions of this section may be initiated by either party to this CONTRACT by filing with the other party and the ENGINEER/ARCHITECT a WRITTEN REQUEST for arbitration.

6.2 Each party to this CONTRACT will appoint one arbitrator; the two arbitrators will select a third arbitrator.

6.3 The arbitrators will select a hearing location as close to the OWNER'S locale as possible.

6.4 The procedure for conducting the hearings will follow the Construction Industry Arbitration Rules of the American Arbitration Association.

#### 7. Gratuities.

7.1 If the OWNER finds after a notice and hearing that the CONTRACTOR, or any of the CONTRACTOR'S agents or representatives, offered or gave gratuities (in the form of entertainment, gifts, or otherwise), to any official, employee, or agent of the OWNER, the State, or FmHA officials in an attempt to secure this CONTRACT or favorable treatment in awarding, amending, or making any determinations related to the performance of this CONTRACT, the OWNER may, by written notice to the CONTRACTOR, terminate this CONTRACT. The OWNER may also pursue other rights and remedies that the law or this CONTRACT provides. However, the existence of the facts on which the OWNER bases such findings shall be an issue and may be reviewed in proceedings under the Remedies clause of this CONTRACT.

7.2 In the event this CONTRACT is terminated as provided in paragraph 7.1 the OWNER may pursue the same remedies against the CONTRACTOR as it could pursue in the event of a breach of the CONTRACT by the CONTRACTOR. As a penalty, in addition to any other damages to which it may be entitled by law, the OWNER may pursue exemplary damages in an amount (as determined by the OWNER) which shall be not less than three nor more than ten times the costs the CONTRACTOR incurs in providing any such gratuities to any such officer or employee.

8. Audit and Access to Records. For all negotiated contracts (except those of \$10,000 or less), the FmHA, the Comptroller General, the OWNER or any of their duly authorized representatives, shall have access to any books, documents, papers, and records of the CONTRACTOR, which are pertinent to the CONTRACT, for the purpose of making audits, examinations, excerpts and transcriptions. The CONTRACTOR shall maintain all required records for three years after final payment is made and all other pending matters are closed.
9. Small, Minority and Women's Businesses. If the CONTRACTOR intends to let any subcontracts for a portion of the work, the CONTRACTOR shall take affirmative steps to assure that small, minority and women's businesses are used when possible as sources of supplies, equipment, construction, and services. Affirmative steps shall consist of: (1) including qualified small minority, and women's businesses on solicitation lists; (2) assuring that small, minority and women's businesses are solicited whenever they are potential sources; (3) dividing total requirements, when economically feasible, into small tasks or quantities to permit maximum participation of small, minority, and women's businesses; (4) establishing delivery schedules, where the requirements of the work permit, which will encourage participation by small, minority and women's businesses; (5) using the services and assistance of the Small Business Administration, and the Minority Business Development Agency of the U.S. Department of Commerce; (6) requiring each party to a subcontract to take the affirmative steps of this section; and (7) CONTRACTORS are encouraged to procure goods and services from labor surplus area firms.
10. Anti-Kickback. The CONTRACTOR shall comply with the Copeland Anti-Kickback Act (18 USC 874) as supplemented in Department of Labor regulations (29 CFR, Part 3). This act provides that each CONTRACTOR shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public facilities, to give up any part of the compensation to which they are otherwise entitled. The OWNER shall report all suspected or reported violations to FmHA.
11. Violating Facilities. Where this CONTRACT exceeds \$100,000 the CONTRACTOR shall comply with all applicable standards, orders, or requirements issued under section 306 of the Clean Air Act (42 U.S.C. 1857(h)), section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and Environmental Protection Agency regulations 40 CFR Part 15 which prohibit the awarding of non-exempt federal contracts, grants, or loans to facilities included on EPA's list of violating facilities. The CONTRACTOR will report violations to the EPA.

12. State Energy Policy. The CONTRACTOR shall comply with the Energy Policy and Conservation Act (P.L. 94-163). Mandatory standards and policies relating to energy efficiency, contained in the State Energy Conservation Plan, shall be utilized.

13. Equal Opportunity Requirements. For all contracts in excess of \$10,000, the CONTRACTOR shall comply with Executive Order 11246, entitled "Equal Employment Opportunity," as amended by Executive Order 11375, and as supplemented in Department of Labor regulations (41 CFR Part 60).

13.1 If the CONTRACT exceeds \$10,000, the CONTRACTOR will execute Form FmHA 400-6, "Compliance Statement."

13.2 The CONTRACTOR'S compliance with Executive Order 11246 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the Standard Federal Equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 60-4 and its efforts to meet the goals established for the geographical area where the CONTRACT is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the CONTRACT, and in each trade, and the CONTRACTOR shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer or minority or female employees or trainees from contractor to contractor or from project to project for the sole purpose of meeting the CONTRACTOR'S goals shall be a violation of the CONTRACT, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

13.3 The CONTRACTOR shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the CONTRACT resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the CONTRACT is to be performed.

14. Certificate of Owner's Attorney.

I, the undersigned, \_\_\_\_\_, the duly authorized  
and acting legal representative of \_\_\_\_\_  
\_\_\_\_\_, do hereby certify as follows:

I have examined the attached contract(s) and performance and payment  
bond(s) and the manner of execution thereof, and I am of the opinion that  
each of the aforesaid agreements are adequate and have has been duly executed  
by the proper parties thereto acting through their duly authorized representa-  
tives; that said representatives have full power and authority to execute  
said agreements on behalf of the respective parties named thereon; and that  
the foregoing agreements constitute valid and legally binding obligations upon  
the parties executing the same in accordance with terms, conditions, and  
provisions thereof.

Date: \_\_\_\_\_

NOTE: Delete phrase "performance and payment bonds" when not applicable.

15. FmHA Concurrence.

As lender or insurer of funds to defray the costs of this contract, and without liability for any payments thereunder, the Farmers Home Administration (FmHA) hereby concurs in the award of this CONTRACT to

---

U.S. Department of Agriculture  
Farmers Home Administration

By \_\_\_\_\_

Title \_\_\_\_\_

Date \_\_\_\_\_

This CONTRACT shall not be effective unless and until concurred in by the State Director of the Farmers Home Administration, U.S. Department of Agriculture or a delegated representative.

FmHA SOUTH DAKOTA ATTACHMENT 1

I. FmHA PROJECT SIGN REQUIREMENT - Furnished & installed by the General Contractor

GREEN LETTERING ON  
WHITE BACKGROUND

PROJECT TITLE

SPONSOR/DEVELOPER

OFFICIAL(S) OR SPONSOR ADDRESS

ARCHITECT, ENGINEER

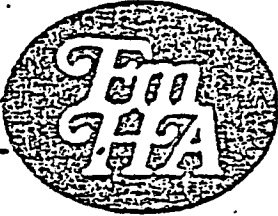
CONTRACTOR

FINANCED BY

FARMERS HOME ADMINISTRATION  
UNITED STATES DEPARTMENT OF AGRICULTURE

FEDERAL LAW PROHIBITS DISCRIMINATION BECAUSE OF  
RACE, COLOR, NATIONAL ORIGIN, AGE, AND HANDICAP

GREEN  
WHITE  
LETTERING



SIGN DIMENSIONS: 4' x 8' x 3/4" EXTERIOR PLYWOOD (A-B GRADE)

PROJECT SIGN FOR FmHA  
COMMUNITY PROGRAMS PROJECTS

II. CONSTRUCTION CONTRACTORS AFFIRMATIVE ACTION REQUIREMENTS

The items described below (the Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity required by Executive Order 11246, the Equal Opportunity Clause published at 41 CFR 60-1.4 (a) and (b), and the Standard Federal Equal Employment Opportunity Construction Contract Specifications required by Executive Order 11246) apply, during the performance of this contract, if the contract exceeds \$10,000 (This also includes subsequent loans and grants, or contract change orders made during the construction period of the original contract, which will cause the total to exceed \$10,000,) to the following: (1) All contractors or subcontractors who hold any Federal or federally assisted construction contract, (2) All grants, contracts and loans (direct, insured, or guaranteed) let by the FmHA, and (3) All construction work performed by construction contractors and subcontractors for Federal nonconstruction contractors and subcontractors if the construction work is necessary in whole or in part to the performance of a nonconstruction contract or subcontract. The items are applicable to all of a contractor's or subcontractor's employees who are engaged in "on site" construction including those construction employees who work on a non-Federal or non-federally assisted construction site. The items, however, will not pre-empt state and local government regulations of the construction industry, and will not relieve contractors and subcontractors of the obligations they may have under other affirmative action or equal opportunity programs.

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (Executive Order 11246)

Date \_\_\_\_\_ City \_\_\_\_\_ DOL Region \_\_\_\_\_

Goals and Timetables for WOMEN (Exhibit D, FmHA Instruction 1901-E)

| Timetable                 | Trade      | Goal (%) |
|---------------------------|------------|----------|
| From 4-1-78 until 3-31-79 | All trades | 3.1      |
| From 4-1-79 until 3-31-80 | All trades | 5.1      |
| From 4-1-80 until 3-31-81 | All trades | 6.9      |

Goals and Timetables for ALL MINORITIES (Exhibit D, FmHA Instruction 1901-E)

[illegible]

EQUAL OPPORTUNITY CLAUSE (41 CFR 60-1.4 (a) and (b))

- (1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited, to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Farmers Home Administration setting forth the provisions of this nondiscrimination clause.
- (2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.
- (3) The contractor will send to each labor union or representative of workers with which contractor has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Farmers Home Administration, advising the said labor union or workers' representative of the contractor's commitments under this agreement as required pursuant to Section 301 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (4) The contractor will comply with all provisions of such Executive Order and of all relevant rules, regulations, and orders of the Secretary of Labor and of any prior authority which remain in effect.
- (5) The contractor will furnish all information and reports required by such Executive Order, rules, regulations, and orders, or pursuant thereto, and will permit access to books, records, and accounts by the Farmers Home Administration and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be cancelled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further contracts in accordance with procedures authorized in such Executive Order and such other sanctions may be imposed and remedies invoked as provided in the Executive Order or by any such rules, regulations, or order, or as otherwise provided by law.
- (7) The contractor will include the provisions of paragraphs (1) through (7) in every subcontract or purchase order, unless exempted by such rules, regulations, or orders, so that such provisions will be binding upon each such subcontractor or vendor. The contractor will take such action as the Farmers Home Administration may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Farmers Home Administration, the contractor may request the United States to enter into such litigation to protect the interest of the United States.

1. As used in these specifications:  
a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;

b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;

c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

d. "Minority" includes:  
(i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);

(ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);

(iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and

(iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 80-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

d. Provide immediate written notification to the Director, when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice

of these programs to the sources compiled under 7b above.

f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 80-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate

single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at

least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

OTHER SUPPLEMENTAL CONDITIONS

## OTHER SUPPLEMENTAL CONDITIONS

The following supplements modify, change, delete, or add to the General Conditions, FmHA Supplemental General Conditions and CDBG Supplemental General Conditions. Where any part of the General Conditions, FmHA Supplemental General Conditions or CDBG Supplemental General Conditions is modified or voided by these Articles, the unaltered provisions of that part shall remain in effect.

### Article 4. DRAWINGS AND SPECIFICATIONS

#### 4.4 Add the following paragraphs:

4.4 Each Contractor will be furnished without cost to him up to five (5) copies of all Contract Documents together with any and all addenda thereto. Additional copies may be obtained from the Engineer for the cost of printing and delivery of the additional copies so obtained.

### Article 10. SURVEYS, PERMITS, REGULATIONS

Add the following paragraph:

10.4 If, during the course of any land disturbance related to the project, any bones, artifacts, foundations, or other indications of past human occupation of the area are uncovered, work at this location shall be temporarily stopped and the State Historic Preservation Officer at 3 East Main, Vermillion, SD (605)677-5314 shall be notified at once.

### Article 11. PROTECTION OF WORK, PROPERTY AND PERSONS

#### 11.3 At the end of the paragraph add the following:

..., if it is determined by the Engineer that deviation from the Contract was necessary to prevent threatened damages, injury or loss

Add the following paragraphs:

11.4 The Contractor shall protect, shore, brace, support and maintain all underground pipes, conduits, drains and other underground construction uncovered or otherwise affected by the construction work performed by him. All pavements, surfacing, driveways, curbs, walks, buildings, utility poles, guy wires and other surface structures affected by construction operations in connection with the performance of the contract, together with all shrubs in yards and parkings crossed by or adjacent to the pipeline shall be maintained, and if removed or otherwise damaged, shall be restored to

the original condition thereof as determined and approved by the Resident Project Representative. All replacements of such underground construction and surface structures or parts thereof shall be made with new materials conforming to the requirements of these specifications or, if not specified, as approved by the Engineer.

- 11.5 The Contractor shall be responsible for all damage to streets, roads, highways, ditches, shoulders, embankments, culverts, bridges or other public or private property or facility, regardless of location or character, which may be caused by moving, hauling, or otherwise transporting equipment, materials or men to or from the work or any site thereof, whether by him or his subcontractor(s). The Contractor shall make, without delay, satisfactory and acceptable arrangement with the owner(s) of or the agency or authority having jurisdiction over the damaged property, surface, structure, or facility concerning its repair or replacement or payment of costs incurred in connection with said damage.
- 11.6 Public Convenience: During the progress of the work, the convenience of the local public and of residents along the work shall be considered and, where possible their rights of access shall be preserved. Temporary driveways, approaches and crossings shall be provided where practicable and maintained in good condition. Construction materials shall be so stored or stockpiled as to cause as little obstruction as possible and still be readily accessible for use or inspection.
- 11.7 Barricades and Lights: All open trenches and other excavations shall be provided with suitable barriers, signs and lights to the extent that adequate protection is provided to the public against accident by reason of such open construction. Obstructions such as material piles and equipment shall be provided with similar warning signs and lights.

All barricades and obstructions shall be illuminated by means of acceptable warning lights at night and all lights used for this purpose shall be kept burning from sunset to sunrise. Materials stored upon or alongside public streets, roads and highways shall be so placed that the work at all times shall be so conducted as to cause the minimum obstruction and inconvenience to the traveling public.

All barricades, signs, warning lights and other protective devices shall be installed and maintained in conformance with applicable statutory requirements and where within highway right-of-ways as required by the authority having jurisdiction thereover.

Article 15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

15.3 Delete the entire paragraph and add the following:

The said amount for Liquidated Damages as set forth below is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain. Said amount is agreed to be the amount of damages which the Owner would sustain and said amounts shall be retained by the Owner from current periodic payments.

15.3.1 The Contractor shall complete construction by October 28, 1988.

Should the Contractor fail to meet the above schedule of construction, he shall and hereby agrees, to pay liquidated damages of fifty dollars (\$50.00) for each consecutive calendar day thereafter that the project is not determined operational by the Resident Project Representative.

15.3.2 Time Adjustment: The preceding completion date is based upon a Notice of Award effective on or before September 30, 1988. Should such be effective after September 30, 1988, the completion date will be adjusted accordingly, day for day.

Article 17. SUBSURFACE CONDITIONS

Add the following paragraph:

17.3 The location of underground facilities is not shown on the Drawings.

17.3.1 The Contractor shall have full responsibility for locating all existing underground facilities including water drainage projects affected by construction, for contact with owners of affected underground facilities, and for such other requirements as may be included in the specifications, the cost of all of which will be considered as incidental to the Contract Price.

17.3.2 Information, data and drawings describing existing drainage facilities required to be filed by SDCL Chapter 46A-10 may be obtained from the office of the respective County Auditors.

17.3.3 Information, data or drawings describing existing underground facilities or utilities are not a part of the Contract Documents.

17.4 Information and data relative to naturally occurring subsurface physical conditions.

17.4.1 In the preparation of Drawings and Specifications, the Engineer may have obtained, reviewed or been informed of subsurface information not specifically collected for design or construction of this project. Such information was of a general nature and available from sources normally open to the general public.

17.4.2 Printed information available to the Engineer during project design, including reports referenced above, is available at the office of the Engineer for examination during regular business hours.

17.4.3 Because the Owner and Engineer have no control over the methods used for obtaining, evaluating or recording subsurface information, and because the area sampled during subsurface investigation is small in comparison to the project area, and for other reasons, the Owner and Engineer shall not be responsible for the accuracy or completeness of subsurface information or data, or for any interpretation of such information by the Contractor.

17.4.4 Subsurface information or data referenced herein are not a part of the Contract Documents.

Article 21. INSURANCE

21.1 Modify the first sentence as follows:

".....insurance that will protect it, the Owner and the Engineer from claims...."

21.5 In the first line delete:

"....., if applicable,....."

Add the following paragraph:

21.5.1 The amount of such insurance shall not be less than the maximum value of materials stored at the project site at any one time.

Add the following paragraphs:

21.6 Each Contractor shall carry insurance for employers liability not less than \$500,000.00 for each occurrence, and bodily injury and property damage with a combined single limit of liability of \$1,000,000.00 for each occurrence.

Bodily injury and property damage insurance shall be written under the comprehensive general and comprehensive liability policy forms, including coverage for all owned, hired, and non-owner automobiles. The Contractor may, at his option, provide the limits of liability as set forth above by a combination of the above described policy forms and an umbrella excess liability policy.

It is the condition of the contract that the policy or policies afford: (1) broad form property damage liability and (2) coverage for damage to property of others arising out of explosions, collapse or damage to underground facilities.

Approval of the insurance by the Owner shall not in any way relieve or decrease the liability of the Contractor hereunder and it is expressly understood that the Owner does not in any way represent that the above required insurance or limits of liability are sufficient or adequate to protect the Contractor's interest or liabilities. It is further understood and agreed that all responsibility for payment of any deductible provisions of the policy or policies shall remain with the Contractor.

21.7 Satisfactory Coverage: In the event that the form and policy certificates or the amount of the insurance or the companies writing same are not satisfactory to the Owner, the Contractor shall secure other policies or certificates in form and amount with companies satisfactory to the Owner. The Contractor shall not cause any policies to be cancelled or permit them to lapse, and all insurance policies shall include a clause to the effect that the policy shall not be cancelled or changed until fifteen (15) days after the Owner has received written notice as evidenced by the return receipt of registered letter.

21.8 Proof of Carriage of Insurance: "Certificates of Insurance" shall contain true transcripts from the policy, authenticated by the proper officer of the insurer, evidencing in particular those insured, the extent of the insurance, the location and operations to whom the insurance applies, the effective date and expiration date and the notice of cancellation clause mentioned herein above.

## Article 26. SUBCONTRACTING

26.2 Modify the paragraph to read:

"....., in excess of twenty-five percent (25%) of the Contract Price, ....."

Article 32. METHOD OF AWARD

At the end of the General Conditions add the following Article:

32 METHOD OF AWARD:

32.1 Award will be made to the lowest, responsive,  
responsible BIDDER.

\* \* \* END OF SECTION \* \* \*

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 intended Work and the Contractor's duties and use of premises.

PART 2 - CONTRACTS

2.01 CONSTRUCTION OF DESMET WELL NO. 4 (This Contract):

- A. Test drilling, approximately 8 holes, each approximately 40 to 80 feet deep.
- B. Observation well construction, approximately 6 observation wells, each approximately 40 to 80 feet deep.
- C. Production well, one required, approximately 40 to 80 feet deep.

2.02 WORK BY OTHERS:

- A. Pitless adapter and submersible pump.
- B. Construction of berm.
- C. Raw water pipeline.
- D. Electrical and control work.

PART 3 - CONTRACTOR-OWNER RESPONSIBILITIES

3.01 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.
- 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 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.

### 3.02 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.

3.03 OWNER FURNISHED PRODUCTS:

- A. None.

\* \* \* END OF SECTION \* \* \*

SECTION 01080

APPLICABLE CODES

PART 1 - GENERAL

1.01 CODES AND STANDARDS:

A. Design and workmanship of installation and material 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.

\* \* \* END OF SECTION \* \* \*

## SECTION 01095

### EXISTING UTILITIES AND UNDERGROUND OBSTRUCTIONS

#### 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 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.
- C. 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 Prices.

##### 3.02 UTILITY CONTACT:

- A. Prior to Work in a specific area affecting underground utilities, all utilities with underground lines in the area shall be contacted by the Contractor.

3.03 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.
- B. When a utility cable is exposed, the Contractor shall compact the backfill beneath the exposed cable before completion of the backfill operation.

\* \* \* END OF SECTION \* \* \*

## SECTION 01340

### SHOP DRAWINGS, PRODUCT 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 PRODUCT 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 ten (10) days before date reviewed submittals will be needed.

- B. Submit five (5) 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 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 Documents.
  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.

### 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 and the GENERAL REQUIREMENTS (Division 1) 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).

### 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.

\* \* \* 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.

3.03 TEMPORARY ACCESS ROADS:

- A. If needed shall be the responsibility of the Contractor.
- B. Shall be approved by the appropriate township, county or state officials and meet the construction requirements of such officials.

\* \* \* 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. If required, the Contractor shall obtain appropriate discharge permits. The Contractor shall be responsible for any environmental damage which results from his activities.

- D. At all times keep premises free from accumulations of waste material and rubbish.
- E. 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.
- F. 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 in accordance with the Contract Documents.

1.02 SUBMITTALS:

- A. The Contractor shall furnish a pay request monthly on forms provided by the Engineer.

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 Engineer, 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 or stored on the site.
- C. Payment requests for stored materials shall be supported by invoices for same. Material inventory control procedures shall identify reduction for material used in completed Work.
- D. 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 PAYMENTS TO BE WITHHELD:

- A. Applicable retainage, as defined in the Contract Conditions, shall apply to all payments due the Contractor including payment for stored material.
- B. Amounts equal to maximum potential liquidated damages may be withheld from payments due Contractor when Work is not completed within the specified time. Such amounts shall be in addition to other payments withheld.
- C. Payments withheld will be paid as follows:
  - 1. Normal retainage will be paid as required by the General Conditions.
  - 2. Potential liquidated damages withheld will be retained until final resolution of Liquidated Damages is made by the Owner.

### 3.04 PAYMENT ITEMS:

- A. Test drilling, observation and production well construction, test pumping, well completion, and appurtenant work:
  - 1. Test drilling mobilization.
    - a. Measurement: The number of mobilizations ordered.
    - b. Payment: Contract unit price.
  - 2. Test hole and observation well drilling, including sampling and records.
    - a. Measurement: From ground surface to bottom of hole.
    - b. Payment: Contract unit price.

3. Completion of test hole as observation well, including screen, casing, gravel pack and seal.
  - a. Measurement: From ground surface to bottom of screen.
  - b. Payment: Contract unit price.
4. Observation well development, water sample collection and disinfection.
  - a. Measurement: The completed work.
  - b. Payment: Contract unit price.
5. Furnish and install concrete surface seal and protective posts for permanent observation wells.
  - a. Measurement: The completed work.
  - b. Payment: Contract unit price.
6. Abandonment of observation wells.
  - a. Measurement: The completed work.
  - b. Payment: Contract unit price.
7. Production well mobilization.
  - a. Measurement: The number of mobilizations ordered.
  - b. Payment: Contract unit price.
8. 20" production well drilling, including samples and records.
  - a. Measurement: From ground surface to bottom of hole.
  - b. Payment: Contract unit price.
9. 12" steel casing.
  - a. Measurement: The installed length.
  - b. Payment: Contract unit price.
10. 12" stainless steel screen.
  - a. Measurement: The installed length.
  - b. Payment: Contract unit price.

11. Gravel pack.
  - a. Measurement: The installed length.
  - b. Payment: Contract unit price.
12. Cement grout seal.
  - a. Measurement: The installed length.
  - b. Payment: Contract unit price.
13. Production well development.
  - a. Measurement: The completed work.
  - b. Payment: Contract lump sum price.
14. Installation and removal of temporary discharge piping.
  - a. Measurement: The installed length.
  - b. Payment: Contract unit price.
15. Installation and removal of test pump and equipment.
  - a. Measurement: The completed work.
  - b. Payment: Contract lump sum price.
16. Test pumping, observations and records for maximum 72-hour test.
  - a. Measurement: Duration of test.
  - b. Payment: Contract unit price.
17. Recovery observations and records.
  - a. Measurement: Duration of observations.
  - b. Payment: Contract unit price.
18. Collection of water samples, disinfection and cap.
  - a. Measurement: The completed work.
  - b. Payment: Contract lump sum price.

- B. 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 02671

### TEST DRILLING AND OBSERVATION WELLS

#### 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. The Contractor shall furnish and install all equipment, materials, labor, and appurtenances required and necessary for:
  - 1. Test drilling within the project area.
  - 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 satisfactory 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. The observation wells shall be finished to the bottom of the water bearing formation.

- 3. 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: 4 inch minimum diameter.

- b. Casing material:

- (1) Schedule 40 PVC or
- (2) Galvanized iron pipe.

- c. Screen material:

- (1) Factory slotted schedule 40 PVC or
- (2) Wire wound stainless steel.

- d. Gravel packing.

- e. Grout.

- f. Development of well and water sample as specified.
- g. Abandonment if requested by Owner.
- 4. 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 FITTINGS:

- A. Materials:
  - 1. Slot cut Schedule 40 PVC well screen with PVC cap at bottom or
  - 2. Wire wound stainless steel well point.
- 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 suited 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 contain a high percentage of clay or bentonite to minimize shrinkage of the slurry within the annular space. It shall be a mixture of 10 percent by weight of bentonite added to clean water or approximately 5 percent bentonite added to drilling mud. Bentonite shall contain 85 percent of the mineral montmorillonite and shall meet American Petroleum Institute specification standard 13A (March 1966). Saline, acid or alkaline substances or other additives to cause a temporary increase in viscosity of the bentonite slurry are not permitted.

#### 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.

#### 3.02 DRILLING AND SAMPLING PROCEDURE:

##### A. Exploratory Test Holes:

1. Accurate material samples shall be collected from each succeeding formation encountered and at every five (5) ft. interval in the water bearing formations.
2. 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.

3. The Contractor shall keep a written log of the formations, giving accurate descriptions of the materials and whether or not they are water-bearing.
4. All drilling fluid loss shall be accurately tabulated during the drilling operation.

### 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 sand-free water.
- B. Each observation well shall be developed so that the water level in the well 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 and the GENERAL REQUIREMENTS (Division 1) 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 wells.
- C. The quantities detailed in the Bid Schedule are based on test holes of record completed in the general area shown in the Drawings. Logs of previous test holes are included in the Appendix
  - 1. The number, location and depth of production wells shall be determined by the Engineer as the test drilling, well construction and test pumping 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. 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 area of test drilling and well construction is as shown on 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 2-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. Johnson wire-wound, continuous-slot type stainless steel screen.
  - 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. Minimum wall thickness and weight shall be as follows:

| <u>Nominal<br/>Casing<br/>Diameter</u> | <u>Wall<br/>Thickness<br/>in Inches</u> | <u>Weight<br/>in Pounds<br/>per Foot</u> |
|----------------------------------------|-----------------------------------------|------------------------------------------|
| 4                                      | 0.237                                   | 10.79                                    |
| 5                                      | 0.250                                   | 14.62                                    |
| 6                                      | 0.250                                   | 18.97                                    |
| 8                                      | 0.322                                   | 28.55                                    |
| 10                                     | 0.365                                   | 40.48                                    |
| 12                                     | 0.375                                   | 49.56                                    |

### 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 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 GENERAL:

- A. Construct production 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. At the Contractor's option, the well may be drilled using the reverse or direct rotary method, or the false casing method.

### 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 shall be rigidly installed and fastened by full circumferential welded joints in accordance with AWWA C206.
- 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 outer casing 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 or concrete 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 methods of developing to be used shall be submitted to and approved by the Engineer. The minimum development time considered acceptable for the well is 8 hours. The Contractor shall provide such additional development time as required for the well at no additional cost to the Owner to meet the efficiency requirements specified below and to develop the well to a sand-free condition.
- B. 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.
- C. The process shall be continued until the water from the well runs clear and continues to run clear after periods of stopping and starting of the development pumping equipment while pumping the well at a rate of up to 1,000 gallons per minute.
- 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. 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.
- F. Failure by the Contractor to construct a well with an efficiency of 70 percent or higher, as defined above, or to construct a sand-free well, 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 well for plumbness and alignment.
- 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 20 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 to 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 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 tested per 100 feet of depth, or beyond limitations of this test. (Requirement for plumbness).
2. Should the Contractor fail to correct such faulty alignment of 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 the 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 and the GENERAL REQUIREMENTS (Division 1) 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 production well will consist of a maximum 72-hour drawdown test followed by a maximum 24-hour recovery observation period, with drawdown observations 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 initially indicated, 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 initially indicated period. A corresponding addition to recovery reading time may also be made. Such extensions of the test pumping and recovery periods shall be made with no change in the unit hourly cost.

### 3.03 TEST PUMP:

- A. The Contractor shall furnish and install necessary pumping equipment required for pumping of the well.
- B. The pump shall be capable of pumping to the required point of discharge at least 500 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 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 two (2) water level sounding devices capable of indicating drawdown to the nearest 1/8 inch or 0.01 foot in the production 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 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 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 disinfect and or abandon observation wells and production wells.
- C. Related requirements specified elsewhere:
  - 1. Test Hole Drilling and Observation Wells: Section 02671.
  - 2. Production Wells: Section 02672.

##### 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

- 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 observation and production 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.
- D. Disinfection procedures are to be conducted for both the observation wells and the production wells.

### 3.02 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<br>Casing<br>diameter<br>(inches) | Approx.<br>Volume<br>100 ft.<br>(gals) | Chlorine Compounds                              |                                                 |
|-------------------------------------------|----------------------------------------|-------------------------------------------------|-------------------------------------------------|
|                                           |                                        | 70% HTH<br>Perchloron,<br>etc.<br>(dry weight)* | 5.25% Purex<br>Clorox, etc.<br>(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, expecially 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.

### 3.03 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.

### 3.04 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 abandon the well because of loss of tools, negligence, or for any other cause, he shall, if required and as directed by the Owner, and 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.
- B. Upon the request of the Owner, the Contractor shall properly abandon any and all observation wells and production wells for the unit prices quoted. Salvaged casing and screen materials shall remain the property of the Contractor.

### 3.05 PERMANENT ABANDONMENT OF WELLS:

- A. A well that is to be permanently abandoned shall be filled to prevent contaminating materials from entering the water-bearing ground formations. Concrete or cement grout shall be used for sealing material; however, if the well is so large that the use of these materials is not practical, the filling materials should be selected so as to restore natural conditions as nearly as possible. Sand and heavy drilling fluid may be used in sand and gravel sections of wells.

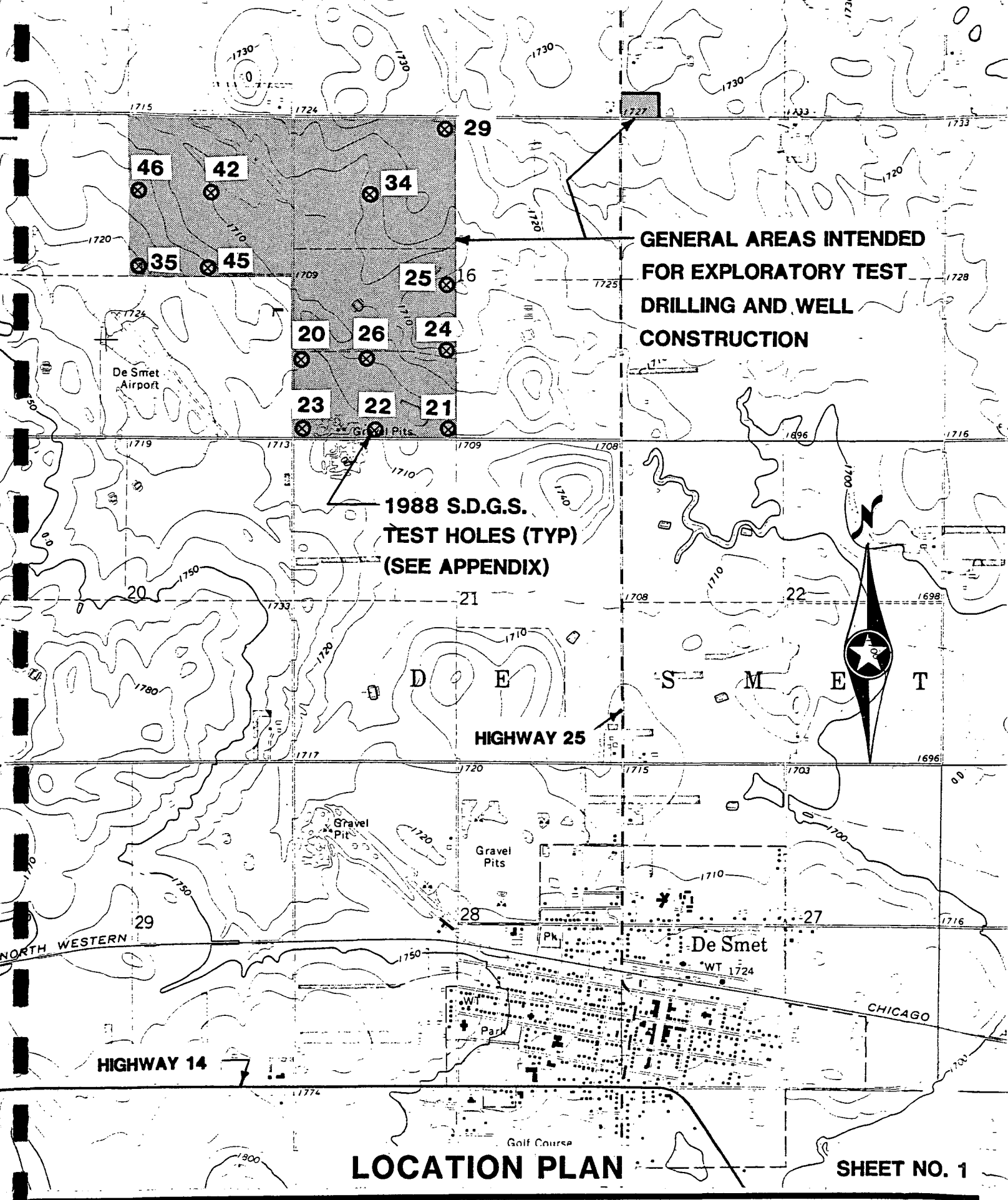
- B. All materials debris and obstructions that may interfere with sealing operations shall be removed from the well. Liner pipe shall be removed or perforated when necessary to assure placement of an effective seal. The State agency which regulates well construction will be consulted for instruction in case of abandonment of a contaminated well or where there is a question of proper procedure.
- C. All casing and screen may be salvaged except casing that has been cemented in place. The well shall be filled with appropriate sealing materials.
- D. The top of the hole shall be filled with 10 feet of concrete grout to within 2 feet of the land surface. Casing remaining in the hole shall be cut off at least 2 feet below land surface. The remaining top 2 feet of hole shall be filled with native top soil.
- E. An abandoned well shall be filled and sealed by one of the following methods in accordance with the materials penetrated, in such a manner as to prevent it from acting as a channel for pollution:
  - 1. A well in unconsolidated deposits shall be filled with clean sand and puddled clay or concrete grout to provide a permeability no greater than the natural condition.
  - 2. The section of a well in a cavernous or creviced rock (such as cavernous limestone or basalt lava crack, creviced granite, etc.) shall be filled with concrete grout or alternate layers of concrete grout, gravel or stone aggregate. The filling shall be completed at the top by a layer of cement grout extending at least ten feet (10 ft.) into the above overlying formation.
  - 3. When concrete grout, puddled clay or heavy drilling fluid is used for sealing an abandoned well, it shall be inserted in the well through a grout pipe from the bottom of the well upward to the surface under pressure and in one continuous operation.
  - 4. Test wells shall be sealed to prevent the well from being a channel for the vertical movement of water and a source of contamination to the groundwater supply.

3.06 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 \* \* \*

DRAWINGS



# LOCATION PLAN

SHEET NO. 1



DeWild Grant Reckert & Associates Co.  
Denver, Colorado  
Rock Rapids, Iowa  
Sioux City, Iowa  
Sioux Falls, South Dakota

Date  
Drawn By  
Approved  
Revised

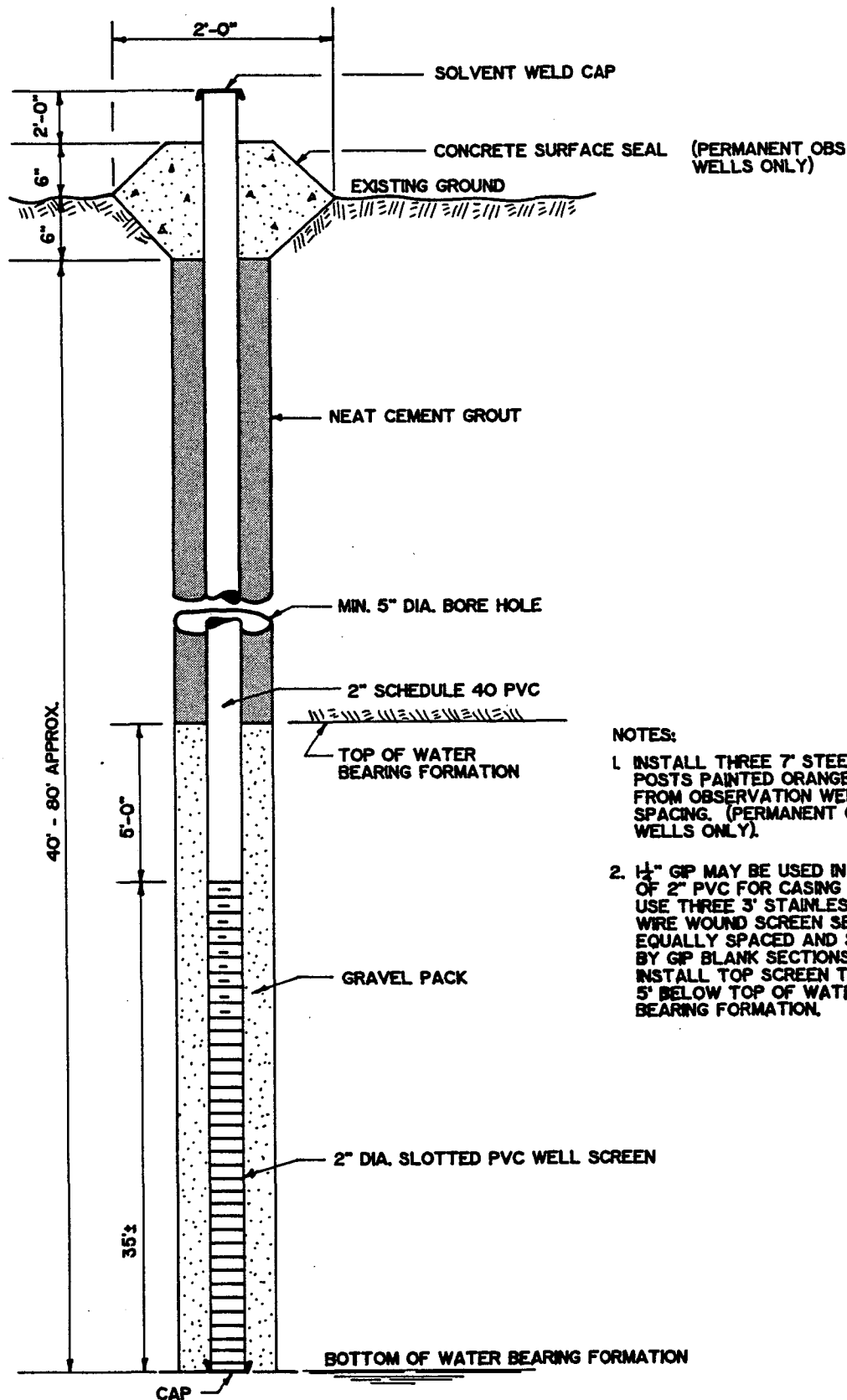
9/88  
BH  
GJP

DESMET WELL NO. 4  
KINGBROOK RWS

PROJ. NO. 3729



**SHEET NO. 2**



## NOTES:

1. INSTALL THREE 7' STEEL FENCE POSTS PAINTED ORANGE 1 FOOT FROM OBSERVATION WELL, 120° SPACING. (PERMANENT OBS. WELLS ONLY).
2. 1 1/2" GIP MAY BE USED IN LIEU OF 2" PVC FOR CASING PIPE. USE THREE 3' STAINLESS STEEL WIRE WOUND SCREEN SECTIONS EQUALLY SPACED AND SEPARATED BY GIP BLANK SECTIONS. INSTALL TOP SCREEN TO APPROX. 5' BELOW TOP OF WATER BEARING FORMATION.

SECTION VIEW  
OBSERVATION WELL  
NOT TO SCALE

SHEET NO. 3



DeWild Grant Reckert & Associates Co.  
Denver, Colorado  
Rock Rapids, Iowa  
Sioux City, Iowa  
Sioux Falls, South Dakota

Date  
Drawn By  
Approved  
Revised

9/88  
BH  
GJP

DESMET WELL NO. 4  
KINGBROOK RWS

PROJ. NO. 3729

APPENDIX

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook RW Study Location 111 N 56 W 16 C C O B  
County Kingberry Well no. Co 88-20 Test hole no. \_\_\_\_\_  
Driller(s) A. J. Johnson Geologist/Hydrologist Kurt Wilkie  
Start Date June 22 Finish Date June 22 Elevation 1720 Total hole depth 77  
Method: (R) A HSA E-log (y) Disinfectant: y (n) Lubricant: y (n) Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 15 ft. Tremie pipe/drill stem depth 15  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.7 lbs.  
WELL BACKFLUSHED: y n Number of gallons 900

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts 3  
Total casing and screen 76 ft. Total casing length 51 ft. Stick-up 2 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
FG. SCR: Length 10 ft. from 49 ft. to 59 ft. Diameter 2 in.  
Slot size .016 in. Bottom notched: y (n) Schedule 80 glued threaded  
Type PVC Bottom open: y (n) Notes \_\_\_\_\_  
M.M.D. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 15 ft. Bottom open: y (n) Top notched: (y) n  
Bottom notched: (y) n Top open to screen: y (n)

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from 76 ft. to 15 ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_



## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Hinglebrook Res Study Location 111 N 56 W 16 E 22 D  
County Hinglebrook Well no. \_\_\_\_\_ Test hole no. C088-21  
Driller(s) A. Johnson Geologist/Hydrologist Art Wilke  
Start Date June 22 Finish Date June 22 Elevation 1712 Total hole depth 57  
Method: ☒ A HSA E-log: ☒ n Disinfectant: y ☒ n Lubricant: y ☒ n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 56 ft. Tremie pipe/drill stem depth 56  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.8 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
CFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
M. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

| Location |
|----------|
|----------|

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingsbrook RW Study Location HN 564-16 C.D.C.C.  
County Kingsberry Well no. C088-22 Test hole no. \_\_\_\_\_  
Driller(s) R. Jackson Geologist/Hydrologist Kurt Wilke  
Start Date June 23 Finish Date June 23 Elevation 1712 Total hole depth 57  
Method: ☒ A HSA E-log: ☒ n Disinfectant: y ☒ n Lubricant: y ☒ n Type \_\_\_\_\_  
Bit Dia. 3 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 34 ft. to 0 ft. Tremie pipe/drill stem depth 34  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts 3  
Total casing and screen 56 ft. Total casing length 10 ft. Stick-up 26 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
CFG. SCR: Length 10 ft. from 36 ft. to 46 ft. Diameter 2 in.  
Slot size 0.16 in. Bottom notched: y ☒ n Schedule 80 glued threaded  
Type PVC Bottom open: y ☒ n Notes \_\_\_\_\_  
M.MD.SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from 56 ft. to 34 ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

| Location |
|----------|
|----------|

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook R.W. Study Location 11N 56W-16  
County King Well no. C088-23 Test hole no. 2000  
Driller(s) J. J. Fisher Geologist/Hydrologist Kurt Wilke  
Start Date June 27 Finish Date June 27 Elevation 1716 Total hole depth 67  
Method: EA HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 44 ft. to 0 ft. Tremie pipe/drill stem depth \_\_\_\_\_  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: y n Number of gallons 1000

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts 3  
Total casing and screen 66 ft. Total casing length 36 ft. Stick-up 2 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 50 ft. to 60 ft. Diameter 2 in.  
Slot size 0.16 in. Bottom notched: y n Schedule 80 glued threaded  
Type PVC Bottom open: y n Notes \_\_\_\_\_  
1. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 5 ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from 65 ft. to 44 ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

Location

| Footage | Lithologic Description                                                                                                                                  | Driller's Notes |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 0-5     | Black top soil                                                                                                                                          |                 |
| 5-30    | Coarse gravel Boulders                                                                                                                                  |                 |
| 30-32   | gray sand till clay                                                                                                                                     |                 |
| 32-47   | gravel med                                                                                                                                              |                 |
| 47-50   | gray sandy till clay                                                                                                                                    |                 |
| 50-57   | gravel med                                                                                                                                              |                 |
| 57-67   | gray sandy till                                                                                                                                         |                 |
|         |                                                                                                                                                         |                 |
|         |                                                                                                                                                         |                 |
|         |                                                                                                                                                         |                 |
|         |                                                                                                                                                         |                 |
|         |                                                                                                                                                         |                 |
|         |                                                                                                                                                         |                 |
|         |                                                                                                                                                         |                 |
|         |                                                                                                                                                         |                 |
| 0-5     | Topsoil, black, organic; oxidized                                                                                                                       |                 |
| 5-28    | Gravel <sup>and sand</sup> , reddish-yellow, coarse gravel, cobble to boulder (?) size, sandy, poorly sorted, oxidized, calcareous matrix, Mn staining. |                 |
| 28-31   | Silt, gray, slightly sandy and pebbly; coal fragments; unoxidized calcareous.                                                                           |                 |
| 31-47   | Gravel, grayish, coarse to fine, sandy, poorly sorted, unoxidized, calcareous matrix.                                                                   |                 |
| 46-48   | Silt, gray, clayey, slightly sandy; unoxidized, calcareous. Resistivity indicates possible pebbles - but not confirmed by gravel. ←                     |                 |
| 48-59   | Gravel, grayish, coarse to fine, sandy, unoxidized, calcareous matrix.                                                                                  |                 |
| 59-67   | Clay, gray, very silty, sandy, pebbly; unoxidized, calcareous. (Till)                                                                                   |                 |
|         |                                                                                                                                                         |                 |
|         |                                                                                                                                                         |                 |
|         |                                                                                                                                                         |                 |
|         |                                                                                                                                                         |                 |
|         |                                                                                                                                                         |                 |

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project King Brook RW Study Location 41N 56W 16 CAD  
County King Well no. C088-27 Test hole no. \_\_\_\_\_  
Driller(s) D. Jacobson Geologist/Hydrologist Kurt Wilke  
Start Date June 28 Finish Date June 28 Elevation 1711 Total hole depth 37  
Method: B A HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 10 ft. Tremie pipe/drill stem depth 10  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: y n Number of gallons 200

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts 3  
Total casing and screen 38 ft. Total casing length 16 ft. Stick-up 2 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 24 ft. to 14 ft. Diameter 2 in.  
Slot size 0.16 in. Bottom notched: y n Schedule 80 glued threaded  
Type PVC Bottom open: y n Notes \_\_\_\_\_  
1. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 12 ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from 10 ft. to 36 ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

| Location |
|----------|
|----------|

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook RW Study Location 111 N 56 W 16 BDDO  
County King Well no. \_\_\_\_\_ Test hole no. CO 88-25  
Driller(s) D. Jacobson Geologist/Hydrologist Kurt Wilke  
Start Date June 28 Finish Date June 28 Elevation 1709 Total hole depth 37  
Method BA HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 37 ft. Tremie pipe/drill stem depth 37  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.7 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
M.MD.SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

| Location |
|----------|
|----------|

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook BW Study Location 111N 56W 16 C BDD  
County Kingberry Well no. Co 88-26 Test hole no. \_\_\_\_\_  
Driller(s) A. Jacobson Geologist/Hydrologist Kurt Wilke  
Start Date June 28 Finish Date June 28 Elevation 1711 Total hole depth 57  
Method: BA HSA E-log: y n Disinfectant: 40 Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 25 ft. to 0 ft. Tremie pipe/drill stem depth 25  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.  
WELL BACKFLUSHED: y n Number of gallons 1000

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts 3  
Total casing and screen 58 ft. Total casing length 30 ft. Stick-up 2 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 28 ft. to 38 ft. Diameter 2 in.  
Slot size 0.016 in. Bottom notched: y n Schedule 80 glued threaded  
Type PVC Bottom open: y n Notes \_\_\_\_\_  
M.MD.SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 18 ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from 57 ft. to 25 ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

| Location |
|----------|
|----------|

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project King Brook RW Study Location 111 N 56 W 16 BAAA  
County King Well no. \_\_\_\_\_ Test hole no. 098 29  
Driller(s) D. Jacobson Geologist/Hydrologist Kurt Walker  
Start Date June 30 Finish Date June 30 Elevation 1714 Total hole depth 57  
Method: (R) A HSA E-log: y (n) Disinfectant: y (n) Lubricant: y (n) Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 57 ft. Tremie pipe/drill stem depth 57  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
WELL BACKFLUSHED: y n Number of gallons 8.7

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
M.MD.SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

| Location |
|----------|
|----------|

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project King Creek RW study Location 11N 56W 10 BDD  
County King Well no. \_\_\_\_\_ Test hole no. 0288-34  
Driller(s) A. Janda Geologist/Hydrologist Kurt Wilke  
Start Date July 6 Finish Date July 6 Elevation 1714 Total hole depth 47  
Method: R A HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0 ft. to 47 ft. Tremie pipe/drill stem depth 47  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.8 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
M.MD.SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n  
CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_  
FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_  
Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

**Location**

~~This report and/or map is preliminary and has not been edited or reviewed for conformity with State Geological Survey standards or nomenclature.~~

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Hing Brook RW study Location 41N 56W 17 A 000  
County Hingbury Well no. 0088-35 Test hole no. \_\_\_\_\_  
Driller(s) D. Jacobson Geologist/Hydrologist Kurt W. Abie  
Start Date July 6 Finish Date July 6 Elevation 1722 Total hole depth 77  
Method BA HSA E-log: y n Disinfectant: y n Lubricant: y n Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 45 ft. to 0 ft. Tremie pipe/drill stem depth 86  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.7 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
LANDSCAPED y n Notes \_\_\_\_\_

## WELL MATERIALS

Number of fence posts 3  
Total casing and screen 56 ft. Total casing length 46 ft. Stick-up 2.5 ft.  
Diameter 2 in. Type PVC Schedule 80 glued threaded  
MFG. SCR: Length 10 ft. from 56 ft. to 46 ft. Diameter 2 in.  
Slot size 0.16 in. Bottom notched: y n Schedule 80 glued threaded  
Type PVC Bottom open: y n Notes \_\_\_\_\_  
M.MD.SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 20 ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from 76 ft. to 45 ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

and has not been edited or reviewed for  
Location conformity with State Geological Survey

[illegible]

SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG  
Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingbrook RW Study Location 11 N 56 W 17 AR HA  
County Kingbury Well no. \_\_\_\_\_ Test hole no. CO 88 - (42)  
Driller(s) P. J. Jenson Geologist/Hydrologist Burt Wilkes  
Start Date July 12 Finish Date July 12 Elevation 1711 Total hole depth 57  
Method: (R) A HSA E-log: (y) n Disinfectant: y (n) Lubricant: y (n) Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_  
BENTONITE GROUT: from 0-57 ft. to 57 ft. Tremie pipe/drill stem depth 57  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.7 lbs.  
WELL BACKFLUSHED: y n Number of gallons \_\_\_\_\_

SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_  
Initial Bentonite top \_\_\_\_\_ ft. below surface  
BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.  
Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.  
Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_  
CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_  
Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_

LANDSCAPED y n Notes \_\_\_\_\_

WELL MATERIALS

Number of fence posts \_\_\_\_\_  
Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.  
Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded  
MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Bottom open: y n Notes \_\_\_\_\_  
HM. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.  
Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threaded  
Type \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n  
Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y n Top notched: y n  
Bottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

and has not been edited or reviewed for  
Location conformity with State Geological Survey

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project King Basin RW Study Location 44N56W 12 ADC  
County King Well no. C-88 Test hole no. 45  
Driller(s) D Jackson Geologist/Hydrologist Kurt W. White  
Start Date July 13 Finish Date July 13 Elevation 1732 Total hole depth 77  
Method: BA HSA E-log: y Disinfectant: y Lubricant: y Type Q  
Bit Dia. 4 3/4 in. Core: y n Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.

Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_

Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_

BENTONITE GROUT: from 45 ft. to 0 ft. Tremie pipe/drill stem depth 35Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.WELL BACKFLUSHED: y n Number of gallons 800

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_

Initial Bentonite top \_\_\_\_\_ ft. below surface

BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.

Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.

Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_

Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_

LANDSCAPED y n Notes \_\_\_\_\_WELL MATERIALS Number of fence posts 3Total casing and screen 66 ft. Total casing length 56 ft. Stick-up 2 ft.Diameter 2 in. Type PVC Schedule 80 glued threadedMFG. SCR: Length 10 ft. from 64 ft. to 54 ft. Diameter 2 in.Slot size 9/16 in. Bottom notched: y n Schedule 80 glued threadedType PVC Bottom open: y n Notes \_\_\_\_\_

1. MD. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.

Slot size \_\_\_\_\_ in. Bottom notched: y n Schedule \_\_\_\_\_ glued threadedType \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y n

Notes \_\_\_\_\_

BLANK CASING BELOW SCR: Length 12 ft. Bottom open: y n Top notched: y nBottom notched: y n Top open to screen: y n

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from 77 ft. to 45 ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

and has not been edited or reviewed for  
Location conformity with State Geological Survey

[illegible]

## SOUTH DAKOTA GEOLOGICAL SURVEY TEST HOLE AND WELL LOG

Science Center, University of South Dakota, Vermillion, SD 57069

Project Kingsbrook RW study Location 11N56W 17 ACBB  
County Kingsbury Well no. \_\_\_\_\_ Test hole no. C-85-46  
Driller(s) D. Jackson Geologist/Hydrologist Kurt Walker  
Start Date July 13 Finish Date July 13 Elevation 1736 Total hole depth 67  
Method: R A HSA E-log: y ☒ Disinfectant: y ☒ Lubricant: y ☒ Type \_\_\_\_\_  
Bit Dia. 4 3/4 in. Core: y ☒ Depth(s) \_\_\_\_\_ Diameter(s) \_\_\_\_\_

## HOLE ABANDONMENT / WELL COMPLETION

CEMENT GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.

Non-slip plug depth \_\_\_\_\_ ft. No. of bags \_\_\_\_\_ Type \_\_\_\_\_

Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_

BENTONITE GROUT: from 0 ft. to 67 ft. Tremie pipe/drill stem depth 67Marsh-funnel viscosity \_\_\_\_\_ sec. Weight 8.6 lbs.WELL BACKFLUSHED: y ☒ Number of gallons \_\_\_\_\_

## SECOND PHASE HOLE ABANDONMENT / WELL COMPLETION

Start date \_\_\_\_\_ Finish date \_\_\_\_\_ Task completed by \_\_\_\_\_

Initial Bentonite top \_\_\_\_\_ ft. below surface

BENTONITE GROUT: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Tremie pipe depth \_\_\_\_\_ ft.

Marsh-funnel viscosity \_\_\_\_\_ sec. Weight \_\_\_\_\_ lbs.

Pellets / Granular bentonite: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Non-slip plug depth \_\_\_\_\_ ft. Notes \_\_\_\_\_

CEMENT GROUT : from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Type \_\_\_\_\_ No. of bags \_\_\_\_\_

Water \_\_\_\_\_ gal/bag Bentonite \_\_\_\_\_ lbs. Sand \_\_\_\_\_

LANDSCAPED y ☒ Notes \_\_\_\_\_

WELL MATERIALS \_\_\_\_\_ Number of fence posts \_\_\_\_\_

Total casing and screen \_\_\_\_\_ ft. Total casing length \_\_\_\_\_ ft. Stick-up \_\_\_\_\_ ft.

Diameter \_\_\_\_\_ in. Type \_\_\_\_\_ Schedule \_\_\_\_\_ glued threaded

MFG. SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.

Slot size \_\_\_\_\_ in. Bottom notched: y ☒ Schedule \_\_\_\_\_ glued threadedType \_\_\_\_\_ Bottom open: y ☒ Notes \_\_\_\_\_

M. MD, SCR: Length \_\_\_\_\_ ft. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in.

Slot size \_\_\_\_\_ in. Bottom notched: y ☒ Schedule \_\_\_\_\_ glued threadedType \_\_\_\_\_ Cutting method \_\_\_\_\_ Bottom open: y ☒

Notes \_\_\_\_\_

PLANK CASING BELOW SCR: Length \_\_\_\_\_ ft. Bottom open: y ☒ Top notched: y ☒Bottom notched: y ☒ Top open to screen: y ☒

CENTRALIZERS: How many \_\_\_\_\_ Depth(s) \_\_\_\_\_

FILTER PACK: from \_\_\_\_\_ ft. to \_\_\_\_\_ ft. Grain size \_\_\_\_\_

Composition \_\_\_\_\_ Depth of Tremie pipe \_\_\_\_\_ ft. Notes \_\_\_\_\_

And has not been edited or reviewed for  
conformity with State Geological Survey  
standards.

[illegible]



# Department of Water & Natural Resources

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

September 23, 1988

## NOTICE

TO: Larry Sterling  
Kingbrook Rural Water System  
Drawer 299  
Arlington SD 57212  
and Parties of Record (see attached lists)

FROM: John Hatch, Chief Engineer *John Hatch*  
Water Rights Division  
605 773-3352

SUBJECT: Automatic Continuance of Hearing on Water Permit  
Application No. 5208-3 and Future Use Permit  
Application No. 5209-3

A petition opposing Application Nos. 5208-3 and 5209-3 has been received from Mary Lois and Marvin Ogren. A petition has also been received from William J Cronkhite. The petitions both request an automatic delay of the hearing (copies enclosed). Therefore, the hearing is automatically delayed pursuant to SDCL 46-2A-4 and 46-2A-5 and will NOT be held on October 5, 1988.

The Water Management Board will now consider Application Nos. 5208-3 and 5209-3 on December 7, 1988 at 10:30 am in Dakota A, Howard Johnson, 3300 W Russell Street, Sioux Falls SD. The agenda time is an estimate. The actual time of hearing may be later than 10:30 am due to prior agenda items. Applicable provisions of the Notice of Hearing published on September 7 and 14, 1988 in the DeSmet News will still apply at the hearing.

cc: Water Management Board  
John Guhin, Assistant Attorney General  
Larry Donovan, Assistant Attorney General



CERTIFICATION

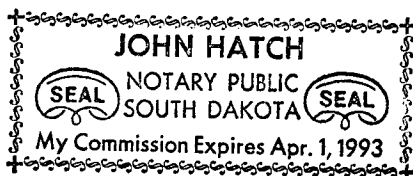
I hereby certify that on September 23, 1988 I have personally deposited with the U.S. Mail postage prepaid envelopes containing a NOTICE of Automatic Continuance of Hearing on Water Permit Application No. 5208-3 and Future Use Permit Application No. 5209-3 addressed as show the parties of record sheet.

*Karen Schlaak*

KAREN SCHLAAK  
Senior Secretary

STATE OF SOUTH DAKOTA )  
                                  ) SS  
COUNTY OF HUGHES        )

Sworn to, before me, this 30<sup>th</sup> day of September, 1988.



*John Hatch*  
Notary Public

CERTIFICATION

I hereby certify that on September 26, 1988 I have personally deposited with the U.S. Mail postage prepaid envelopes containing NOTICE of Automatic Continuance of Hearing on Water Permit Application No. 5208-3 and Future Use Permit No. 5209-3 to the two additional names added to the Parties of Record sheet: Hi Spirit Ranch and Mark A Gieb

*Karen Schlaak*

KAREN SCHLAACK  
Senior Secretary

STATE OF SOUTH DAKOTA )  
                                  ) SS  
COUNTY OF HUGHES        )

Sworn to, before me, this 30<sup>th</sup> day of September 1988.



*John Hatch*  
Notary Public

September 22, 1988



Water Management Board  
Room 216  
Joe Foss Building  
523 E Capitol  
Pierre, S. Dak. 57501

Re: Application Nos. 5208-3 and 5209-3  
to Appropriate Water

Dear Sirs:

This letter is in regards to the request by Kingbrook Rural Water System for water permits nos. 5208-3 and 5209-3. I have a commercial cattle feeding business that has been established since the early 1960's in the proposed area. There are also several neighbors with irrigation systems in and around the affected area. We all rely heavily on this source of water in drought conditions.

I am very opposed to the granting of these permits for the following reasons:

1. There are already three active rural water wells in the immediate area. If one more was to be drilled yet, that would make four wells in my area.
2. Most of our wells for farm use are no more than 25-ft. deep now. A larger usage of water out of this area may cause our wells to go dry.  
  
"A feedlot with no water is out of business."
3. Also, with wells as shallow as ours, there is a larger than normal chance of ground water contaminations from irrigation and our own feedlot.
4. The present rural water wells have never been tested under a prolonged drought conditions, such as in the 1970's.
5. At the present time, I see no need for this volume of water, so I see no reason to grant these permits.

Page 2

6. The granting of these permits will monopolize our water supply and detour any further local use or expansion in the future.

I would like the water management board to consider these reasons and deny the permits in question.

Sincerely,

A handwritten signature in cursive script, reading "Mark A. Geib".

Mark A. Geib  
Rt. 1, Box 182A  
De Smet, S. Dak. 57231  
(605) 854-3639

Dear Sir;

We also think that if Howard needs water they can find it easier than here north of De Smet.



Hi Spirit Ponah  
Bernard Lessor  
De Smet I.D.  
59231



# Department of Water & Natural Resources

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

September 26, 1988

Larry Sterling  
Kingbrook Rural Water System  
Drawer 299  
Arlington SD 57212

Dear Mr. Sterling:

This letter is to inform you that additional petitions have been submitted in regard to Water Permit Application Nos. 5208-3 and 5209-3. Enclosed are two petitions received from Bernard Larson and Mark A Geib in opposition to Application Nos. 5208-3 and 5209-3.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in cursive script, reading "Ron Duvall". The signature is written in dark ink and is positioned below the word "Sincerely,".

Ron Duvall  
Natural Resources Engineer  
605 773-3352

enc.





# Department of Water & Natural Resources

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

5208-3

October 21, 1988

Morris Elcock, Manager  
Kingbrook Rural Water System  
Drawer 299  
Arlington, South Dakota 57212

Dear Mr. Elcock:

I am writing to follow up on the public meeting in DeSmet, October 18, 1988 concerning Water Permit Applications No. 5208-3 and No. 5209-3 (future use). The concerns I heard stated by the nine people in opposition to the permit applications were:

1. That approval and development of Permits No. 5208-3 and 5209-3 may interfere with existing water use and prohibit additional irrigation development north of DeSmet.
2. Did not want water pumped from DeSmet well field to Howard.

In response to concern No. 1, I am proposing to issue revised recommendations with the following changes:

1. Condition approval of Application No. 5208-3 with the following qualification:  
  
"Approval of Permit No. 5208-3 authorizes maximum annual withdrawals under Permits No. 4137-3, 5182-3 and 5208-3 of up to 1350 acre feet."
2. Condition approval of Future Use Application No. 5209-3 with the following qualification:  
  
"Approval of Permit No. 5209-3 reserves 1100 acre feet annually."

The 1350 acre feet condition is based upon 60% of maximum continuous pumping-

|            |                                        |
|------------|----------------------------------------|
| No. 4137-3 | 1.0 cfs or 724 AF/yr @60% = 434 AF/yr  |
| No. 5186-3 | 0.7 cfs or 506 AF/yr @60% = 304 AF/yr  |
| No. 5208-3 | 1.4 cfs or 1013 AF/yr @60% = 608 AF/yr |

TOTAL 1346 AF/yr



Morris Elcock  
Page 2  
October 18, 1988

The 1100 AF future use number is based upon comments Tuesday night, October 18. Sixty percent of 2027 AF is 1216 AF.

The City of Howard should be represented at the December Water Management Board meeting in Sioux Falls to explain why the city wants water from Kingbrook Rural Water System. Your projected annual use of 1100 AF/yr from the DeSmet well field with service to Oldham, Howard and 320(?) new connections would leave 250 AF/yr ( $1350 - 1100 = 250$ ) for future expansion and increased use.

An example of an application to use a portion of the 1100 AF reserved by Future Use Permit No. 5209-3 could be:

"1.0 cfs from 2 wells and 200 AF/yr from Future Use Permit No. 5209-3 to increase annual withdrawals under Permits No. 4137-3, 5182-3, and 5208-3 from 1350 AF to 1550 AF".

Such application would then leave a reserved balance of 900 AF/yr under No. 5209-3.

Please send a copy of the October 18 meeting attendance sign up sheet and advise concerning the proposed conditions.

Very truly yours,



John Hatch, Chief Engineer  
Water Rights Division  
(605)773-3352

JH:ms  
cc: Gary Patton, DeWild, Grant, Reckert & Associates

# KINGBROOK

## RURAL WATER SYSTEM



Drawer 299

ARLINGTON, S. DAKOTA 57212

Telephone (605) 983-5074

November 1, 1988

John Hatch, Chief Engineer  
Water Rights Division  
S.D. Department of Water & Natural Resources  
Joe Foss Building  
523 East Capital  
Pierre, South Dakota 57501-3181



Dear Sir:

In regards to letter on the follow-up of the public meeting in DeSmet and your proposed changes on our permit applications. I have visited with Gary Patton, our engineer, about your recommendations and we are agreeable with them.

1. Condition approval of Application No. 5208-3 with the following qualification:

"Approval of Permit No. 5208-3 authorizes maximum annual withdrawals under Permit No. 4137-3, 5182-3 and 5208-3 of up to 1350 acre feet".

2. Condition approval of Future Use Application No. 5209-3 with the following qualification:

"Approval of Permit No. 5209-3 reserves 1100 acre feet annually.

I again want to thank you for taking time out of your busy schedule to attend the informational meeting in DeSmet on October 18, 1988. Attached is a copy of those in attendance at that meeting.

Sincerely,

Morris Elcock  
General Manager

ME:lb

# KINGBROOK

## RURAL WATER SYSTEM



Drawer 299

ARLINGTON, S. DAKOTA 57212

Telephone (605) 983-5074

| Name             | Address   |
|------------------|-----------|
| Morris Elcock    | Arlington |
| Neil Rommerein   | DeSmet    |
| Linda Rommerein  | DeSmet    |
| Stanley Anderson | DeSmet    |
| Otto Sckerl      | DeSmet    |
| William Cronkite | DeSmet    |
| Harold Whirledge | Bryant    |
| Todd Wilkinson   | DeSmet    |
| Mark Geib        | DeSmet    |
| Norman Lee       | DeSmet    |
| Mary Ogren       | DeSmet    |
| Marvin Ogren     | Desmet    |
| Bernard Larson   | DeSmet    |
| Ruth Larson      | DeSmet    |
| John Weidler     | Howard    |
| John D. Jensen   | DeSmet    |

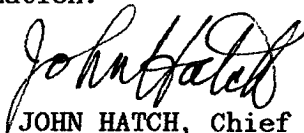
REVISED RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT  
APPLICATION NO. 5208-3, Kingbrook Rural Water System

Pursuant to SDCL 46-2A-2, the following is the REVISED recommendation of the Chief Engineer, Water Rights Division, Department of Water and Natural Resources concerning Water Permit Application No. 5208-3, Kingbrook Rural Water System, Drawer 299, Arlington SD.

The Chief Engineer is recommending APPROVAL of Application No. 5208-3 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) in the public interest with the following qualifications:

1. Wells authorized by Permit No. 5208-3 shall be spaced at least 660 feet apart and at least 660 feet from other wells.
2. The casings of the wells to be constructed under Permit No. 5208-3 shall be pressure grouted with cement (bottom to top) from the producing formation to the surface and the well constructed in compliance with Water Management Board Well Construction Rules, Chapter 74:02:04.
3. 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.
4. That the Kingbrook Rural Water system report to the chief engineer annually the amount of water withdrawn each year from the Vermillion East Fork aquifer.
5. Approval of Permit No. 5208-3 authorizes maximum annual withdrawals under Permits No. 4137-3, 5182-3, and 5208-3 of up to 1350 acre feet.

See the attached report for additional information.



JOHN HATCH, Chief Engineer  
November 7, 1988

NOTE: The maximum annual acre-feet of pumping represented by the 3.1 cubic feet per second (cfs) authorized by Nos. 4137-3, 5182-3 and 5208-3 is 2243 acre-feet annually. Assuming maximum annual pumping will equal 60% of 2243, expected maximum pumping under the three permits would be about 1350 acre-feet per year.

The projected annual use from the DeSmet well field with service to Oldham, Howard and 320 new connections is estimated to be 1100 acre feet annually. This will leave 250 acre feet per year ( $1350 - 1100 = 250$ ) for expansion and increased use.

Water use during 1988 from the DeSmet well field is expected to be about 360 acre-feet.



# Department of Water & Natural Resources

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

November 9, 1988

## NOTICE

TO: Morris Elcock, Manager  
Kingbrook Rural Water System  
Drawer 299  
Arlington SD 57212  
and Parties of Record (see attached lists)

FROM: John Hatch, Chief Engineer  
Water Rights Division  
605 773-3352

SUBJECT: Revised Recommendations for Water Permit Application No. 5208-3 and Future Use  
Permit Application No. 5209-3

Enclosed for your information are Revised Recommendations for Applications No. 5208-3 and 5209-3. The Recommendations propose qualifications that limit the number of acre-feet the Kingbrook Rural Water System may pump each year from the Vermillion East Fork groundwater aquifer north of DeSmet. The qualifications to limit annual pumping are the result of the public meeting in DeSmet, October 18, 1988.

The hearing before the Water Management Board on these applications is still scheduled for December 7, 1988 at 10:30 am in Room Dakota A, Howard Johnsons, 3300 West Russell Street, Sioux Falls SD. The agenda time is an estimate. The actual time of hearing may be later than 10:30 am due to prior agenda items. Applicable provisions of the Notice of Hearing published on September 7 and 14, 1988 in the DeSmet News will still apply at the hearing.



## CERTIFICATION

I hereby certify that on November 9, 1988 I have personally deposited with the U.S. Mail postage prepaid envelopes containing NOTICE of Revised Recommendations for Water Permit Application No. 5208-3 and Future Use Permit No. 5209-3 to those persons on the September 23, 1988 Parties of Record sheet and the following:

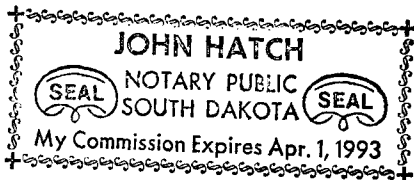
Senator Henry Poppen, RR 1, Box 77, DeSmet SD 57231  
Representative Dean Anderson, RR 1, Box 104, Bryant SD 57221  
Representative Joyce Hodges, RR 1, Box 74, Lake Preston SD 57249

Karen Schlaak

KAREN SCHLAAK  
Senior Secretary

STATE OF SOUTH DAKOTA )  
 ) SS  
COUNTY OF HUGHES )

Sworn to, before me, this 10<sup>th</sup> day of November, 1988.



*John H. Bates*  
Notary Public

September 23, 1988  
(date)

page 1

Parties of Record before Water Management Board regarding Water Permit  
Application No. 5208-3, Kingbrook Rural Water System

For:

Against:

Larry Sterling  
Kingbrook Rural Water System  
Drawer 299  
Arlington SD 57212

Mary Lois and Marvin Ogren  
RR 1, Box 111  
DeSmet SD 57231

Morris Elcock, Manager  
Kingbrook Rural Water System  
Drawer 299  
Arlington SD 57212

Neil Rommerein  
RR 1, Box 97  
DeSmet SD 57231



# Department of Water & Natural Resources

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

December 15, 1988

## NOTICE

TO: Parties of Record to Water Permit Application No. 5208-3, Kingbrook Rural Water System

FROM: John Hatch, Chief Engineer  
Water Rights Division  
605 773-3352 

SUBJECT: Preparation of Findings of Fact, Conclusions of Law and Final Decision

The Water Management Board has directed John Guhin, the Board's attorney to prepare proposed Findings of Fact, Conclusions of Law and a Final Decision on Approval of Water Permit Application No. 5208-3, Kingbrook Rural Water System. The Board will consider the proposed Findings, Conclusions and Final Decision at 1:00 pm. March 1, 1989 in the Roosevelt Room, Howard Johnsons, 2211 LaCrosse, Rapid City SD. The agenda time is an estimate. The actual time of consideration may be delayed due to prior agenda items.

The Board has requested that a copy of the proposed Findings, Conclusions and Final Decision be mailed to each Board member and all Parties of Record and their attorneys (copy enclosed) by February 9, 1989. Any comments pertaining to the proposed Findings, Conclusions and Decision are to be mailed to each Board member, the Board attorney and all Parties of Record and their attorneys by February 17, 1989.

The public hearing on Water Permit No. 5208-3 was completed December 7, 1988. No additional testimony on this application will be received on March 1, 1989.

enclosure



## CERTIFICATION

I hereby certify that on December 15, 1988 I have personally deposited with the U.S. Mail postage prepaid envelopes containing NOTICE on Preparation of Findings of Fact, Conclusions of Law and Final Decision on Water Permit Application No. 5208-3 to those persons on the Parties of Record sheet.

*Karen Schlaak*  
KAREN SCHLAACK  
Senior Secretary

STATE OF SOUTH DAKOTA )  
 ) SS  
COUNTY OF HUGHES )

Sworn to, before me, this 16<sup>th</sup> day of December, 1988.



*John L. Latham*  
Notary Public



*Ch.*

DeWild Grant Reckert and Associates Company  
Consulting Engineers

315 First Avenue  
Rock Rapids, Iowa 51246  
(712) 472-2531

March 14, 1989

Department of Water and Natural Resources  
Joe Foss Building  
Pierre, SD 57501-3181

Attn: Raymond Birchem *RTB*

Re: Kingbrook Rural Water System  
DeSmet Water Plant Improvements  
DGR File No. 3729

Dear Raymond:

We are forwarding under separate cover one (1) copy of the Plans and Specifications for the above referenced project for your review. Please feel free to call me with any questions or comments you may have.

Very truly yours,

DEWILD GRANT RECKERT  
& ASSOCIATES COMPANY

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

GJP:kld

Enclosures

cc: Kingbrook RWS

**DEWILD**

*J. Hatch*

**DeWild Grant Reckert and Associates Company**  
Consulting Engineers

315 First Avenue  
Rock Rapids, Iowa 51246  
(712) 472-2531

DATE: March 15, 1989

PROJECT: DeSmet Well Field Improvements  
Kingbrook Rural Water System  
Arlington, South Dakota

LETTING: March 20, -1989, 3:00 P.M.  
Kingbrook Rural Water System Office  
101 West Elm  
Arlington, South Dakota

---

ADDENDUM NO. 1

This Addendum No. 1 hereby revises the Contract Documents dated March 3, 1989. Revisions made herein shall become a binding part of the Contract Documents.

1. Section 11932, page 11-5.

Delete subparagraph 2.02.A.7.

2. Section 11932, page 11-8.

In subparagraph 2.03.B.1.h., change drop pipe diameter to 4-inch.

3. Sheet No. 2 of the Drawings.

In the Yard Piping Detail, centerline elevation of the 12-inch piping in the area of the flushing hydrant shall be 20.0' to maintain a minimum pipe cover of 5'.

This ADDENDUM NO. 1 shall become a legal and binding part of the Contract Documents. All BIDDERS shall acknowledge receipt of this ADDENDUM No. 1 on the BID and agree to accept the revisions indicated and prepare proposals in accordance therewith.

DEWILD GRANT RECKERT  
& ASSOCIATES COMPANY

By

*Gary Patton*  
Gary Patton, P.E., South Dakota Reg. #3612

GP:kld

0373902A.GEN



DeWild Grant Reckert and Associates Company  
Consulting Engineers

315 First Avenue  
Rock Rapids, Iowa 51246  
(712) 472-2531

MEMO TO: Planholders  
DeSmet Well Field Improvements  
Kingbrook Rural Water System

FROM: Gary Patton

DATE: March 15, 1989

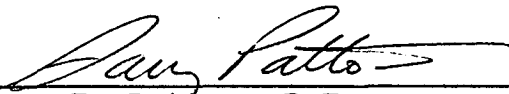
RE: Information and Data Relative to Naturally Occurring  
Subsurface Physical Conditions

---

During the exploratory test drilling phase of DeSmet Well No. 4 construction, the Engineer relied upon the logs of test holes drilled by the South Dakota Geological Survey (S.D.G.S.) and by L.T.P. Enterprises of Fargo, ND. Attached is a copy of test hole logs in the vicinity of Well No. 4 and a map showing the test hole locations. The base map was prepared by the S.D.G.S.

The above referenced information was obtained solely for the purpose of locating the preferred site for Well No. 4. Because the Owner and Engineer have no control over the methods used for obtaining, evaluating or recording subsurface information, and because the area sampled during subsurface investigation is small in comparison to the project area, and for other reasons, the Owner and Engineer shall not be responsible for the accuracy or completeness of subsurface information or data, or for any interpretation of such information by the Contractor. Subsurface information or data referenced herein are not a part of the Contract Documents.

DEWILD GRANT RECKERT  
& ASSOCIATES COMPANY

By   
Gary J. Patton, P.E.

GJP:kld

ATTACHMENT TO MEMO DATED 3/15/89  
DeSmet Well Field Improvements  
Kingbrook Rural Water System

| <u>LTP Test<br/>Hole No.</u> | <u>Driller's Log</u>                          | <u>Depth to<br/>Static Water<br/>Level</u> |
|------------------------------|-----------------------------------------------|--------------------------------------------|
| 1.                           | 0-3' topsoil<br>3'-51½ gravel<br>51½-62' clay | 12.4'                                      |
| 2.                           | 0-3' topsoil<br>3'-54' gravel                 | 13.5'                                      |
| 3.                           | 0-3' topsoil<br>3'-58' gravel                 | 11.8'                                      |

SDGS Test  
Hole No.

|     |         |                                                                                                                                                                          |
|-----|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20. | 0-3'    | topsoil, black, oxidized, organic                                                                                                                                        |
|     | 3'-20'  | gravel, reddish-yellow, cobbles to boulders (?), pebbly, sandy, poorly sorted; oxidized, calcareous matrix, E-log indicates possible finer stringers                     |
|     | 20'-30' | Gravel and sand, reddish-yellow, cobble to pebble-sized gravel, fine to coarse sand, poorly sorted; oxidized calcareous matrix, E-log indicates possible finer stringers |
|     | 30'-62' | Gravel and sand, reddish-yellow, fine to coarse gravel, fine to coarse sand, poorly sorted; oxidized, calcareous matrix, E-log indicates possible finer stringers        |
|     | 62'-77' | Clay, gray, silty, sandy, pebbly; unoxidized, calcareous (till)                                                                                                          |
| 23. | 0-5'    | Topsoil, black; oxidized, organic                                                                                                                                        |
|     | 5'-28'  | Gravel and sand, reddish-yellow, coarse gravel with cobbles and boulders (?), medium to coarse sand, poorly sorted; oxidized, calcareous matrix, manganese staining      |
|     | 28'-31' | Silt, gray, slightly sandy and pebbly; coal fragments; unoxidized, calcareous                                                                                            |
|     | 31'-46' | Gravel, grayish, coarse to fine, sandy, poorly sorted; unoxidized, calcareous matrix                                                                                     |

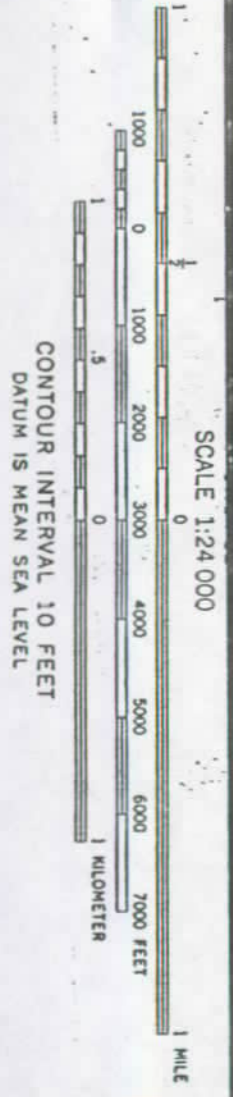
46'-48' Silt, gray, clayey, slightly sandy;  
unoxidized, calcareous  
48'-59' Gravel, grayish, coarse to fine,  
sandy; unoxidized, calcareous  
matrix  
59'-67' Clay, gray, very silty, sandy,  
pebbly; unoxidized, calcareous  
(till)

This report and/or map is preliminary and has not been edited or reviewed for conformity with State Geological Survey standards or nomenclature.



WATER TABLE ELEVATION MAP OF THE  
VERMILLION EAST FORK AQUIFER IN  
THE SPIRIT LAKE - DE SMET AREA.

- well
- ☆ Kingbrook RWS production well
- 1705.5 ground water elevation from surveyed well
- 1700.6T ground water elevation from topographic approximation
- - - 1705 contour of water level, dashed where approximate, ? in areas of limited data
- - - 10 - 10 - foot contour from saturated thickness map (rough outline of areal extent for the Vermillion East Fork Aquifer) dashed where approximate, ? in areas of limited data



**SOUTH Dakota** Department of  
**Water & Natural Resources**

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

March 23, 1989

**NOTICE**

TO: Parties of Record to Water Permit Application No.  
5208-3, Kingbrook Rural Water System

FROM: John Hatch, Chief Engineer  
Water Rights Division  
605 773-3352 *John Hatch*

SUBJECT: Adoption of Findings of Fact, Conclusions of Law and  
Final Decision

This is to notify you that a Final Decision, including Findings of Fact, Conclusions of Law were adopted by the Water Management Board for Approval of Water Permit Application No. 5208-3 which was considered at the December 7, 1988 meeting.

A copy of the signed final Decision, Findings and Conclusion is enclosed for the applicant. Copies will be furnished to anyone else upon request. South Dakota Statutes provide that the decision of the Board may be appealed to the Courts.



## CERTIFICATION

I hereby certify that on March 23, 1989 I have personally deposited with the U.S. Mail postage prepaid envelopes containing a Notice on Adoption of Findings of Fact, Conclusions of Law and Final Decision on Future Use Permit Application No 5208-3 addressed to those persons listed on the Parties of Record sheet.

*Karen Schlaak*  
KAREN SCHLAACK  
Senior Secretary

STATE OF SOUTH DAKOTA )  
 ) SS  
COUNTY OF HUGHES )

Sworn to, before me, this 24th day of March, 1989.



*John H. H. H.*  
Notary Public

STATE OF SOUTH DAKOTA

BEFORE THE WATER MANAGEMENT BOARD

IN THE MATTER OF THE )  
APPLICATION FOR WATER PERMIT )  
NO. 5208-3 AND AMENDMENT OF )  
WATER PERMITS NO. 4137-3 AND )  
5182-3 FOR KINGBROOK RURAL )  
WATER SYSTEM )

FINDINGS OF FACT,  
CONCLUSIONS OF LAW AND  
FINAL DECISION

FINDINGS OF FACT

1. This is an application for 1.4 c.f.s. from two wells, approximately 50 feet deep, in the Vermillion East Fork aquifer. The proposed use of the water is in the Kingbrook Rural Water System.

2. The Vermillion East Fork is a Pliestocene outwash aquifer generally under water table conditions. The aquifer underlies 94 square miles and averages about 25 feet in saturated thickness in Kingsbury County. The aquifer contains approximately 300,000 acre feet of water in storage.

3. Kingbrook Rural Water System seeks water under Permit No. 5208-3 to supply water to Oldham and Howard. Until quite recently, Oldham utilized water with excessive levels of fluoride; Oldham was compelled by EPA to seek water from another source. Oldham is presently on the Kingbrook System and Kingbrook finds it necessary to increase its capacity to reliably serve Oldham. The city of Howard now draws water from two wells that are high in radium and from one additional well which supplies dilution water. The third well, however, shows serious signs of

depletion. Howard is in the process of putting together a contract with the Kingbrook Rural Water System to supply water to it. In consequence of these two new uses, Kingbrook has shown a substantial need for additional water.

4. There is an average rate of recharge of the aquifer of about four inches per year throughout the aquifer. This equates to about 20,000 acre feet per year of recharge.

5. The main stress on the aquifer is, however, restricted to about one-half of the aquifer. It is this half of the aquifer in which the present application is made.

6. A movement of water from one part of the Vermillion East Fork aquifer to the remainder of the aquifer is probably limited; it is therefore appropriate to consider recharge and withdrawals from only that half of the aquifer.

7. Recharge in the critical part of the aquifer is about 10,000 acre feet per year.

8. Withdrawals from the critical half of the aquifer do not exceed 300 acre feet for DeSmet, 360 feet for the Kingbrook Rural Water System, and 2,500 acre feet for the 25 or so irrigators in the area. This is a total of approximately 3,160 acre feet consumptive use annually at a maximum.

9. The city of DeSmet has 1,810 additional acre feet tied up in a future use permit.

10. The total of the DeSmet future use permit and the existing uses is 4,970 acre feet. The total amount of recharge is 10,000 acre feet in the critical area.

11. Kingbrook Rural Water System presently holds water rights for 4137-3 and 5186-3, which have a combined diversion rate of 1.7 c.f.s.

12. Kingbrook Rural Water System has a demonstrated need for an additional diversion rate of 1.4 c.f.s. The volume of water necessary to meet the immediate demands of Kingbrook Rural Water System is, however, less than the combined diversion rate of 3.1 c.f.s. under permits 5208-3, 4137-3, and 5186-3. It is appropriate to limit the volume withdrawal from the proposed permit and the two existing permits to 60 percent of the amount which could be withdrawn if 24 hour pumping were allowed at the total diversion rate for all three permits.

13. The maximum pumping which should be allowed to the three permits therefore should be set at 1,350 acre feet per year.

14. Use of the 60 percent figure allows the withdrawal of water during low use periods such as the nighttime and in wet periods. Moreover, use of the 60 percent figure more closely represents actual pumping goals and needs of Kingbrook Rural Water System.

15. The large number of wells in the areas justifies at least a 660 feet spacing requirement.

16. The published notice of hearing for Applications 5208-3 and 5209-3 was joined. It was appropriate to join the notice of hearings since they are so closely interrelated. Application 5208-3 is for 1.4 c.f.s. for the Kingbrook System; Application 5209-3 is for a future use permit for Kingbrook System. The same source of water is stated in each permit.

17. The hydrographs done of several wells in the area indicate that pumping by one user will not have an appreciable affect on other users. This same thesis is borne out by the effect of water table conditions within the area.

18. The grant of Water Permit 5208-3 will not, in and of itself, prevent all future irrigation development in the area, although it may preclude some use.

19. There is a possibility that persons have purchased land under the assumption that they would be able to irrigate such land in the future. These persons have not, however, applied for water permits.

#### CONCLUSIONS OF LAW

1. This Board has jurisdiction of the matter.

2. There is a reasonable probability that there is unappropriated water available for the Applicant's proposed use.

3. The proposed use for the Kingbrook Rural Water System is a beneficial use.

4. The proposed diversion can be developed without unlawful impairment of any existing water right.

5. The proposed use in the rural water system is in the public interest when weighed against the potential use by irrigators who have not yet applied for permits and when qualified as set out in the Final Decision.

#### FINAL DECISION

The application for Water Permit 5208-3 is approved with the following qualifications:

1. Wells authorized by Permit No. 5208-3 shall be spaced at least 660 feet apart and at least 660 feet from other wells.

2. The casings of the wells to be constructed under Permit No. 5208-3 shall be pressure grouted with cement (bottom to top) from the producing formation to the surface and the well constructed in compliance with Water Management Board Well Construction Rules, Chapter 74:02:04.

3. 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.

4. The Kingbrook Rural Water System shall report to the chief engineer annually the amount of water withdrawn each year from the Vermillion East Fork aquifer.

5. Approval of Permit No. 5208-3 authorizes maximum combined annual withdrawals under Permits No. 4137-3, 5186-3, and 5208-3 of up to 1,350 acre feet.

6. Permits No. 4137-3 and 5186-3 are herewith amended consistent with this Final Decision.

Dated and signed this 22 day of May, 1989.

BY THE BOARD:

Marian B. Gunderson  
(Signature)

 **Department of  
Water & Natural Resources**

Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3181

SEP 12 1989

Larry Sterling  
Kingbrook Rural Water System  
Drawer 299  
Arlington SD 57212

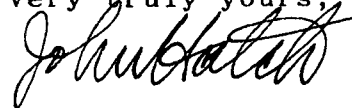
Dear Mr. Sterling:

Enclosed is Water Permit No. 5208-3 as approved by the Water Management Board authorizing you to construct your water diversion system and put the water to beneficial use, not exceeding the limits as specified in the Water Permit.

Also enclosed is Form 10, Notice of Completion of Works and Application of Water to Beneficial Use, which you are to complete and submit to the Chief Engineer when you have completed the system and/or have put the water to beneficial use. An inspection can then be scheduled so that the Water License may be issued, thus completing your acquisition of a Water Right.

Enclosed are copies of Amendments of Permit Nos. 4137-3 and 5186-3 which should be placed with each of those permits.

Very truly yours,



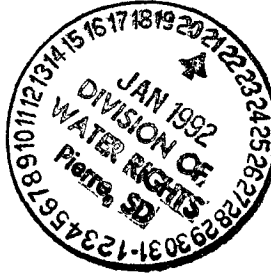
JOHN HATCH, Chief Engineer  
Water Rights Division  
605 773-3352

enclosures

**PLEASE NOTE:** Certain changes can be made in your permit within the five year construction period, usually without affecting the priority date provided an application to amend your permit is made within the five year period - i.e. changes in location or number of diversion points (wells) or location of land to be irrigated. Well locations for wells into the same aquifer can be moved up to 660 feet without application.

Applications to amend a permit after the five year construction period will be assigned a new priority date. Applications to change water sources, to add lands or increase original diversion rates, if approved will usually receive the date of the new application as a priority date regardless of the five year construction period.





**DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES**

JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE SOUTH DAKOTA 57501-3181

January 7, 1992

Kingbrook Rural Water System  
Larry Sterling  
Drawer 299  
Arlington SD 57212

Dear Mr. Sterling:

Pursuant to a qualification on Water Permit/Right No(s). 5208-3 (Vermillion East Fork Aquifer), we are requesting that the Kingbrook Rural Water System report to the Chief Engineer the amount of water withdrawn for the year 1991. Please respond by February 10, 1992.

If you have any questions concerning this or other water rights questions, please contact Don Frye, Natural Resources Analyst, (605) 773-3352.

Very truly yours,

Ron Duvall,  
Natural Resources Engineer  
for JOHN HATCH, Chief Engineer  
Water Rights Division

For the year 1991-151,145,000 gallons of water has been withdrawn from the above referenced aquifer.

*Jolene King / Bookkeeper*

*1-17-92*

**KINGBROOK  
RURAL WATER SYSTEM**



5208-3



January 7, 1993

Drawer 299

ARLINGTON, S. DAKOTA 57212

Telephone (605) 983-5074

Barry McLaury, Natural Resources Analyst  
Joe Foss Building  
523 East Capitol  
Pierre, SD 57501-3181

Dear Mr. McLaury:

Enclosed find the information requested on December 23, 1992 for water diverted under the permit(s) during 1992.

Permit #4137-3 is for wells #1, #2 and #3 Phase II  
gallons pumped for 1992 - 2,299,800 gallons

Permit #5186-3 is for well #4 Phase II  
gallons pumped for 1992 - 61,005,000 gallons

Permit #5426-3 is for wells #5 and #6 Phase II  
gallons pumped for 1992 - 118,335,000 gallons

Permit #5208-3 was changed to Permit #5208A-3 which was a change of diversion and is for wells #7 and #8 which have not been constructed yet.

Permit 5209-3 is a future use permit for Phase II

---

Permit #4367-3 is for well #1 and #2 for the Phase III plant  
gallons pumped with these two wells total 139,980,000 gallons.

Permit #5646-3 is for well #3 in Phase III and is set for construction during early 1993.

Permit #5643-3 is a future use permit for Phase III

If you have any questions, please give me a call.

Sincerely,

*Morris Elcock*

Morris Elcock  
Manager

ME/jk



5208-3

**DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES**

JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE SOUTH DAKOTA 57501-3181

January 13, 1994

Larry Sterling  
Kingbrook Rural Water System  
Drawer 299  
Arlington, SD 57212

Dear Mr. Sterling:

Pursuant to a qualification on Water Permit/Right Nos. 5785-3, 5208-3, 5208A-3, 5186-3, 4137-3, 5426-3 (Vermillion East Fork Aquifer) & 5646-3 (Big Sioux:Northern Skunk Creek Aquifer), I am requesting that the Kingbrook Rural Water System report the total amount of water diverted from the Vermillion East Fork Aquifer and the Big Sioux:Northern Skunk Creek Aquifer during 1993. Please respond by January 31, 1994.

If you have any questions concerning this or other water rights questions, please contact Barry McLaury, Natural Resources Analyst, (605) 773-3352.

Sincerely,

RON DUVALL, Natural Resources Engineer  
for JOHN HATCH, Chief Engineer  
Water Rights Division

Vermillion EFA = 221,910,000 gal.  
Big Sioux = 140,064,000 gal.



**DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES**

JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE, SOUTH DAKOTA 57501-3181

December 15, 1995

Morris Elcock, Manager  
Kingbrook Rural Water System  
Drawer 299  
Arlington SD 57212

Dear Mr. Elcock:

I am writing in response to your December 14, 1995, request for a summary of your water permits. Attached is a listing dated December 15, 1995, of the requested permits.

The listing of permits is grouped by aquifer: BS-NSC (Big Sioux-Northern Skunk Creek aquifer); VEF (Vermillion East Fork aquifer); BS-B (Big Sioux-Brookings aquifer.) The amount of water appropriated in CFS (cubic feet of water per second), AF (acre-feet of water), priority date, diversion point location, and status (PE - permit, LC - licensed, and FU - future use) is listed for each permit. Any water permit with a "PE" status will eventually be licensed following completion of an on-site investigation.

A couple points to consider when reviewing this list:

- The "CFS" listed for "PE" status permits will be reduced upon licensing if the actual diversion rate is less than the specified rate, and
- The "AF" listed for each future use permit is the number of acre-feet remaining in reserve.

Please let me know if you need any further assistance (605) 773-3352. Have a Merry Christmas!

Sincerely,

Ron Duvall  
Natural Resources Engineer  
Water Rights Program

enclosure

| PERMIT                                                                                                             | NAME                      | CFS  | AF  | PRIORITY                 | DIV. PT. LOCATION                                                                                                                             | AQUIFER | STATUS |
|--------------------------------------------------------------------------------------------------------------------|---------------------------|------|-----|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------|--------|
| 4367-3                                                                                                             | KINGBROOK RWS             | 3.00 | *   | 1979-01-09               | SE $\frac{1}{4}$ NE $\frac{1}{4}$ 8-105N-51W<br>NE $\frac{1}{4}$ NE $\frac{1}{4}$ 17-105N-51W                                                 | BS-NSC  | PE     |
| 5646-3                                                                                                             | KINGBROOK RURAL WATER SYS | 1.00 | 425 | 1992-03-19               | NW $\frac{1}{4}$ SW $\frac{1}{4}$ 9-105N-51W                                                                                                  | BS-NSC  | PE     |
| *No acre-foot limitation specified on Permit No. 4367-3                                                            |                           |      |     |                          |                                                                                                                                               |         |        |
| 5643-3                                                                                                             | KINGBROOK RWS, INC        |      | 425 | 1992-03-19               | Portions of sections 8, 9,<br>17; all in 105N-51W                                                                                             | BS-NSC  | FU     |
| 4137-3                                                                                                             | KINGBROOK RWS INC         | 1.06 | *   | 1977-03-04               | SW $\frac{1}{4}$ SE $\frac{1}{4}$ 8-111N-56W<br>SE $\frac{1}{4}$ NE $\frac{1}{4}$ 8-111N-56W<br>SE $\frac{1}{4}$ NE $\frac{1}{4}$ 17-111N-56W | VEF     | LC     |
| 5186-3                                                                                                             | KINGBROOK RWS INC         | 0.70 | *   | 1988-03-29               | SW $\frac{1}{4}$ SW $\frac{1}{4}$ 16-111N-56W                                                                                                 | VEF     | LC     |
| 5208-3                                                                                                             | KINGBROOK RWS             | 1.40 | *   | 1988-08-15               | 5208A-3 changes location<br>of diversion points                                                                                               | VEF     | PE     |
| 5208A-3                                                                                                            | KINGBROOK RURAL WATER SYS |      | *   | 1988-08-15               | E $\frac{1}{2}$ NW $\frac{1}{4}$ , SW $\frac{1}{4}$ NE $\frac{1}{4}$<br>6-111N-56W                                                            | VEF     | PE     |
| 5426-3                                                                                                             | KINGBROOK RWS             | 1.40 | *   | 1988-08-15               | SE $\frac{1}{4}$ NW $\frac{1}{4}$ , NW $\frac{1}{4}$ NW $\frac{1}{4}$<br>6-111N-56W                                                           | VEF     | LC     |
| 5785-3                                                                                                             | KINGBROOK RWS, INC.       |      | *   | 1993-08-25               |                                                                                                                                               | VEF     | PE     |
| *Combined diversions under all permits in the Vermillion East Fork aquifer may not exceed 1,350 acre-feet annually |                           |      |     |                          |                                                                                                                                               |         |        |
| 5209-3                                                                                                             | KINGBROOK RWS             |      | 550 | 1988-08-15               | Portions of sections 10 &<br>8, 6; all in 111N-56W                                                                                            | VEF     | FU     |
| 5079-3                                                                                                             | BROOKINGS-DEUEL-KINGBROOK | 2.90 | *   | 1975-05-05<br>1977-06-06 | NE $\frac{1}{4}$ 24; NE $\frac{1}{4}$ NE $\frac{1}{4}$ 25;<br>112N-51W; NW $\frac{1}{4}$ SW $\frac{1}{4}$<br>19-112N-50W                      | BS-B    | LC     |
| 2612A-3                                                                                                            | BROOKINGS-DEUEL-KINGBROOK | 0.89 | 210 | 1976-03-01               | NW $\frac{1}{4}$ NE $\frac{1}{4}$ 25-112N-51W                                                                                                 | BS-B    | LC     |
| 5434-3                                                                                                             | BROOKINGS-DEUEL-KINGBROOK |      | 224 | 1990-04-02               | Same as 2612A-3                                                                                                                               | BS-B    | PE     |
| 5602-3                                                                                                             | BROOKINGS-DEUEL-KINGBROOK | 1.00 | 434 | 1977-06-06               | NE $\frac{1}{4}$ NE $\frac{1}{4}$ 25-112N-51W                                                                                                 | BS-B    | PE     |
| 5821-3                                                                                                             | BROOKINGS-DEUEL-KINGBROOK |      |     | 1994-05-05               | Connect City of Arlington                                                                                                                     | BS-B    | PE     |
| *No acre-foot limitation specified on Permit No. 5079-3                                                            |                           |      |     |                          |                                                                                                                                               |         |        |
| 3982-3                                                                                                             | BROOKINGS-DEUEL-KINGBROOK |      | 869 | 1977-06-06               | Parts of 24,25-112N-51W<br>and 19-112N-50W                                                                                                    | BS-B    | FU     |
| 3982A-3                                                                                                            | BROOKINGS-DEUEL-KINGBROOK |      |     | 1994-01-10               | Added all SW $\frac{1}{4}$ sec 19                                                                                                             | BS-B    | FU     |

December 15, 1995



**DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES**

JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE, SOUTH DAKOTA 57501-3181  
[www.state.sd.us/denr](http://www.state.sd.us/denr)

SEP 8 1998

5785-3

Randy Jencks, General Manager  
Kingbrook Rural Water System, Inc.  
Drawer 299  
Arlington, SD 57212

Dear Mr. Jencks:

Enclosed is Water License No. 5785-3. This is the final water right document completing your process of obtaining a Water Right. Enclosed is Receipt No. 415717 in the amount of \$50.00 which you paid for the investigation and issuance of the Water License.

For your information SDCL 46-6-27 requires that if the owner of an existing well, such as the well authorized by Water Right No. 5785-3, constructs a replacement well and does not plan to use the old well, the old well is considered abandoned and must be plugged. Also, any well that is being used or is not considered abandoned must be valved and controlled, if flowing, or sealed and capped so that no leaking occurs either underground or at the surface.

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

Very truly yours,

JOHN HATCH, Chief Engineer  
Water Rights Program  
(605) 773-3352

ks  
enclosures

**NOTE: The applicable portions of Nos. 5208-3 and 5208A-3 are incorporated into No. 5785-3.**