

Water Right Number 4367-3

1. Considered January 31, 19 79
2. Name of Applicant King's Creek Rural Water System
3. Post Office Address Dr. Arnet, SD. 8/17-105-51
4. Amount of water claimed 3.0
5. Source of water supply 1-68' well and 1-66' well
6. Water to be used for Rural Water System

Acres to be irrigated —

7. Water to be diverted and used in Lake County
about ZW, IN 4, 1 1/2 N Miles — of CHESTER

8. Proof of Publication

Received ^{1st} 1-29-79

Not received —

9. Application

Approved —

Subject to —

Not approved —

Action deferred —

10. Remarks:

*Copy to be noted by Commissioners
no additional as 4368-3 should
be 4367-3.*

No. 4367-3Map No. 3564-3 Water Division No. 3 BIG SIOUX RIVER District _____
(Blanks to be Filled by the Engineer for the W. R. C.)

APPLICATION FOR PERMIT

To Appropriate Water within the State of South Dakota

(NOTE-Draw a line through items not applicable)

1. Name of Applicant Alec Vedvei, Chairman, Kingbrook Rural Water System, Inc.
 Postoffice address P.O. Box E, DeSmet, State South Dakota 57231
 If a corporation show date and place of incorporation 1/10/75, Arlington, So. Dak., Amended 4/20/76
2. Method of accomplishing work (contract, employment of others, or by direct labor) Contract
3. Name of diversion work Kingbrook Rural Water System Well Field No. 2
4. Amount of water claimed (cubic feet per second) #1@1.5 cfs, #2@1.5 cfs, = 3.0 cfs total
5. Source of water supply Ground water
6. Location of point of diversion Well No. 1-SE $\frac{1}{4}$ of NE $\frac{1}{4}$ of Section 8, T105N, R51W.
Well No. 2-NE $\frac{1}{4}$ of NE $\frac{1}{4}$ of Section 17, T105N, R51W.

County Lake

7. Annual period or periods during which water is to be used Continuous
8. Use to be made of water, (irrigation, industrial, municipal, commercial, recreation, etc.) Domestic Consumption
9. For irrigation use, Total number of acres to be irrigated None

List below each forty acre subdivision, or lot, or fraction thereof and show number of acres to be irrigated in each.

Land Description	No. Acres Irr.	Land Description	No. Acres Irr.

Attach sheet if more space is needed

10. Time required to complete construction of water supply system three years. Additional time required to complete application of water to the proposed beneficial use one years.
11. Choice of newspaper for Notice of Intent to Appropriate Water publication Madison Daily Leader
12. Principal Features of the Proposed Water Supply System.

A. Works proposed to divert water from its natural source.

Two water supply wells.

B. Works proposed to transport water to place of use.

High service pumps, underground piping distribution system

C. Works proposed to apply water to beneficial use.

Estimated Total Cost \$ 4,000,000.00

Attachments: Attach Form 2A if diversion from a well or dugout, or if storage of water, is proposed. Attach map.
 (See instructions concerning preparation.)

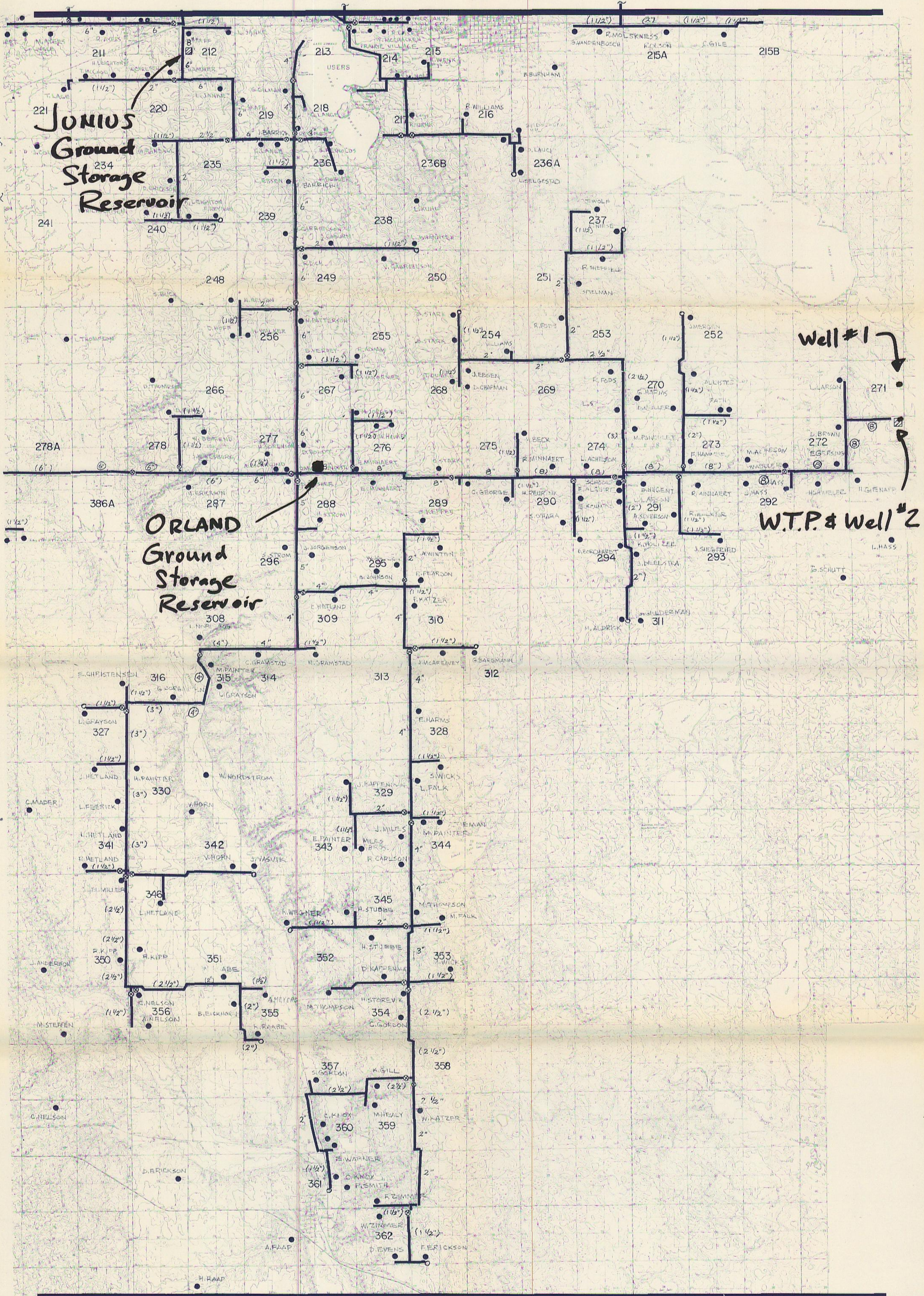
STATE OF SOUTH DAKOTA)

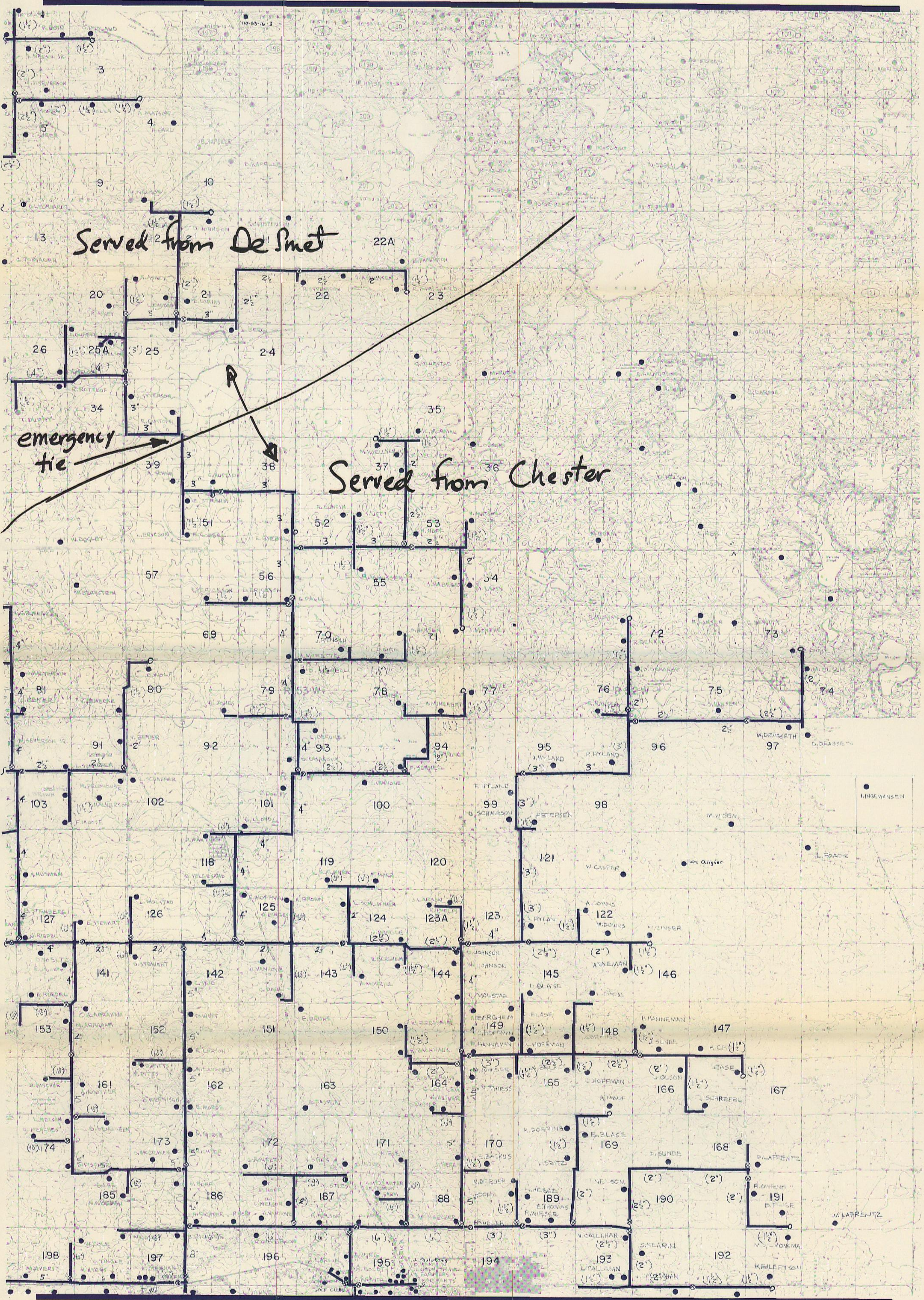
County of Kingsbury)

I, Alec Vedvei the applicant, certify that I have read the foregoing application and have examined the attached map and that the matters therein stated are true and that I intend, and am able to complete the necessary construction.

Signed Alec VedveiSubscribed and sworn to before me this 8th day of February, 1979

Notary Public (or other qualified officer)





4-1
3-2

Sheet
Rapid Number

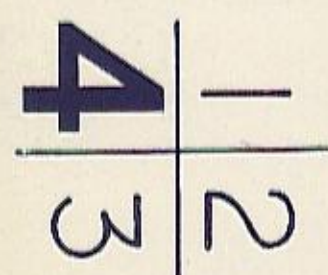


DeWild Grant Reckert & Associates Co.
Architecture Engineering Planning
Rock Rapids, Iowa
Sioux City, Iowa
Sioux Falls, South Dakota

Date
Drawn By
Approved
Revised

DISTRIBUTION SYSTEM
LOCATION PLAN
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 _____ and that I am competent to prepare this document
Registration No. _____ Date _____
By _____

PHASE 3
KINGBROOK
RURAL WATER SYSTEM
ARLINGTON, SOUTH DAKOTA



LAKE PRESTON
Ground Storage
Reservoir
(receives water
from DeSmet
Ph. 2 W.T.P.)

Oldham

emergency
tie

Served from
De Smet

emergency
tie

Served from
Chester

4
1
3
2

Sheet
Project Number



DeWild Grant Reckert & Associates Co.
Architecture Engineering Planning

Date
Drawn By
Approved
Revised

Rock Rapids, Iowa
Sioux City, Iowa
Sioux Falls, South Dakota

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 _____ and that I am competent to prepare this document
Registration No. _____ Date _____
By _____

WATER RIGHT APPLICATION APPROVAL

The Water Resources Commission hereby approves Water Right Application No. 4367-3
KINGBROOK RURAL WATER SYSTEM - BOX E, DE SMET
 (Applicant) (Post Office Address)
SOUTH DAKOTA 57231 With the following modifications:
 (State)

The wells approved under this Permit will be located near domestic wells and other irrigation 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 ~~irrigation~~ ^{OTHER} wells having prior water rights.

Date of first receipt of application JANUARY 9 19 79
 Date of return to applicant for correction, amendments or changes required _____ 19 ____
 Date of receipt of corrected application _____ 19 ____
 Approved JANUARY 31 19 79 Recorded in Book 20 Page 110

WATER RIGHT PERMIT NO. 4367-3

The Water Resources Commission hereby grants and issues this Water Right Permit No. 4367-3 authorizing the construction of the water use system and the putting of water to beneficial use as stated in the Application and as modified in the Water Right Application approval, subject, however, to the following limitations and conditions:

1. The date from which applicant may claim right is JANUARY 9 19 79
2. The equivalent of at least one-fifth of the work above specified is to be completed on or before JULY 31 19 80
3. The whole of said work is to be completed on or before JANUARY 31 19 82
4. The limit of time from proof of beneficial use of water appropriated in accordance herewith is JANUARY 31 19 83
5. The water appropriated shall be used for the purpose of DOMESTIC USE - RURAL WATER SYSTEM
6. The prior right of all persons who, by compliance with the laws of the State of South Dakota, have acquired a right to the use of water must not be injuriously affected by this appropriation.
7. The amount of the appropriation herein granted shall not exceed 3.0 cubic feet per second; neither shall it exceed the capacity of the above described water supply system, nor shall it exceed the amount of water needed for ~~beneficial use~~ ^{used for rural water system} and if for the irrigation purposes said appropriation must be limited to not more than 3 acre feet per acre per year and be limited to not more than one-seventieth (1/70) of one cubic foot of water per second of time for each acre of land to which water is actually and beneficially ~~applied for irrigation~~ ^{used for rural water system} on or before JANUARY 31 19 83; said water to be used during the following described annual period: CONTINUOUSLY

Witness my hand this 20th day of June 19 79

WATER RESOURCES COMMISSION

By:

John Hatch
 Chief Engineer, Executive Officer

Certificate of Construction Issued _____ 19 ____

Water License Issued _____ 19 ____

GRIMSHAW DRILLING CO.

**DRIILLING
LOG**

924 South Melrose
Sioux Falls, S.D. 57106
Phone 605-332-6974

MELL #0

Name Kingbrook Rural Waters Date 11-2-98
Address Phase 3

Address _____
County _____

NO. FT.	DIA.	RATE	CASING	TOTAL
50'	4 3/4"	56.00	2"	56.00 300.00
16'	4 3/4"	64.00	2"	64.00
14'	4 3/4"	33.00	Drilling	33.00
Job	Casack +	Underwood	Ind	
BALANCE DUE:				540.00

0 ft. to 2 ft. Topsoil

[illegible]

REMARKS:

REMARKS: 2 1/2 bags of benonite used - we flooded with clean water & blew with air gun

12. Principal Features of the Proposed Water Supply System (continued.)

D. Well Information or Estimates

- (1) Drill Hole, Diameter 30 Inch, Depth #1 @ 68', #2 @ 66'
- (2) Casing, Type Steel Diameter 16 Inch Thickness 0.375 Inch
(wood, concrete, steel, etc)
- (3) Perforated Screen.
Type Stainless Steel, Diameter 16 Inch, Length 10 Feet each
- (4) Gravel Pack. Thickness 7 Inches, Length of gravel pack 20 Feet each

E. Dugout Information or Estimates.

- (1) Surface dimensions N.A., Depth N.A.

F. Fill out for Either a Well or a Dugout.

- (1) Water Bearing Materials. (Please attach a copy to test well log if available.)

Character of Water bearing materials fine to medium grey sand

Depth to top of water bearing material #1 @ 47', #2 @ 42'

Depth to bottom of water bearing material #1 @ 68', #2 @ 66'

Thickness of water bearing material #1 @ 21', #2 @ 24'

Depth to water (ground surface to water level) #1 @ 25', #2 @ 18'

- (2) Distance to nearest existing household or livestock watering wells.

On same owner's property #1-109 #2-N.A. rds. On property owned by others #1-158 #2- 91 rds.

G. Water Storage Dams.

If the proposed water use system contains one or more water storage dams, please show in the space below, the height, maximum water depth, surface area and storage capacity of each storage dam. The location of each water storage dam should be shown on the water right map.

Alex V. Dineen
Signature of Applicant

No. 4367-3

Publish first publication, on or before January 19, 1979

NOTICE OF HEARING ON
APPLICATION TO APPROPRIATE WATER

Pierre, South Dakota 57501

January 15, 1979

Notice is hereby given that the Kingbrook Rural Water System, Inc. whose post office address is De Smet, South Dakota, has made an application in accordance with the provisions of SDCL 46-1-1 thru 46-1-9, 46-1-14; 46-2-9 thru 46-2-11, 46-2-13; 46-5-1 thru 46-5-8; 46-5-10 thru 46-5-22, 46-5-41; 46-6-3, 46-6-3.1, 46-6-5, 46-6-6.1, 46-6-10, 46-6-14 and Commission Rules ARSD 52:01:01:01 thru 52:01:01:13, for a permit to appropriate for beneficial use 3.0 cubic feet of water per second of time from ground water Well Field No.2, (two wells) through the Kingbrook Rural Water System/, the point(s) of diversion of which ~~xx~~(are) to be located in the SE $\frac{1}{4}$ NE $\frac{1}{4}$, Section 8 and NE $\frac{1}{4}$ NE $\frac{1}{4}$

of Section 17, Twp. 105N, Range 51W. Said water to be used for the purpose of providing ~~XX~~

water supplies for a rural water system

This Application No. 4367-3 will be considered by the Water Rights Commission at SDEA Auditorium 411 E. Capitol, Pierre, SD upon the 31st day of January, 1979

at 10 A .M. The Commission is authorized to make a determination on this application at the hearing. All interested persons may appear and be heard. Any person who may be affected by a Commission decision who desires to present evidence or cross-examine witnesses according to SDCL 1-26 may notify the Commission in writing prior to the hearing or orally at the hearing.

This hearing is an adversary proceeding. Any person has the right to be present or to be represented by a lawyer. These and other due process rights will be forfeited if they are not exercised at the hearing. Decisions of the Commission may be appealed to the Courts as provided by law.

WATER RIGHTS COMMISSION

BETTY WESTLUND
Water Rights Specialist

cc: Kingbrook Rural Water System, Inc., DeSmet, SD 57231

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County Lake) ss.
County _____)

I, Merrill D. Hunter hereby
certify that the annexed printed copy of Notice of Intent to Appropriate

Water was taken from the Madison Daily Leader

A newspaper which during the whole time of publication of said notice
herein after stated, has been and is printed and published in the

City of Madison

County of Lake and State of South Dakota;
that the said notice was published in said newspaper on the following
two dates:

Thursday the 18th day of January, 1979

Thursday the 25th day of January, 1979

Merrill D. Hunter
(Signature)

Publisher
(Title)

Jan. 25, 1979
(Date Signed)

4

Thursday, January 18, 1979
Madison, S.D. Daily Leader

Jan. 18 & 25

NOTICE OF HEARING ON
APPLICATION TO
APPROPRIATE WATER

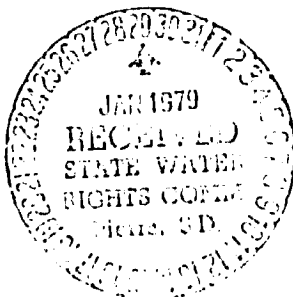
Pierre, South Dakota 57501
January 15, 1979

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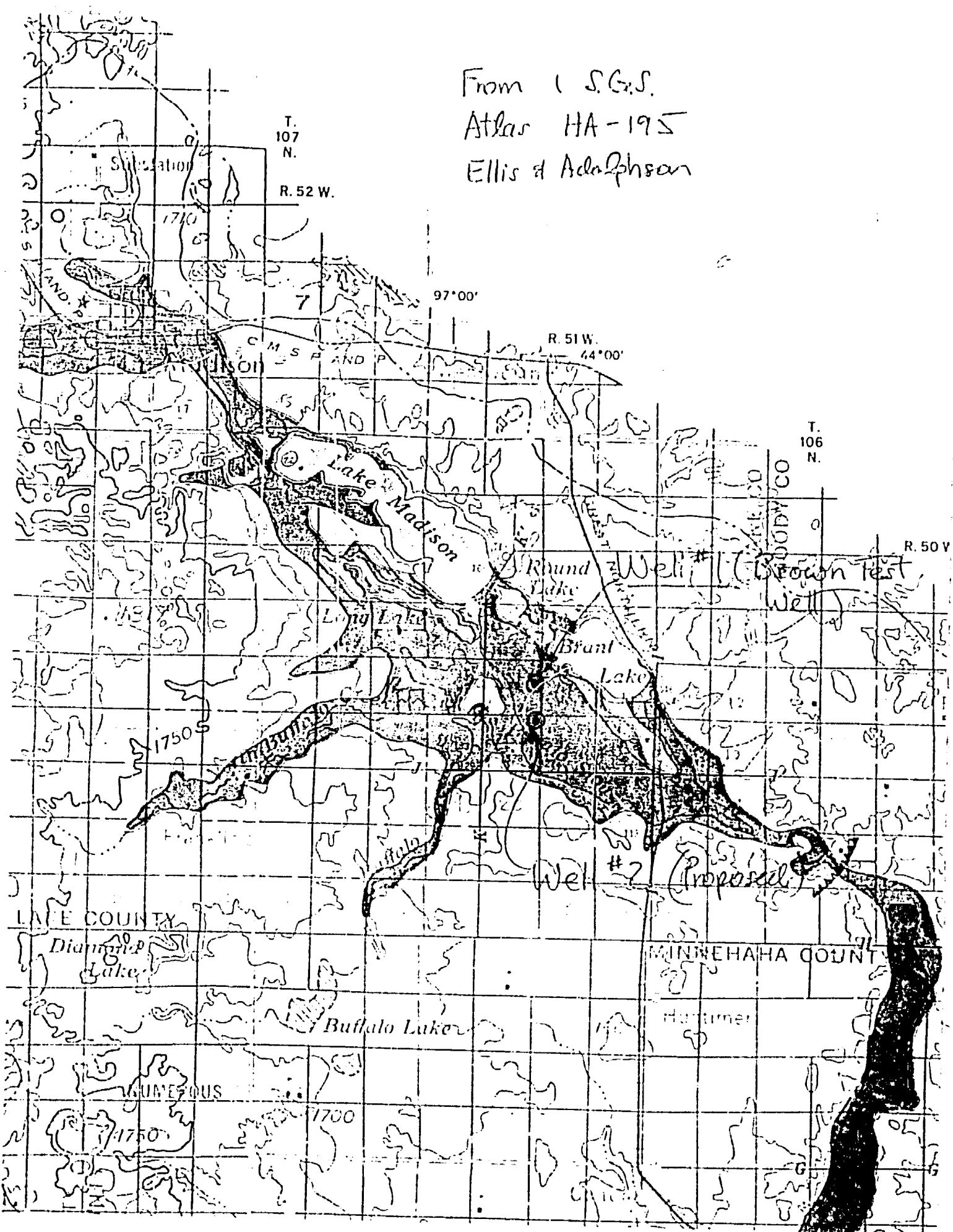
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WATER RIGHTS COMMISSION
BETTY WESTLUND
Water Rights Specialist



From U.S.G.S.
Atlas HA-195
Ellis & Adolphson



T.
107
N.
R. 52 W.

97°00'

R. 51 W.
64°00'

T.
106
N.

R. 50 W.

LATE COUNTY

MINNEHAHA COUNTY

Diamond Lake

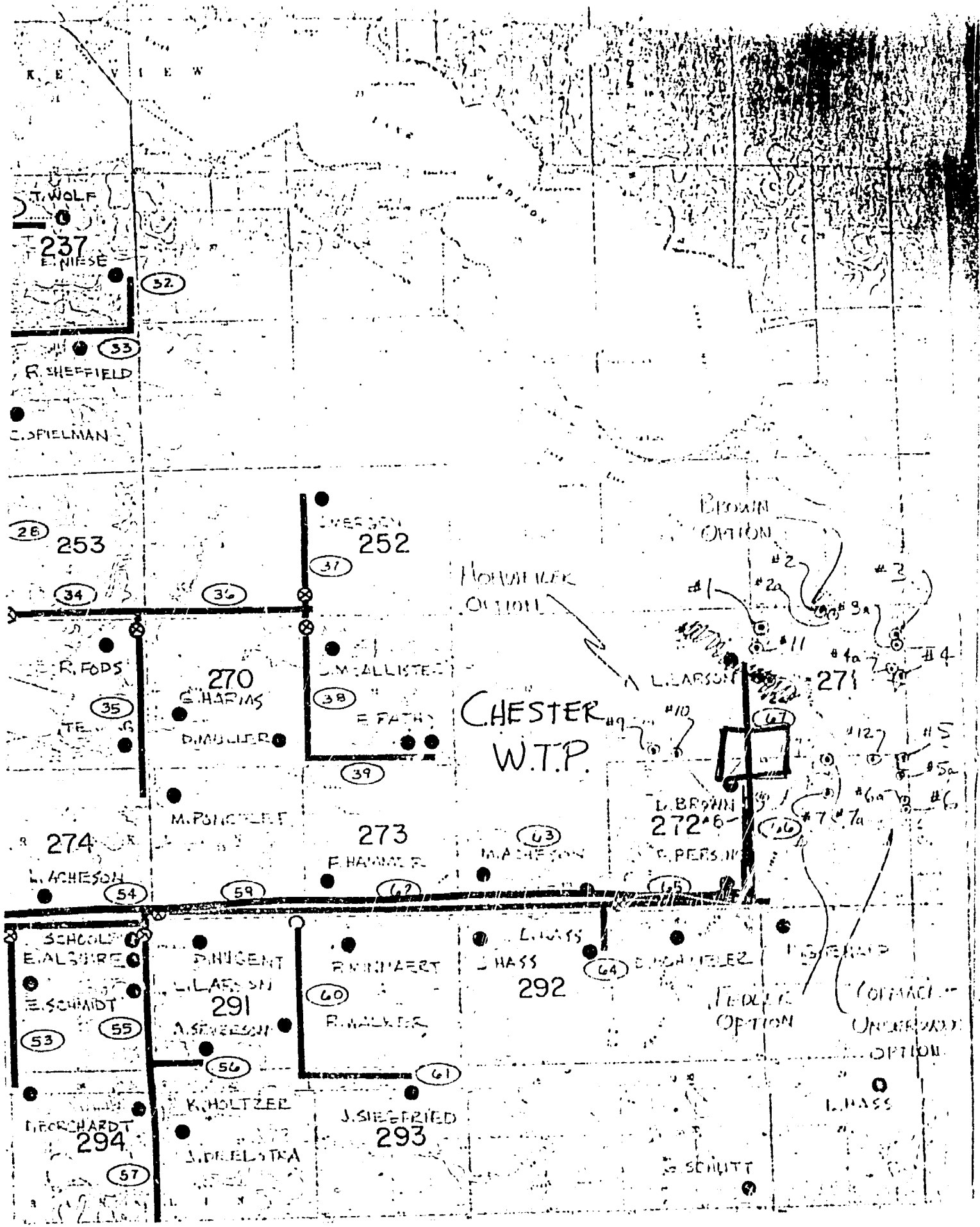
Buffalo Lake

Hartman

MINNEAPOLIS

1700

1750



GRIMSHAW DRILLING CO.

DRILLING
LOG924 South Melrose
Sioux Falls, S.D. 57106
Phone 505-332-6974Name Kingbrook Rural Water Date 11-1-78
Address Phase 3
County Lake Sec. 1 Twp. 1 Range 1

NO. FT.	DIA.	RATE	CASING	TOTAL
60'	4 3/4"	33.00	—	\$186.00
50'		26.00	2"	\$300.00
14'		34.00	2"	\$56.00
16'	4 3/4"	33.00	Drilling	\$48.00
BALANCE DUE:				\$584.00

#1 0 ft. to 1 ft. Topsoil #2 0 ft. to 1 ft. Topsoil

1 ft. to 16 ft. Red Gravel 1 ft. to 3 ft. Brown clay
16 ft. to 24 ft. Red Gravel 3 ft. to 40 ft. Red sand & gravel
24 ft. to 60 ft. Blue clay 40 ft. to 55 ft. Blue clayWild corner of Uren Browns 55 ft. to 69 ft. Gray Sand
69 ft. to 80 ft. Blue clay
100 yds E. of bridgeS. Edge of Uren Browns
1/2 mile
changed to 64' - bottom
20' slottedSTATIC WATER LEVEL $\frac{4}{2} = 28$ ft.

REMARKS:

J. M. Miller
DRILLER

GRIMSHAW DRILLING CO.

DRILLING
LOG924 South Melrose
Sioux Falls, S.D. 57106
Phone 505-332-6974Name Kingbrook Rural Water Date 11-1-78
Address Phase 3
County Lake Sec. 1 Twp. 1 Range 1

NO. FT.	DIA.	RATE	CASING	TOTAL
34'	4 3/4"	36.00	2"	\$204.00
21'	4 3/4"	33.00	Drilling	\$98.00
BALANCE DUE:				\$282.00

#3 0 ft. to 1 ft. Topsoil

1 ft. to 5 ft. Brown clay
5 ft. to 45 ft. Red Sand & Gravel
45 ft. to 60 ft. Blue clay

changed to 34' slotted bottom 20'

VERN Brown home Gravel
200 yds S. of buildings
E. Edge of GravelSTATIC WATER LEVEL $\frac{29}{1} = 29$ ft.J. M. Miller
DRILLER

REMARKS: No binnacle used - but we just a lot of hole - should represent upper water

DRILLING LOG

524 South Melrose
Sioux Falls, S.D. 57106
Phone 605-332-6974

County San Sec. Twp. Range

BALANCE DUE: \$240.00

[illegible]

_____ ft. to _____ ft. _____

_____ ft. to _____ ft. _____

STATIC WATER LEVEL _____ ft. *James M. 1.2.2002*

REMARKS:  J. MILLER

DRILLING LOG

**924 South Melrose
Sioux Falls, S.D. 57106
Phone 605-332-6974**

County LAKE Sec. Twp. Range

BALANCE DUE:				\$5.11
--------------	--	--	--	--------

f_1 , 10 f_1 f_1 , 10

N.E. corner of 1st acre tract

STATIC WATER LEVEL 18 ft. Jay M. Wolf

DRILLER W. M. B. B. B.

REMARKS: 2 1/2 bags of bentonite used - see finished with clean water & blow with air. Eng

GRIMSHAW DRILLING CO.

DRILLING
LOG

924 South Melrose
Sioux Falls, S.D. 57106
Phone 605-332-6974

Name Kingbrook Rural Water Date 11-2-78
Address Phase 3
County Lake Sec. Twp. Range

NO. FT.	DIA.	RATE	CASING	TOTAL
50'	4 1/4"	\$6.00	2"	\$300.00
8'	"	\$4.00	"	\$32.00
12'	"	\$3.00	Drilling	36.00
- - - - - Cornneck + Underused land				
BALANCE DUE:				\$368.00

#6 0 ft. to 1 ft. Topsoil
1 ft. to 28 ft. Red Gravel & sand
28 ft. to 32 ft. Blue clay
32 ft. to 58 ft. Fine to Medium Gray Sand
58 ft. to 80 ft. Blue clay
80 ft. to 100 ft. Blue clay
100 ft. to 120 ft. Blue clay
120 ft. to 140 ft. Blue clay
140 ft. to 160 ft. Blue clay
160 ft. to 180 ft. Blue clay
180 ft. to 200 ft. Blue clay
200 ft. to 220 ft. Blue clay
220 ft. to 240 ft. Blue clay
240 ft. to 260 ft. Blue clay
260 ft. to 280 ft. Blue clay
280 ft. to 300 ft. Blue clay
300 ft. to 320 ft. Blue clay
320 ft. to 340 ft. Blue clay
340 ft. to 360 ft. Blue clay
360 ft. to 380 ft. Blue clay
380 ft. to 400 ft. Blue clay
400 ft. to 420 ft. Blue clay
420 ft. to 440 ft. Blue clay
440 ft. to 460 ft. Blue clay
460 ft. to 480 ft. Blue clay
480 ft. to 500 ft. Blue clay
500 ft. to 520 ft. Blue clay
520 ft. to 540 ft. Blue clay
540 ft. to 560 ft. Blue clay
560 ft. to 580 ft. Blue clay
580 ft. to 600 ft. Blue clay
600 ft. to 620 ft. Blue clay
620 ft. to 640 ft. Blue clay
640 ft. to 660 ft. Blue clay
660 ft. to 680 ft. Blue clay
680 ft. to 700 ft. Blue clay
700 ft. to 720 ft. Blue clay
720 ft. to 740 ft. Blue clay
740 ft. to 760 ft. Blue clay
760 ft. to 780 ft. Blue clay
780 ft. to 800 ft. Blue clay
800 ft. to 820 ft. Blue clay
820 ft. to 840 ft. Blue clay
840 ft. to 860 ft. Blue clay
860 ft. to 880 ft. Blue clay
880 ft. to 900 ft. Blue clay
900 ft. to 920 ft. Blue clay
920 ft. to 940 ft. Blue clay
940 ft. to 960 ft. Blue clay
960 ft. to 980 ft. Blue clay
980 ft. to 1000 ft. Blue clay

REMARKS: No benacite used - We back flushed with water & air with air for

GRIMSHAW DRILLING CO.

DRILLING
LOG

924 South Melrose
Sioux Falls, S.D. 57106
Phone 605-332-6974

Name Kingbrook Rural Water Date 11-3-78
Address Phase 3
County Lake Sec. Twp. Range

NO. FT.	DIA.	RATE	CASING	TOTAL
50'	4 1/4"	\$6.00	2"	\$300.00
4'	"	\$4.00	"	\$16.00
6'	"	\$3.00	"	\$18.00
- - - - - Filler Benacite E. side on 1/2 mile line				
BALANCE DUE:				\$334.00

#7 0 ft. to 3 ft. Topsoil
3 ft. to 6 ft. Brown clay
6 ft. to 14 ft. Red Gravel & sand
14 ft. to 18 ft. Gray Sand (medium to fine texture)
18 ft. to 38 ft. Blue clay
38 ft. to 54 ft. Fine Gray Sand w/ some clay
54 ft. to 60 ft. Blue clay
60 ft. to 70 ft. Blue clay
70 ft. to 80 ft. Blue clay
80 ft. to 90 ft. Blue clay
90 ft. to 100 ft. Blue clay
100 ft. to 110 ft. Blue clay
110 ft. to 120 ft. Blue clay
120 ft. to 130 ft. Blue clay
130 ft. to 140 ft. Blue clay
140 ft. to 150 ft. Blue clay
150 ft. to 160 ft. Blue clay
160 ft. to 170 ft. Blue clay
170 ft. to 180 ft. Blue clay
180 ft. to 190 ft. Blue clay
190 ft. to 200 ft. Blue clay
200 ft. to 210 ft. Blue clay
210 ft. to 220 ft. Blue clay
220 ft. to 230 ft. Blue clay
230 ft. to 240 ft. Blue clay
240 ft. to 250 ft. Blue clay
250 ft. to 260 ft. Blue clay
260 ft. to 270 ft. Blue clay
270 ft. to 280 ft. Blue clay
280 ft. to 290 ft. Blue clay
290 ft. to 300 ft. Blue clay
300 ft. to 310 ft. Blue clay
310 ft. to 320 ft. Blue clay
320 ft. to 330 ft. Blue clay
330 ft. to 340 ft. Blue clay
340 ft. to 350 ft. Blue clay
350 ft. to 360 ft. Blue clay
360 ft. to 370 ft. Blue clay
370 ft. to 380 ft. Blue clay
380 ft. to 390 ft. Blue clay
390 ft. to 400 ft. Blue clay
400 ft. to 410 ft. Blue clay
410 ft. to 420 ft. Blue clay
420 ft. to 430 ft. Blue clay
430 ft. to 440 ft. Blue clay
440 ft. to 450 ft. Blue clay
450 ft. to 460 ft. Blue clay
460 ft. to 470 ft. Blue clay
470 ft. to 480 ft. Blue clay
480 ft. to 490 ft. Blue clay
490 ft. to 500 ft. Blue clay
500 ft. to 510 ft. Blue clay
510 ft. to 520 ft. Blue clay
520 ft. to 530 ft. Blue clay
530 ft. to 540 ft. Blue clay
540 ft. to 550 ft. Blue clay
550 ft. to 560 ft. Blue clay
560 ft. to 570 ft. Blue clay
570 ft. to 580 ft. Blue clay
580 ft. to 590 ft. Blue clay
590 ft. to 600 ft. Blue clay
600 ft. to 610 ft. Blue clay
610 ft. to 620 ft. Blue clay
620 ft. to 630 ft. Blue clay
630 ft. to 640 ft. Blue clay
640 ft. to 650 ft. Blue clay
650 ft. to 660 ft. Blue clay
660 ft. to 670 ft. Blue clay
670 ft. to 680 ft. Blue clay
680 ft. to 690 ft. Blue clay
690 ft. to 700 ft. Blue clay
700 ft. to 710 ft. Blue clay
710 ft. to 720 ft. Blue clay
720 ft. to 730 ft. Blue clay
730 ft. to 740 ft. Blue clay
740 ft. to 750 ft. Blue clay
750 ft. to 760 ft. Blue clay
760 ft. to 770 ft. Blue clay
770 ft. to 780 ft. Blue clay
780 ft. to 790 ft. Blue clay
790 ft. to 800 ft. Blue clay
800 ft. to 810 ft. Blue clay
810 ft. to 820 ft. Blue clay
820 ft. to 830 ft. Blue clay
830 ft. to 840 ft. Blue clay
840 ft. to 850 ft. Blue clay
850 ft. to 860 ft. Blue clay
860 ft. to 870 ft. Blue clay
870 ft. to 880 ft. Blue clay
880 ft. to 890 ft. Blue clay
890 ft. to 900 ft. Blue clay
900 ft. to 910 ft. Blue clay
910 ft. to 920 ft. Blue clay
920 ft. to 930 ft. Blue clay
930 ft. to 940 ft. Blue clay
940 ft. to 950 ft. Blue clay
950 ft. to 960 ft. Blue clay
960 ft. to 970 ft. Blue clay
970 ft. to 980 ft. Blue clay
980 ft. to 990 ft. Blue clay
990 ft. to 1000 ft. Blue clay

REMARKS: No benacite used - with pressure of clay in the fine sand - it would be

GRIMSHAW DRILLING CO.

DRILLING
LOG

924 South Melrose
Sioux Falls, S.D. 57106
Phone 605-332-6974

Name Kingbrook Rural Center Date 11-3-98

Phase 3

Address LaKe Sec. Twp. Range

NO. FT.	DIA.	RATE	CASING	TOTAL
20'	4 3/4"	\$3.00	—	\$240.00

BALANCE DUE: \$240.00

#8

0 ft. to 2 ft. Topsoil ft. to ft.

2 ft. to 16 ft. Brown clay ft. to ft.

16 ft. to 20 ft. Blue clay ft. to ft.

20 ft. to 26 ft. Brown clay ft. to ft.

26 ft. to 38 ft. Grey sand w/pecks ft. to ft.

38 ft. to 80 ft. Blue clay ft. to ft.

80 ft. to ft. ft. to ft.

ft. to ft. ft. to ft.

ft. to ft. ft. to ft.

ft. to ft. ft. to ft.

ft. to ft. ft. to ft.

STATIC WATER LEVEL ft.

REMARKS: Not enough sand to mix

Gary M. Webb
DRILLER

GRIMSHAW DRILLING CO.

DRILLING
LOG

924 South Melrose
Sioux Falls, S.D. 57106
Phone 605-332-6974

Name Kingbrook Rural Center Date 11-3-98

Phase 3

Address LaKe Sec. Twp. Range

NO. FT.	DIA.	RATE	CASING	TOTAL
20'	4 3/4"	\$3.00	—	\$240.00

BALANCE DUE: \$240.00

#9

0 ft. to 2 ft. Topsoil ft. to ft.

2 ft. to 6 ft. Brown clay ft. to ft.

6 ft. to 7 ft. Red Gravel ft. to ft.

7 ft. to 14 ft. Blue clay ft. to ft.

14 ft. to 26 ft. Coarse Grey Sand ft. to ft.

26 ft. to 80 ft. Blue clay ft. to ft.

80 ft. to ft. ft. to ft.

ft. to ft. ft. to ft.

ft. to ft. ft. to ft.

ft. to ft. ft. to ft.

ft. to ft. ft. to ft.

ft. to ft. ft. to ft.

STATIC WATER LEVEL ft.

REMARKS: Not enough sand to mix

Gary M. Webb
DRILLER

GRIMSHAW DRILLING CO.

DRILLING LOG

**924 South Melrose
Sioux Falls, S.D. 57106
Phone 605-332-6974**

Name Kingbrook Ryan Date 11-2-98
Place 3

Address _____
County San Sec. _____ Twp. _____ Range _____

NO. FT.	DIA.	RATE	CASING	TOTAL
106'	4 3/8"	133. ⁰⁰	—	\$3300. ⁰⁰
BALANCE DUE:				\$3300. ⁰⁰

8752.00

#11 2 ft. 10 in. Topsoil ft. 10 in.

1 ft. to 3 ft. Red Gravel _____ ft. to _____ ft.

.3 ft. 10 14 ft. Brown "Var" _____ ft. 10 _____ ft.
_____ ft. 10 24 - Brown "Var" w/ some stained _____ ft.

14 ft. 10 in. 24 ft. 10 in. 24 ft. 10 in. 24 ft. 10 in.

28 ft. to 30 ft. Blue clay _____ ft. to _____ ft.

30 ft. to 30 ft. Blue clay _____ ft. to _____ ft.

ft. 10 ft. 10 ft.

Verona Brooks' W. Quarter
ft. 10 ft. 10 ft.

300 yds S. of 1 acre

ft. to ft. ft. to ft.

ft. to ft. ft. to ft.

and M. L. Hall

For: M. Lloyd
DRILLED

REMARKS: No further work on this.

DRILLING LOG

Name Kingsbrook Rural Water Date 11-8-98

Address Phase 3

County Lake Sec. Twp. Range

七

0 ft. to 2 ft. Topsoil

2 ft. 10 in. to 6 ft. Brown Clay 2 ft. 10 in.

10 ft. 10 33 ft. Red Sand & gravel ft. 10 ft.

33 ft. 10 38 ft. 5/4" clay

38 ft. 10 102 ft. TRUE to Medium 2nd 2nd ft. 10

623 ft. 10 80 ft. Blue clay _____ ft. 10 _____ " "

ft. to ft. _____

ft. to _____ ft. _____ ft.

_____ ft. to _____ ft.

_____ ft. to _____ ft. _____ ft. to _____ ft.

ft. 10 ft. ft. 10 ft.

STATIC WATER LEVEL _____ ft. 0 any m. (city)
biller

REMARKS: .

DRILLING LOG

Name Kinghoben Date 11-8-99

Address _____ Phase 3

County Leake Sec. Twp. Range

1

0 ft. 10 in. Topsoil

ft. 10 5 ft. 8 Brown r/day ft. 10 ft.

5 ft. 10 in. 30 ft. Red Sand + Gravel ft. 12 ft.

37 ft. to 50 ft. Blue clay ft. to ft.

20 ft. to 68 ft. Gravel Sand _____ ft. to _____ ft.

68 ft. to 80 ft. Blue clay & shale ft. to ft.

ft. 10 ft. 10 ft.

CHSed 10 6a
ft. 10 ft. 10

_____ ft. to _____ ft. _____ ft. to _____ ft.

_____ ft. 10 _____ ft. _____ ft. 10 _____ ft.

_____ ft. 10 _____ ft. _____

_____ ft. 10 _____ ft. _____

STATIC WATER LEVEL 31 ft. Aug 17 1917

REMARKS: 7

DRILLING LOG

Name K. J. Breaker Date 11-2-78

Phase 3

County DAKE Sec. _____ Twp. _____ Range _____

NO. FT.	DIA.	RATE	CASING	TOTAL
40'	4 3/4"	\$3.00	—	\$120.00
10'	200' S. of #3			
DEEP	Brown's E. Quarter			
BALANCE DUE:				\$120.00

BALANCE DUE:

5/20/20

0 ft. to 1 ft. <u>Topsoil</u>	1 ft. to 2 ft. <u>Gravel</u>	2 ft. to 3 ft. <u>Sand</u>	3 ft. to 4 ft. <u>Clay</u>
4 ft. to 5 ft. <u>Red</u>	5 ft. to 6 ft. <u>Green</u>	6 ft. to 7 ft. <u>Blue</u>	7 ft. to 8 ft. <u>Black</u>
8 ft. to 9 ft. <u>Blue</u>	9 ft. to 10 ft. <u>Black</u>	10 ft. to 11 ft. <u>Black</u>	11 ft. to 12 ft. <u>Black</u>
12 ft. to 13 ft. <u>Black</u>	13 ft. to 14 ft. <u>Black</u>	14 ft. to 15 ft. <u>Black</u>	15 ft. to 16 ft. <u>Black</u>
16 ft. to 17 ft. <u>Black</u>	17 ft. to 18 ft. <u>Black</u>	18 ft. to 19 ft. <u>Black</u>	19 ft. to 20 ft. <u>Black</u>
20 ft. to 21 ft. <u>Black</u>	21 ft. to 22 ft. <u>Black</u>	22 ft. to 23 ft. <u>Black</u>	23 ft. to 24 ft. <u>Black</u>
24 ft. to 25 ft. <u>Black</u>	25 ft. to 26 ft. <u>Black</u>	26 ft. to 27 ft. <u>Black</u>	27 ft. to 28 ft. <u>Black</u>
28 ft. to 29 ft. <u>Black</u>	29 ft. to 30 ft. <u>Black</u>	30 ft. to 31 ft. <u>Black</u>	31 ft. to 32 ft. <u>Black</u>
32 ft. to 33 ft. <u>Black</u>	33 ft. to 34 ft. <u>Black</u>	34 ft. to 35 ft. <u>Black</u>	35 ft. to 36 ft. <u>Black</u>
36 ft. to 37 ft. <u>Black</u>	37 ft. to 38 ft. <u>Black</u>	38 ft. to 39 ft. <u>Black</u>	39 ft. to 40 ft. <u>Black</u>
40 ft. to 41 ft. <u>Black</u>	41 ft. to 42 ft. <u>Black</u>	42 ft. to 43 ft. <u>Black</u>	43 ft. to 44 ft. <u>Black</u>
44 ft. to 45 ft. <u>Black</u>	45 ft. to 46 ft. <u>Black</u>	46 ft. to 47 ft. <u>Black</u>	47 ft. to 48 ft. <u>Black</u>
48 ft. to 49 ft. <u>Black</u>	49 ft. to 50 ft. <u>Black</u>	50 ft. to 51 ft. <u>Black</u>	51 ft. to 52 ft. <u>Black</u>
52 ft. to 53 ft. <u>Black</u>	53 ft. to 54 ft. <u>Black</u>	54 ft. to 55 ft. <u>Black</u>	55 ft. to 56 ft. <u>Black</u>
56 ft. to 57 ft. <u>Black</u>	57 ft. to 58 ft. <u>Black</u>	58 ft. to 59 ft. <u>Black</u>	59 ft. to 60 ft. <u>Black</u>
60 ft. to 61 ft. <u>Black</u>	61 ft. to 62 ft. <u>Black</u>	62 ft. to 63 ft. <u>Black</u>	63 ft. to 64 ft. <u>Black</u>
64 ft. to 65 ft. <u>Black</u>	65 ft. to 66 ft. <u>Black</u>	66 ft. to 67 ft. <u>Black</u>	67 ft. to 68 ft. <u>Black</u>
68 ft. to 69 ft. <u>Black</u>	69 ft. to 70 ft. <u>Black</u>	70 ft. to 71 ft. <u>Black</u>	71 ft. to 72 ft. <u>Black</u>
72 ft. to 73 ft. <u>Black</u>	73 ft. to 74 ft. <u>Black</u>	74 ft. to 75 ft. <u>Black</u>	75 ft. to 76 ft. <u>Black</u>
76 ft. to 77 ft. <u>Black</u>	77 ft. to 78 ft. <u>Black</u>	78 ft. to 79 ft. <u>Black</u>	79 ft. to 80 ft. <u>Black</u>
80 ft. to 81 ft. <u>Black</u>	81 ft. to 82 ft. <u>Black</u>	82 ft. to 83 ft. <u>Black</u>	83 ft. to 84 ft. <u>Black</u>
84 ft. to 85 ft. <u>Black</u>	85 ft. to 86 ft. <u>Black</u>	86 ft. to 87 ft. <u>Black</u>	87 ft. to 88 ft. <u>Black</u>
88 ft. to 89 ft. <u>Black</u>	89 ft. to 90 ft. <u>Black</u>	90 ft. to 91 ft. <u>Black</u>	91 ft. to 92 ft. <u>Black</u>
92 ft. to 93 ft. <u>Black</u>	93 ft. to 94 ft. <u>Black</u>	94 ft. to 95 ft. <u>Black</u>	95 ft. to 96 ft. <u>Black</u>
96 ft. to 97 ft. <u>Black</u>	97 ft. to 98 ft. <u>Black</u>	98 ft. to 99 ft. <u>Black</u>	99 ft. to 100 ft. <u>Black</u>

STATIC WATER LEVEL 27 ft.

James M. Clark

REMARKS: We anticipated having about 40' of upper sand but if used this would only

DRILLING LOG

Name Kinabrock Rural School Date 11-9-98

Phase:

County Adair Sec. 1 Twp. 1 Range 1

NO. FT.	DIA.	RATE	CASING	TOTAL
50'	4 3/4"	\$6.00	2"	\$300.00
13'	4 3/4"	\$41.00	2"	\$92.60
12'	4 3/4"	\$3.00	Drilling	\$36.00
QA 101	NW 1/4	" 4		
1/2 acre Browns 2nd corner				
BALANCE DUE:				\$3408.00

BALANCE DUE:

28908.06

	ft.	to	1 ft.	Topsoil		ft.	to	ft.
	ft.	to	5 ft.	Brown clay		ft.	to	ft.
	ft.	to	36 ft.	Red Sand & Gravel		ft.	to	ft.
	ft.	to	49 ft.	Blue Clay		ft.	to	ft.
	ft.	to	68 ft.	Grey Sand		ft.	to	ft.
	ft.	to	80 ft.	Blue clay		ft.	to	ft.
	ft.	to	ft.			ft.	to	ft.
cased	ft.	to	68'	slopped		ft.	to	ft.
bottom	ft.	to	20'	pumped w/air		ft.	to	ft.
for	ft.	to	1 1/4 hrs - clean sample			ft.	to	ft.
	ft.	to	ft.			ft.	to	ft.
STATIC WATER LEVEL			25' ft.	Jerry M. Webb				

STATIC WATER LEVEL 47.2 ft.

Sam N. Webb

REMARKS:

GRIMSHAW DRILLING CO.

DRILLING
LOG924 South Melrose
Sioux Falls, S.D. 57106
Phone 605-332-6974Name Kingbrook Rural Water Date 11-8-98Address Phase 3County Lake Sec. Twp. Range

NO. FT.	DIA.	RATE	CASING	TOTAL
50'	4 1/4"	\$6.00	2"	\$300.00
9'	4 1/4"	\$4.00	2"	\$36.00
11'	4 3/4"	\$3.00	—	\$33.00
2 20' S + 10' H. of ALT.				
measure of cement + underground mud				
BALANCE DUE:				\$369.00

0 ft. to 2 ft. Topsoil	ft. to ft.
2 ft. to 5 ft. Brown Clay	ft. to ft.
5 ft. to 28 ft. Red Sand + Gravel	ft. to ft.
28 ft. to 39 ft. Blue Clay	ft. to ft.
39 ft. to 59 ft. Grey Sand	ft. to ft.
59 ft. to 70 ft. Blue Clay	ft. to ft.
70 ft. to 59' slotted	ft. to ft.
bottom 20' Pumped with ARE	ft. to ft.
for 2 hrs. - clean sample	ft. to ft.

STATIC WATER LEVEL 21' ft. Sandy M. Caldwell
DRILLERREMARKS: No bentonite used + no back
flushing - 600 gal. drill water used,

GRIMSHAW DRILLING CO.

DRILLING
LOG924 South Melrose
Sioux Falls, S.D. 57106
Phone 605-332-6974Name Kingbrook Rural Water Date 11-6-98Address County Lake Sec. Twp. Range

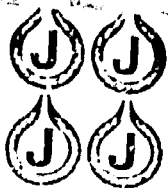
NO. FT.	DIA.	RATE	CASING	TOTAL
50'	4 1/4"	\$6.00	2"	\$300.00
5'	"	\$4.00	"	\$20.00
5'	"	\$3.00	—	\$15.00
Cement + Underground mud				
.300 ft. H. of ALT.				\$35.00
BALANCE DUE:				\$335.00

0 ft. to 2 ft. Topsoil	ft. to ft.
2 ft. to 5 ft. Brown Clay	ft. to ft.
5 ft. to 28 ft. Red Sand + Gravel	ft. to ft.
28 ft. to 36 ft. Blue Clay	ft. to ft.
36 ft. to 55 ft. Grey to Medium Grey Sand	ft. to ft.
55 ft. to 60 ft. Blue Clay	ft. to ft.
60 ft. to 55' slotted	ft. to ft.
bottom 20'	ft. to ft.
ft. to ft.	ft. to ft.
ft. to ft.	ft. to ft.

STATIC WATER LEVEL 15' ft. Sandy M. Caldwell
DRILLERREMARKS: No bentonite used - we did not
back flush - pumped with ARE FOR

DRILLING LOG

REMARKS: Did not look as good as 49
or just across road for mulch - possible



Johnson Division
P.O. Box 43 • St. Paul, Minnesota 55164
Telephone 612-636-3900 • Telex 29-7451
UOP Inc.

SAND ANALYSIS

(FINE)

MAILING ADDRESS: P.O. BOX 43118
ST. PAUL, MINNESOTA • 55164

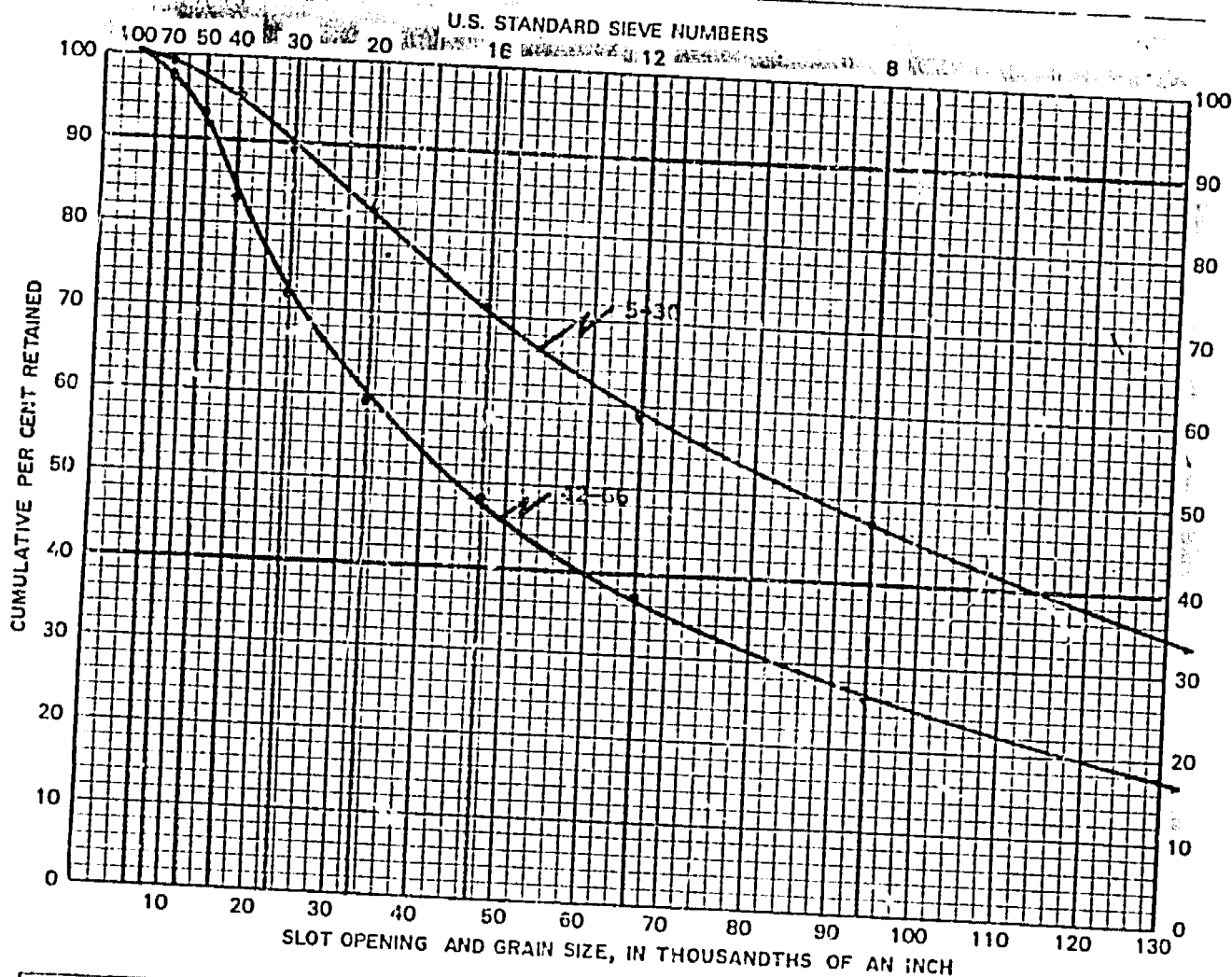
Sample sent in by Grinchaw Drilling Co.

Town Sioux Falls,

State S. Dak. Zip 57106 Date 21 Nov. 78

From well of #5

Remarks: _____



U.S. SIEVE NO.	SIEVE OPENING (INCHES)	MM	CUMULATIVE PER CENT RETAINED
6	.132	3.36	43
8	.094	2.38	47
12	.066	1.68	51
16	.047	1.19	57
20	.033	0.84	61
30	.023	0.60	72
40	.016	0.42	83
60	.012	0.30	93
70	.008	0.21	97
100	.006	.15	99

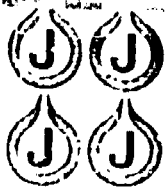
Notes: _____

Recommended Slot Opening: _____

Recommended Screen: Dia _____ in. Length _____ Ft.

By: _____

SO MANY CONSIDERATIONS ENTER INTO THE MAKING OF A GOOD WELL THAT, WHILE WE BELIEVE SLOT SIZES FURNISHED OR RECOMMENDED FROM SAND SAMPLES ARE CORRECT WE ASSUME NO RESPONSIBILITY FOR THE SUCCESSFUL OPERATION OF JOHNSON WELL SCREENS.



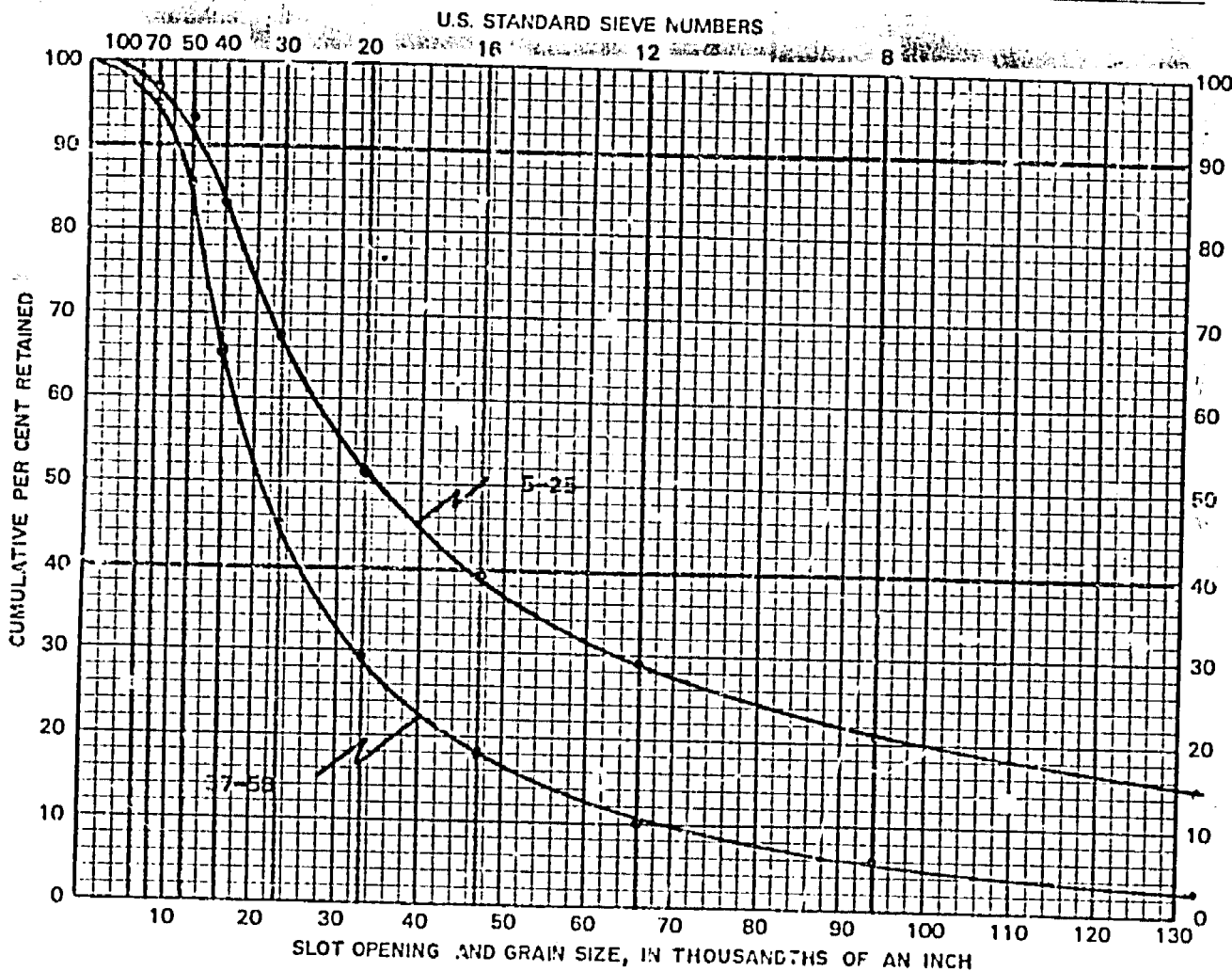
Johnson Division
P.O. Box 8 • St. Paul, Minnesota 55164
Telephone 612-636-3900 • Telex 29-7451
UOP Inc.

SAND ANALYSIS

(FINE)

MAILING ADDRESS: P.O. BOX 43118
ST. PAUL, MINNESOTA • 55164

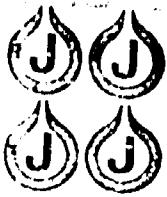
Sample sent in to Grinchaw Drilling Co.
Town Sioux Falls, State S. Dak. Zip 57106 Date 21 Novy 78
From well of 86
Remarks: _____



U.S. SIEVE NO.	SLOT OPENING INCHES	MM	CUMULATIVE RETAINED	
6	.132	3.36	37-58	5-25
8	.094	2.38	63	21
12	.066	1.68	10	29
16	.047	1.19	18	31
20	.033	.84	29	31
30	.023	.60	45	67
40	.016	.42	65	83
50	.012	.30	85	93
70	.008	.21	95	97
100	.006	.15		

Notes: _____
Recommended Slot Opening: _____
Recommended Screen: Dia. _____ in. Length _____ Ft.
By: _____

SO MANY CONSIDERATIONS ENTER INTO THE MAKING OF A GOOD WELL THAT, WHILE WE BELIEVE SLOT SIZES FURNISHED OR RECOMMENDED FROM SAND SAMPLES ARE CORRECT WE ASSUME NO RESPONSIBILITY FOR THE SUCCESSFUL OPERATION OF JOHNSON WELL SCREENS.

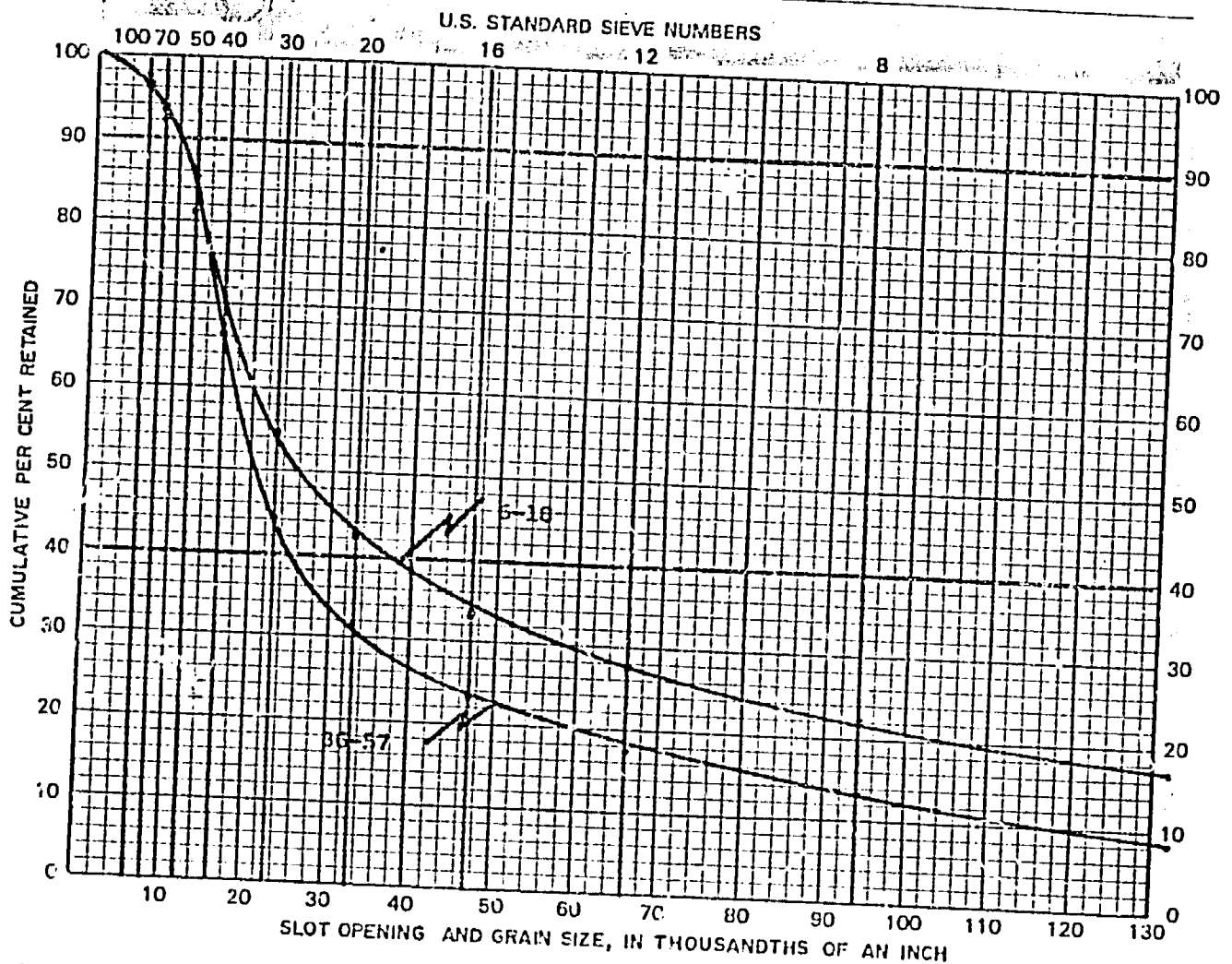


Johnson Division
P.O. Box 4 8 • St. Paul, Minnesota 55164
Telephone 612-636-3900 • Telex 29-7451
UOP Inc.

SAND ANALYSIS (FINE)

MAILING ADDRESS: P.O. BOX 43118
ST. PAUL, MINNESOTA • 55164

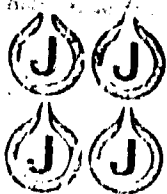
Sample sent in by Graham Drilling Co.
Town Sioux Falls, State S. Dak. Zip 57106 Date 21 Nov. 73
From well of #7
Remarks: _____



U.S. SIEVE NO.	SEIVE OPENING IN INCHES	SEIVE OPENING IN MM	CUMULATIVE PERCENT RETAINED
6	1.32	3.36	100
8	.094	2.39	100
12	.066	1.68	100
16	.047	1.19	100
20	.033	.84	100
30	.023	.60	100
40	.016	.42	100
50	.012	.30	100
70	.008	.21	100
100	.006	.15	100

Notes: _____
Recommended Slot Opening: _____
Recommended Screen: Dia _____ in. Length _____ Ft.
By: _____

SO MANY CONSIDERATIONS ENTER INTO THE MAKING OF A GOOD WELL THAT, WHILE WE BELIEVE SLOT SIZES FURNISHED OR RECOMMENDED FROM SAND SAMPLES ARE CORRECT WE ASSUME NO RESPONSIBILITY FOR THE SUCCESSFUL OPERATION OF JOHNSON WELL SCREENS.



Johnson Division
P.O. Box 43 • St. Paul, Minnesota 55164
Telephone 612-636-3900 • Telex 29-7451
UOP Inc.

SAND ANALYSIS (FINE)

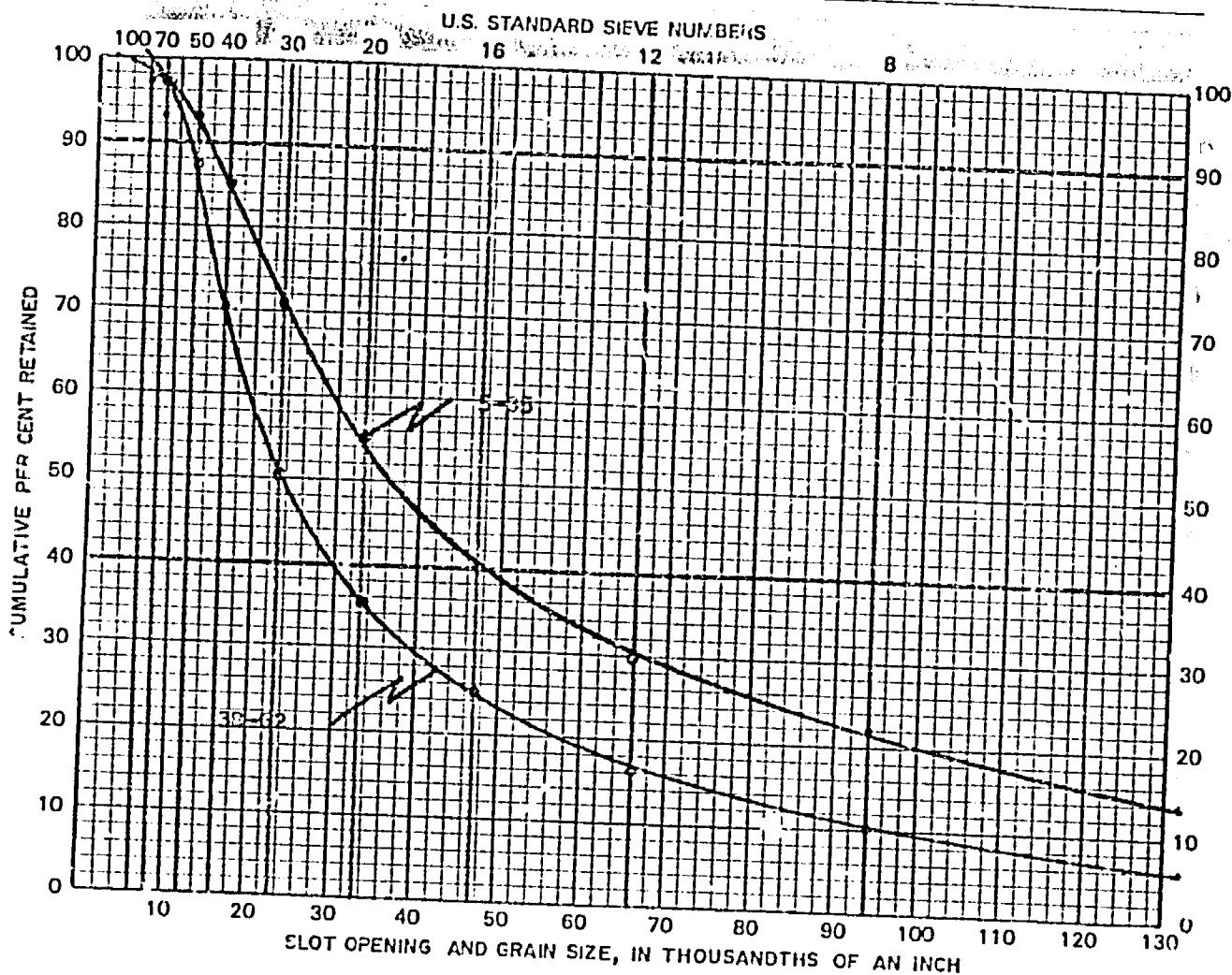
MAILING ADDRESS: P.O. BOX 43118
ST. PAUL, MINNESOTA • 55164

Sample sent in by Grinchaw Drilling Co.

Town Sioux Falls, State S. Dak. Zip 57106 Date 21 Nov. 78

From well of #12

Remarks: _____



U.S. SIEVE NO.	SIEVE OPENING (INCHES)	SIEVE OPENING (MM)	CUMULATIVE PER CENT RETAINED
6	.132	3.36	100
8	.094	2.38	100
12	.066	1.68	100
16	.047	1.19	100
20	.033	.84	100
30	.023	.60	100
40	.016	.42	100
50	.012	.30	100
70	.009	.21	100
100	.006	.15	100

Notes: _____

Recommended Slot Opening: _____

Recommended Screen Dia _____ In Length _____ Ft.

By: _____

SO MANY CONSIDERATIONS ENTER INTO THE MAKING OF A GOOD WELL THAT, WHILE WE BELIEVE SLOT SIZES FURNISHED OR RECOMMENDED FROM SAND SAMPLES ARE CORRECT WE ASSUME NO RESPONSIBILITY FOR THE SUCCESSFUL OPERATION OF JOHNSON WELL SCREENS.



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UOP Inc.

SAND ANALYSIS (FINE)

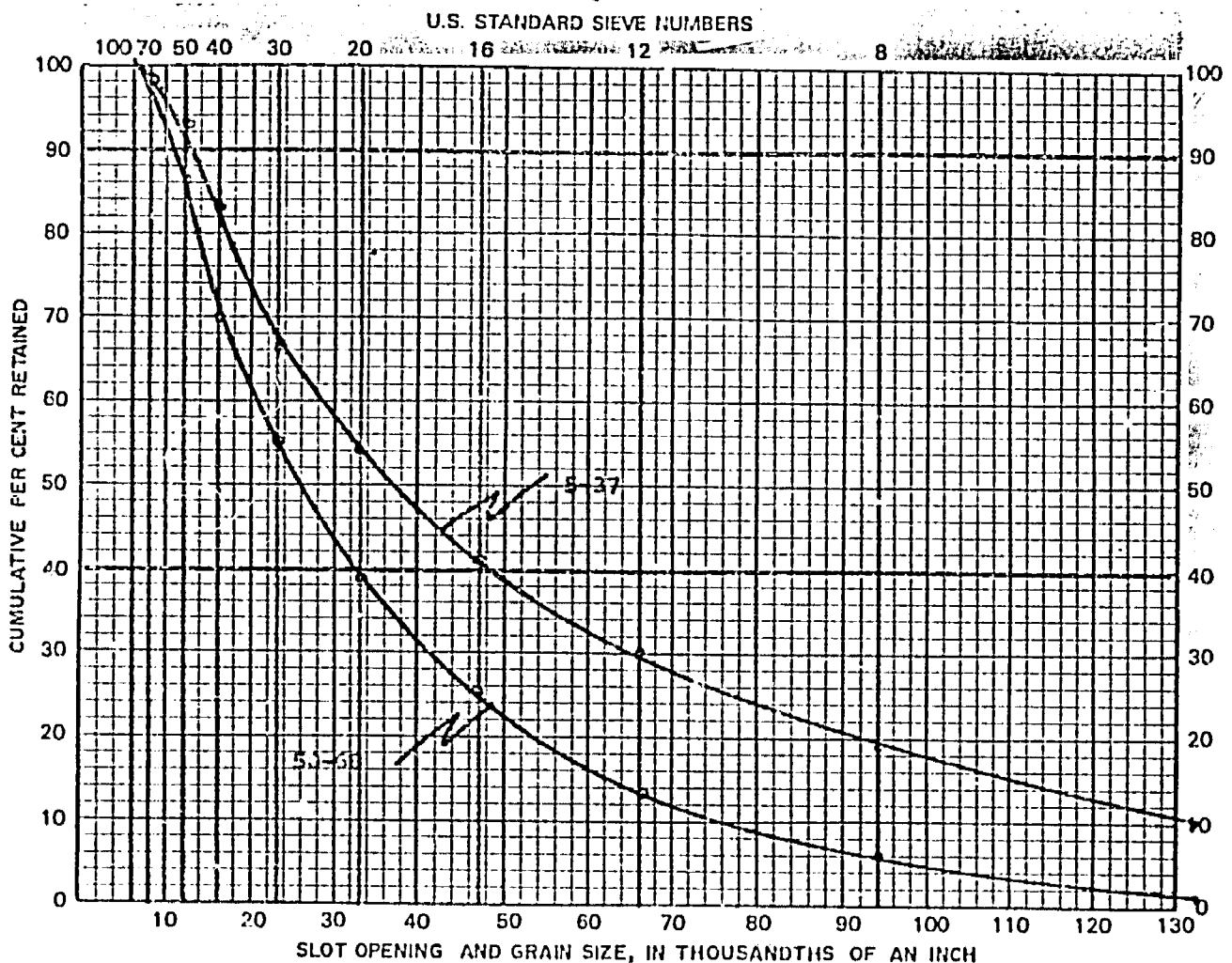
MAILING ADDRESS: P.O. BOX 43118
ST. PAUL, MINNESOTA • 55164

Sample sent in by Grimshaw Drilling Co.

Town Sicau Falls, State S. Dak. Zip 57106 Date 21 Nov. 78

From well of #2A

Remarks: _____



U.S. SIEVE NO.	SIEVE OPENING INCHES	MM	CUMULATIVE PER CENT RETAINED
6	.132	3.36	100
8	.094	2.38	100
12	.066	1.68	100
16	.047	1.19	100
20	.033	0.84	100
30	.023	0.60	100
40	.016	0.42	100
50	.012	0.30	100
70	.008	0.21	100
100	.006	0.15	100

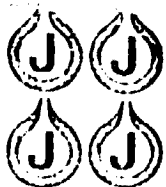
Notes: _____

Recommended Slot Opening: _____

Recommended Screen: Dia. _____ in. Length _____ Ft.

By: _____

SO MANY CONSIDERATIONS ENTER INTO THE MAKING OF A GOOD WELL THAT, WHILE WE BELIEVE SLOT SIZES FURNISHED OR RECOMMENDED FROM SAND SAMPLES ARE CORRECT WE ASSUME NO RESPONSIBILITY FOR THE SUCCESSFUL OPERATION OF JOHNSON WELL SCREENS.

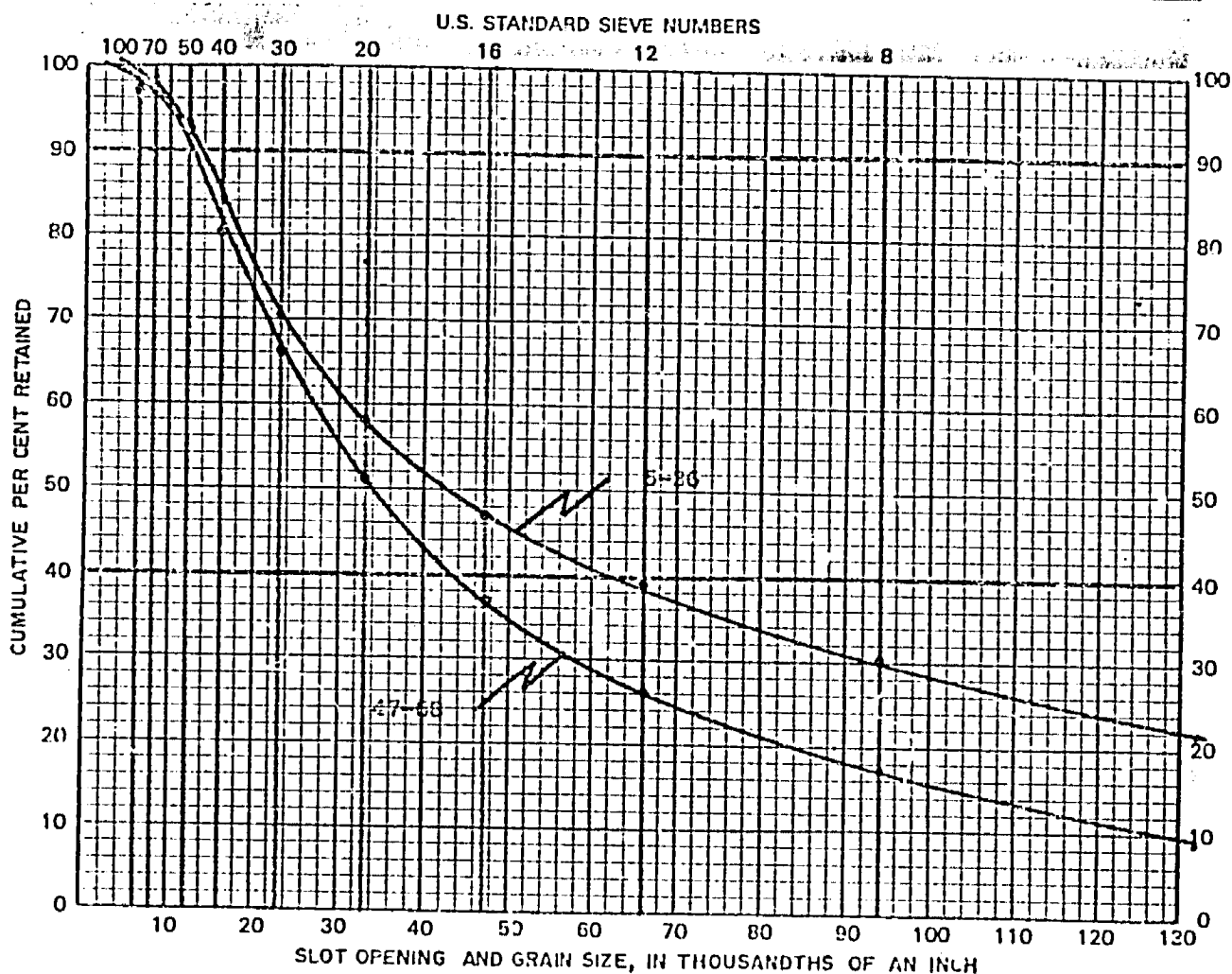


Johnson Division
P.O. Box 118 • St. Paul, Minnesota 55164
Telephone 612-636-3900 • Telex 29-7451
UOP Inc.

SAND ANALYSIS (FINE)

MAILING ADDRESS: P.O. BOX 43118
ST. PAUL, MINNESOTA • 55164

Sample sent in by Grinchaw Drilling Co.
Town Sioux Falls, State S. Dak. Zip 57106 Date 21 Nov. 78
From well of #4A
Remarks: SIL = 25 ft. 400-600 gpm desired



U.S. SIEVE NO.	SLOT OPENING IN INCHES	U.S. SIEVE NO.	CUMULATIVE PER CENT RETAINED
6	.132	3.36	47-60
8	.094	2.38	5-20
12	.066	1.68	26
16	.047	1.19	37
20	.033	0.84	51
30	.023	0.60	66
40	.016	0.42	80
50	.012	0.30	93
70	.008	0.21	97
100	.006	0.15	

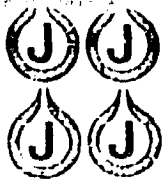
Notes: Gravel Rock with Silty Sand & Gravel
Company - #3/16 X 1/4

Recommended Slot Opening: No. 100 (0.100-inch)

Recommended Screen Dia 16 PS in. Length 8 Ft.

By: DCL

SO MANY CONSIDERATIONS ENTER INTO THE MAKING OF A GOOD WELL THAT, WHILE WE BELIEVE SLOT SIZES FURNISHED OR RECOMMENDED FROM SAND SAMPLES ARE CORRECT WE ASSUME NO RESPONSIBILITY FOR THE SUCCESSFUL OPERATION OF JOHNSON WELL SCREENS.



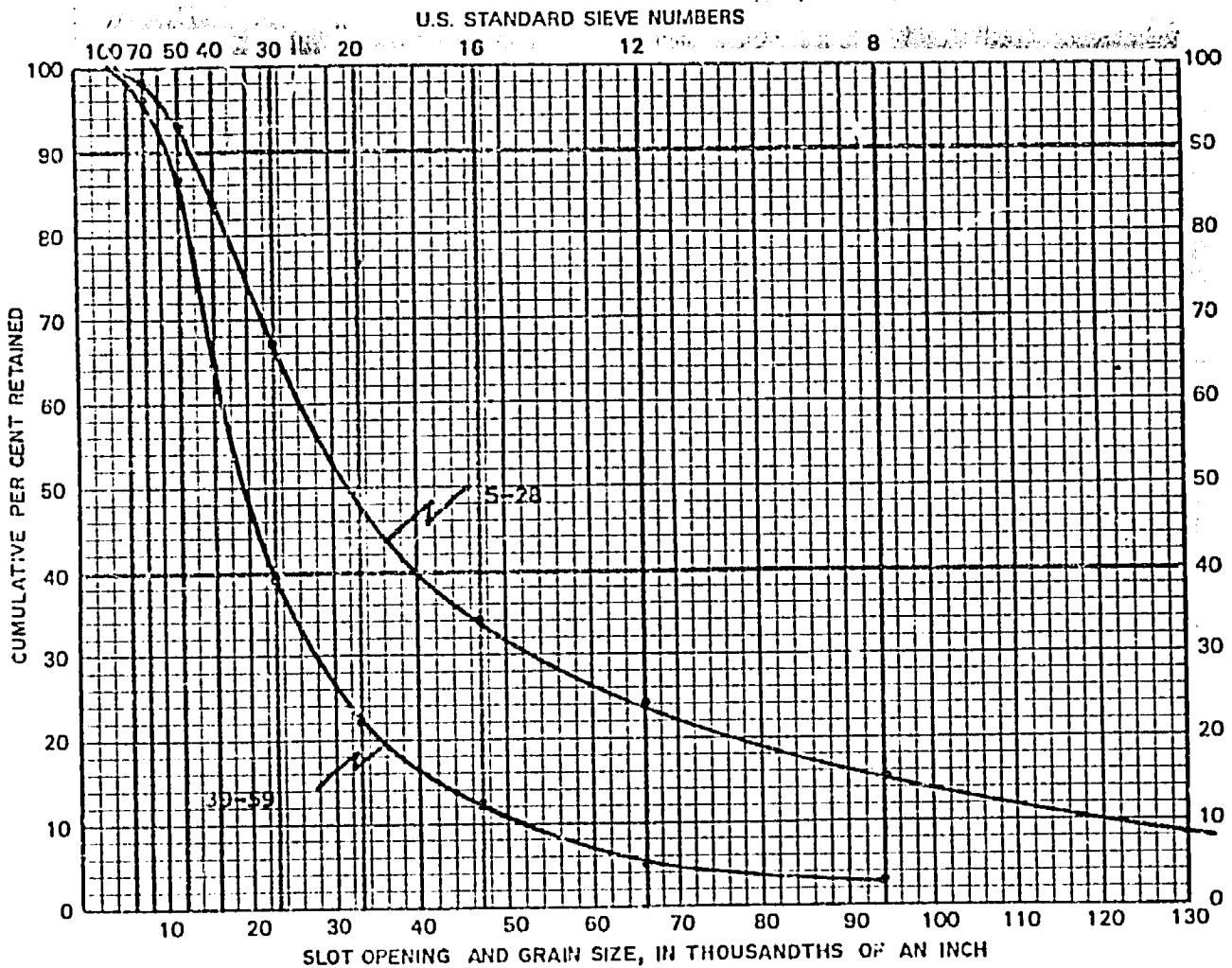
Johnson Division
P.O. Box 118 • St. Paul, Minnesota 55164
Telephone 612-636-3900 • Telex 29-7451
UOP Inc.

SAND ANALYSIS

(FINE)

MAILING ADDRESS: P.O. BOX 43118
ST. PAUL, MINNESOTA • 55164

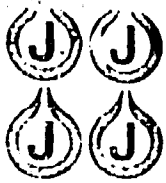
Sample sent in by Grinshaw Drilling Co.
Town Sioux Falls, State S. Dak. Zip 57106 Date 21 Nov. 78
From well of 25A
Remarks: _____



U.S. SIVL NO.	SLOT OPENING INCHES	IN MM	CUMULATIVE PERCENT RETAINED
6	.132	3.36	39-59
8	.094	2.38	5-28
12	.066	1.68	5
16	.047	1.19	12
20	.033	.84	22
30	.023	.60	39
40	.016	.42	64
50	.012	.30	86
70	.008	.21	96
100	.006	.15	

Notes: _____
Recommended Slot Opening: _____
Recommended Screen Dia _____ in. Length _____ Ft.
By: _____

SO MANY CONSIDERATIONS ENTER INTO THE MAKING OF A GOOD WELL THAT, WHILE WE BELIEVE SLOT SIZES FURNISHED OR RECOMMENDED FROM SAND SAMPLES ARE CORRECT WE ASSUME NO RESPONSIBILITY FOR THE SUCCESSFUL OPERATION OF JOHNSON WELL SCREENS.



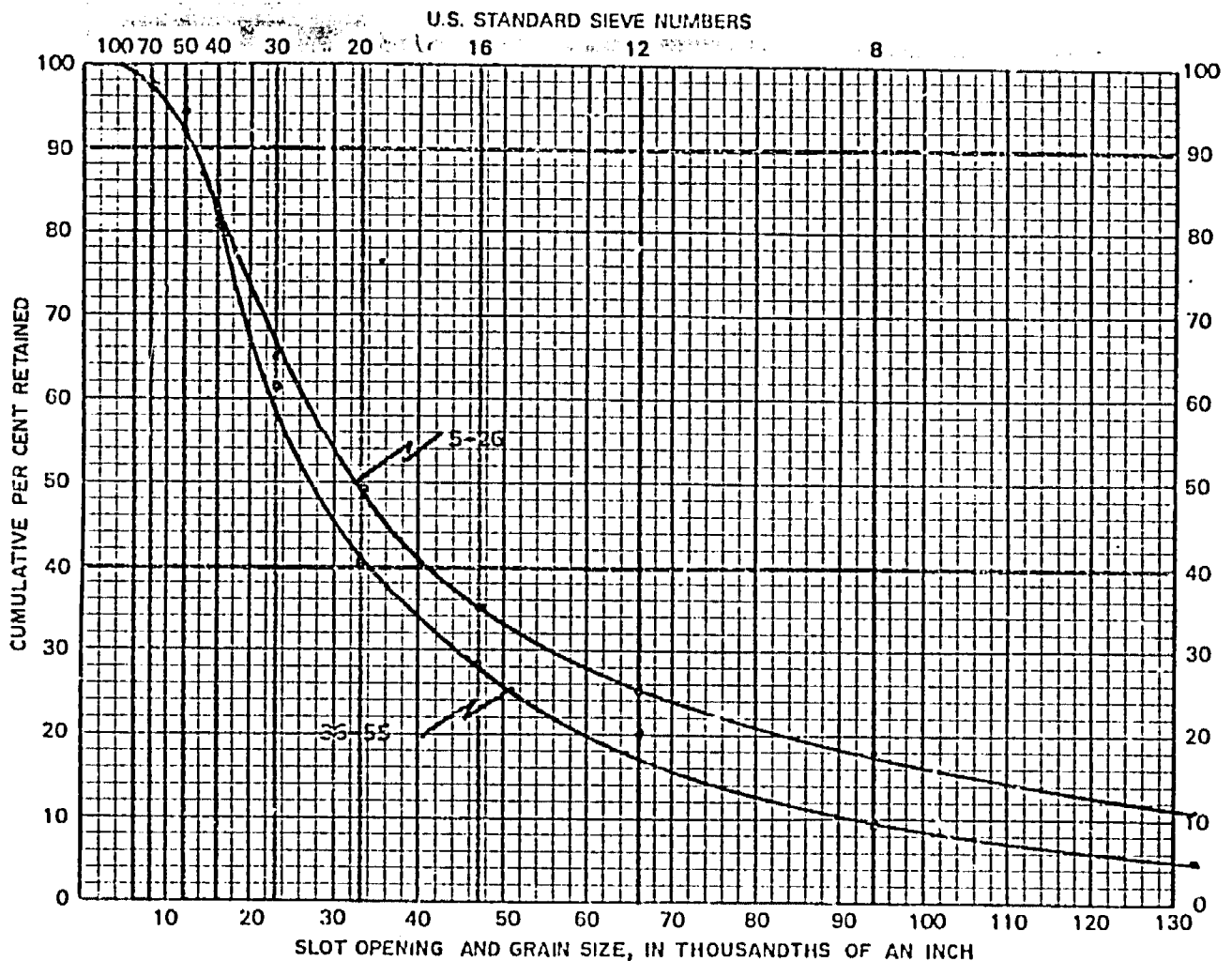
Johnson Division
P.O. Box 418 • St. Paul, Minnesota 55164
Telephone 612-636-3900 • Telex 29-7451
UOP Inc.

SAND ANALYSIS

(FINE)

MAILING ADDRESS: P.O. BOX 43118
ST. PAUL, MINNESOTA • 55164

Sample taken in by Grishaw Drilling Co.
Town Sioux Falls, State S. Dak. Zip 57106 Date 21 Nov. 78
From well of 96A
Remarks: _____



U.S. SIEVE NO.	SEIVE OPENING INCHES	MM	CUMULATIVE % RETAINED	
6	.132	3.36	36-55	5-20
8	.084	2.38	9	18
12	.066	1.68	28	30
16	.047	1.19	40	41
20	.033	.84	61	65
30	.023	.60	82	81
40	.016	.42	94	92
50	.012	.30	97	98
70	.009	.21		
100	.006	.15		

Notes: _____

Recommended Slot Opening: _____

Recommended Screen: Dia. _____ in. Length _____ Ft.

By: _____

SO MANY CONSIDERATIONS ENTER INTO THE MAKING OF A GOOD WELL THAT, WHILE WE BELIEVE SLOT SIZES FURNISHED OR RECOMMENDED FROM SAND SAMPLES ARE CORRECT WE ASSUME NO RESPONSIBILITY FOR THE SUCCESSFUL OPERATION OF JOHNSON WELL SCREENS.

OBSERVATION WELL

Finished in deep grey sand

Screened

2nd Test on well

Screened in shallow red sand

DEWILD, GRANT, RECKERT & STEVENS
ENGINEERS & ARCHITECTS
ROCK RAPIDS, IOWA

Page 1 of

Screened in deep grey sand

WELL PUMPING TEST DATA SHEET

Irrigation
WellProject FLASBROOK R.I.D.S.Date Tested 1/10/79

Producing Well & Location

Observations By

Baker, C. E. L. P. E.

Drawdown Readings Made With Following

Depth 23'

Equipment

Aquifer

Construction Details 10" Johnson

Flow Measurement Equipment

32" x 48" steel casing63" steel casing

Pump Equipment

This Test Sheet Shows Drawdown Measurements of (Producing Well) (Observation Well No.).

Length of Airline

Location & Description of Observation Well

Test Well #1 #2 #3 12" well

Time	Elapsed Time Min.	Piez. Reading (Inches)	Flow G.P.M.	Alt. Gage Ft.	Feet to Water	Draw-down	Remarks
3:00		27'8"	27'10"	32'11"	29'8"	22'4"	
3:01	1	55'3"					
3:03	3		32'10"				600 gpm
3:07	7	55'11"					
3:12	12		33'7"				
3:20	20			32'8"			
3:27	27	56'3"					
3:30	30		33'11"				
3:35	35	56'1"					
3:40	40			33'2"			
3:41	41		34'4"				
3:44	44	56'10"					
3:45	45		34'5"				
3:51	51	56'11"					
4:00	60	57'4"					
4:07	67		34'8"				
7:05	245		34'15"				
7:10	255			35'32"			
7:12	267	57'3"					
10:03	423		35'4"				
10:06	426	57'4"					
10:04	424			34'1"			
1:30	630	57'11"					
1:33	633		35'4"				
1:36	636			34'12"			
5:04	844	58'8"					
5:07	851		35'4"				
5:10	854			34'2"			

PUMP - 2000
WELL - 12"

9.00

2.0 Test on well

DEWILD, GRANT, RECKERT & STEVENS
ENGINEERS & ARCHITECTS
ROCK RAPIDS, IOWA

Page 2 of

WELL PUMPING TEST DATA SHEET

Project King Brock RWS Date Tested 1/11/79
Producing Well & Location Basin Test well Observations By
Depth Drawdown Readings Made With Following
Caulther Equipment
Construction Details Flow Measurement Equipment
Pump Equipment This Test Sheet Shows Drawdown Measure-
ments of (Producing Well) (Observatio.
Well No.).
Length of Airline Location & Description of Observation
Well

Test well #1 #2 #3 17.11.79

Time	Elapsed Time Min.	Piez. Reading (Inches)	Flow G.P.M.	Alt. Gage Ft.	Feet to Water	Draw-down	Remarks
7:54	1085	59'5"	35'5"	7			600' down
8:58	1092		35'5"				600' down
9:00	1099			34'5"			600' down
9:10	1109				29'8"		600' down
9:25	1109					22'4"	600' down
10:02	1276	59'6"					600' down
12:05	1279		35'5"				600' down
13:08	1282			34'3"			600' down
3:05	1459	60'0"					580' out return
3:09	1463		35'6"				to 600' down below
3:12	1466			34'4"			test in 600'
3:17	1471				29'5"		100' 1"
3:22	1476					22'5"	600' down
7:10	1707	60'6"					600' down
17:13	1710		35'2"				11' 1"
21:15	1712			34'5"			11' 1"
10:53	1935	60'9"					11' 1"
10:55	1939		35'2"				11' 1"
11:20	1992			34'5"			11' 1"
3:10	2192	61'1"					11' 1"
3:17	2196		35'8"				11' 1"
3:17	2199			34'6"			11' 1"
5:00	2432	61'3"					11' 1"
5:04	2486		35'5"				11' 1"
5:07	2489			34'6"			11' 1"
5:15	2497				29'8"		11' 1"
5:20	2502					22'5"	11' 1"
11:15	2737	61'1"					11' 1"

2nd Test - Well

DEWILD, GRANT, RECHERT & STEVENS
ENGINEERS & ARCHITECTS
ROCK RAPIDS, IOWA

Page 3 of

WELL PUMPING TEST DATA SHEET

Project KINGBROOK R.W.S. Date Tested 1/12 + 13
Producing Well & location BROWN TEST WELL Observations By
Depth Drawdown Readings Made With Following
Aquifer Equipment
Construction Details Flow Measurement Equipment
Pump Equipment This Test Sheet Shows Drawdown Measure-
ments of (Producing Well) (Observation
Well No.).
Length of Airline Location & Description of Observation
Well

TW #1 #2 #3 17' 11" 17' 11" 17' 11"

Time	Elapsed Time Min.	Piez. Reading (Inches)	Flow G.P.M.	Alt. Gage Ft.	Feet to Water	Draw-down	Remarks
12:18	2740		35' 3"	7			600 g.p.m.
12:21	2743			34' 6 1/2"			"
12:22	2772	61' 1"					"
12:23	2775		25' 5"				"
12:24	2779			24' 6 1/2"			"
12:25	3012	61' 1"					"
12:26	3017		33' 8"				"
12:27	3020			24' 7"			"
12:28	3573	61' 1"					"
12:29	3576		35' 8"				"
12:30	3579			34' 7"			"
12:31	3909	61' 1"					"
12:32	3912		35' 8"				"
12:33	3915			34' 2 1/2"			"
12:34	3927			29' 8"			"
12:35	3932				32' 5"		"
12:36	1	31' 6"					"
12:37	2		31' 3"				"
12:38	5			31' 11"			"
12:39	11	30' 8"					"
12:40	13		30' 9"				"
12:41	15			31' 0"			"
12:42	20	29' 8"					"
12:43	22		29' 5"				"
12:44	24			30' 2"			"
12:45	25	29' 4"					"
12:46	27		29' 5"				"
12:47	40			30' 5"			"

1/12

SAT. AM
1/13

Recovery 110
1st 2 1/2 hrs.

Test on Well

7 PM - 10
SAM - 20

DEWILD, GRANT, RECKERT & STEVENS
ENGINEERS & ARCHITECTS
ROCK RAPIDS, IOWA

Page *14* of *14*

WELL PUMPING TEST DATA SHEET

Project _____ Date Tested _____
 Producing Well & Location _____ Observations By _____
 Depth _____ Drawdown Readings Made With Following
 Aquifer _____ Equipment _____
 Construction Details _____ Flow Measurement Equipment _____
 Pump Equipment _____ This Test Sheet Shows Drawdown Measure-
 ments of (Producing Well) (Observation
 Well No. _____).
 Length of Airline _____ Location & Description of Observation
 Well _____

<i>11/15/10</i>	<i>9:40</i>	<i>50</i>	<i>28' 10"</i>		
	<i>9:41</i>	<i>51</i>	<i>29' 5"</i>	<i>0</i>	
<i>11/15/10</i>	<i>9:43</i>	<i>53</i>		<i>3' 2"</i>	
	<i>9:46</i>	<i>190</i>	<i>28' 6"</i>		
<i>11/15/10</i>	<i>12:03</i>	<i>193</i>	<i>28' 8 1/2"</i>		
	<i>12:05</i>	<i>195</i>		<i>29' 10"</i>	
<i>11/15/10</i>	<i>5:20</i>	<i>510</i>	<i>28' 2 1/4"</i>		
	<i>5:23</i>	<i>513</i>		<i>29' 2 1/2"</i>	
<i>11/15/10</i>	<i>5:26</i>	<i>516</i>	<i>28' 4"</i>		
	<i>10:30</i>	<i>930</i>	<i>27' 8"</i>		
<i>11/15/10</i>	<i>10:34</i>	<i>934</i>	<i>27' 10"</i>		
	<i>10:37</i>	<i>937</i>		<i>28' 11 1/2"</i>	
<i>11/15/10</i>	<i>10:38</i>	<i>943</i>		<i>29' 5"</i>	
	<i>10:45</i>	<i>945</i>			<i>29' 4"</i>

Line 1011

Example 1011

1 2 3 4 5 6 7 8 9 10

Brown Test

(Test 1011 No. 2)

Kingdon 1 Q10

$Q = 600,000$
 $r = 1.25$

Indication

10-10-10

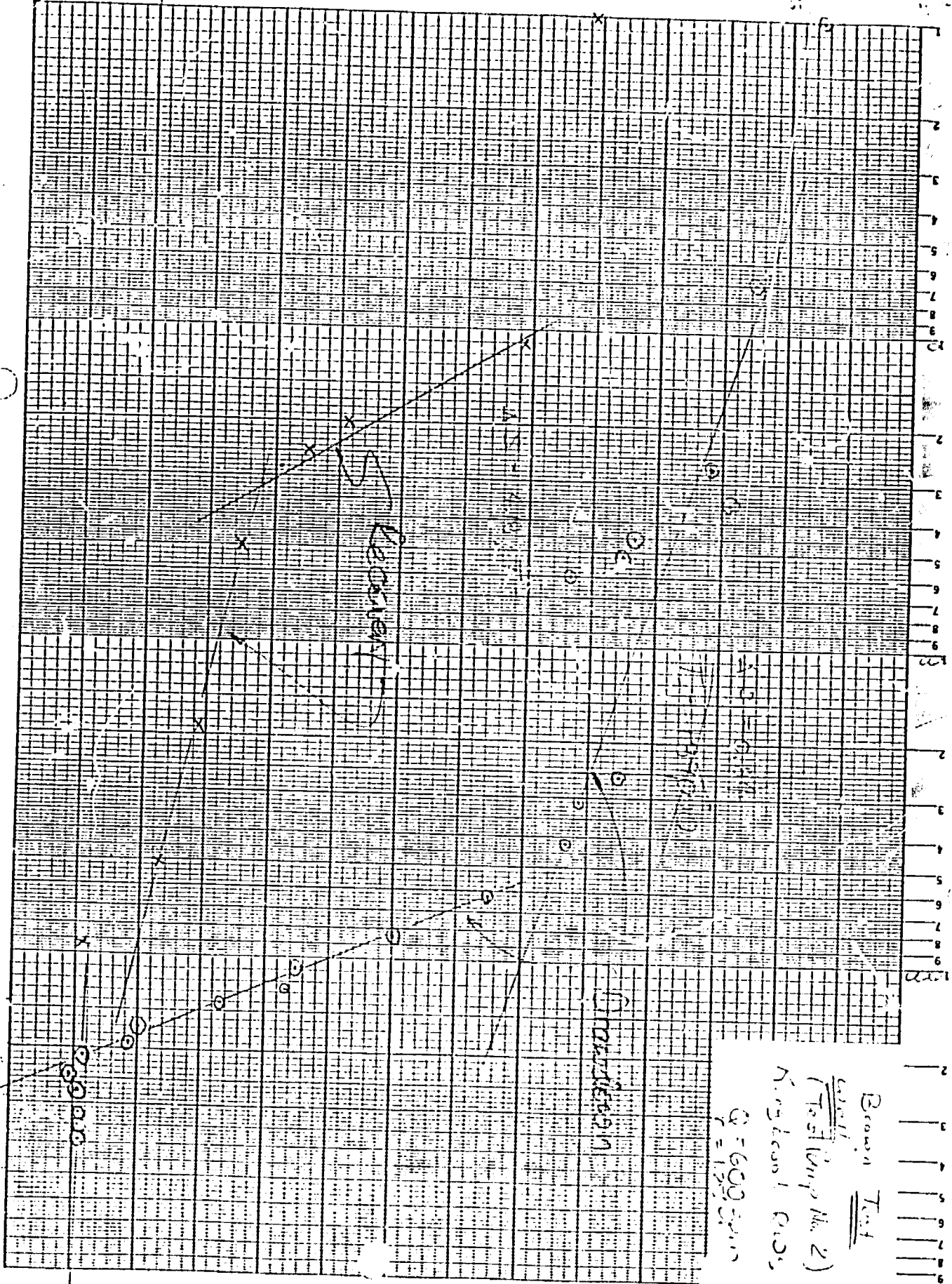
10-10-10

10-10-10

10-10-10

10-10-10

10-10-10



1

4
3
6
12

Brooklyn, N.Y.

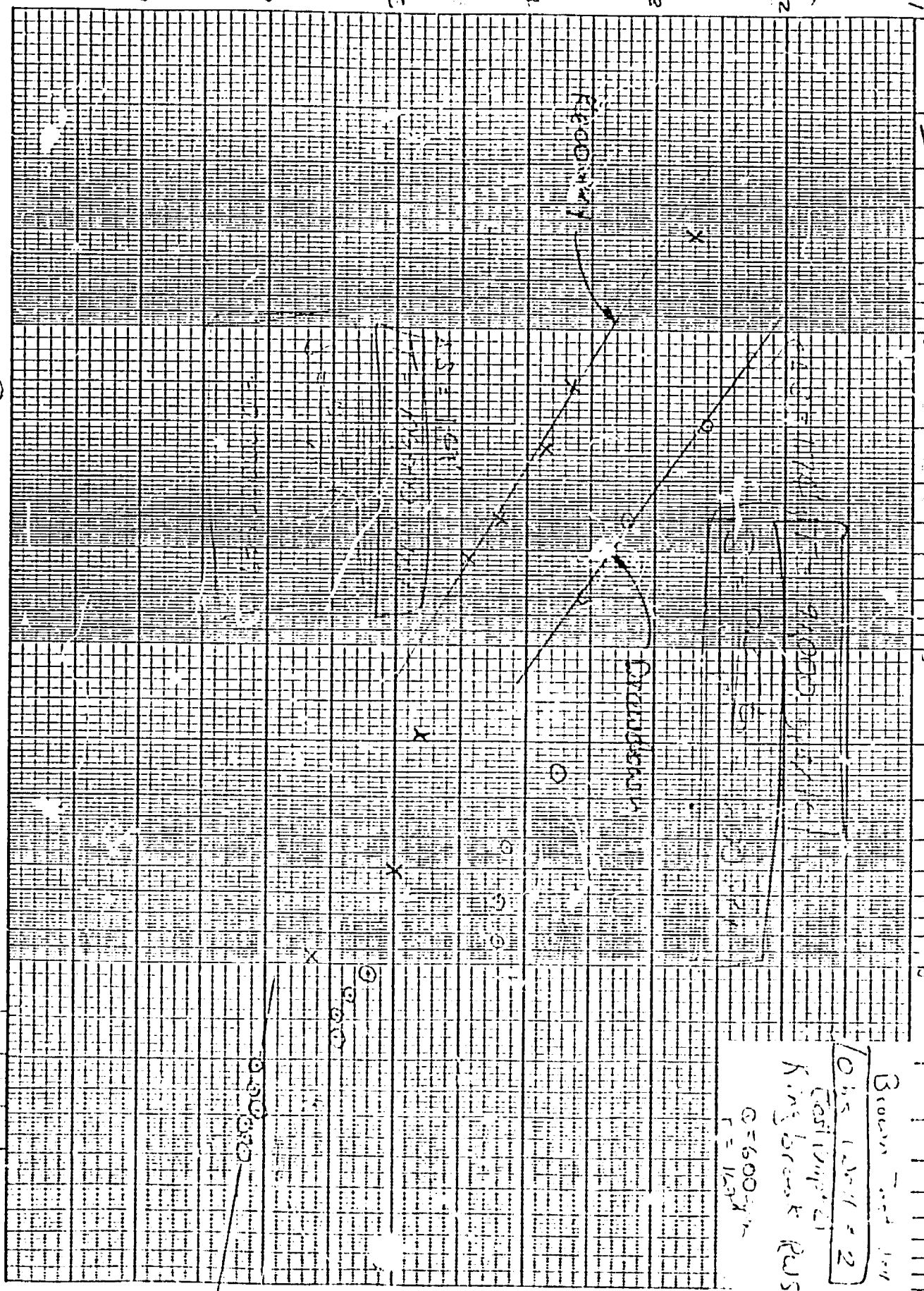
Obs 1231 = 2

Kingbrook Rd

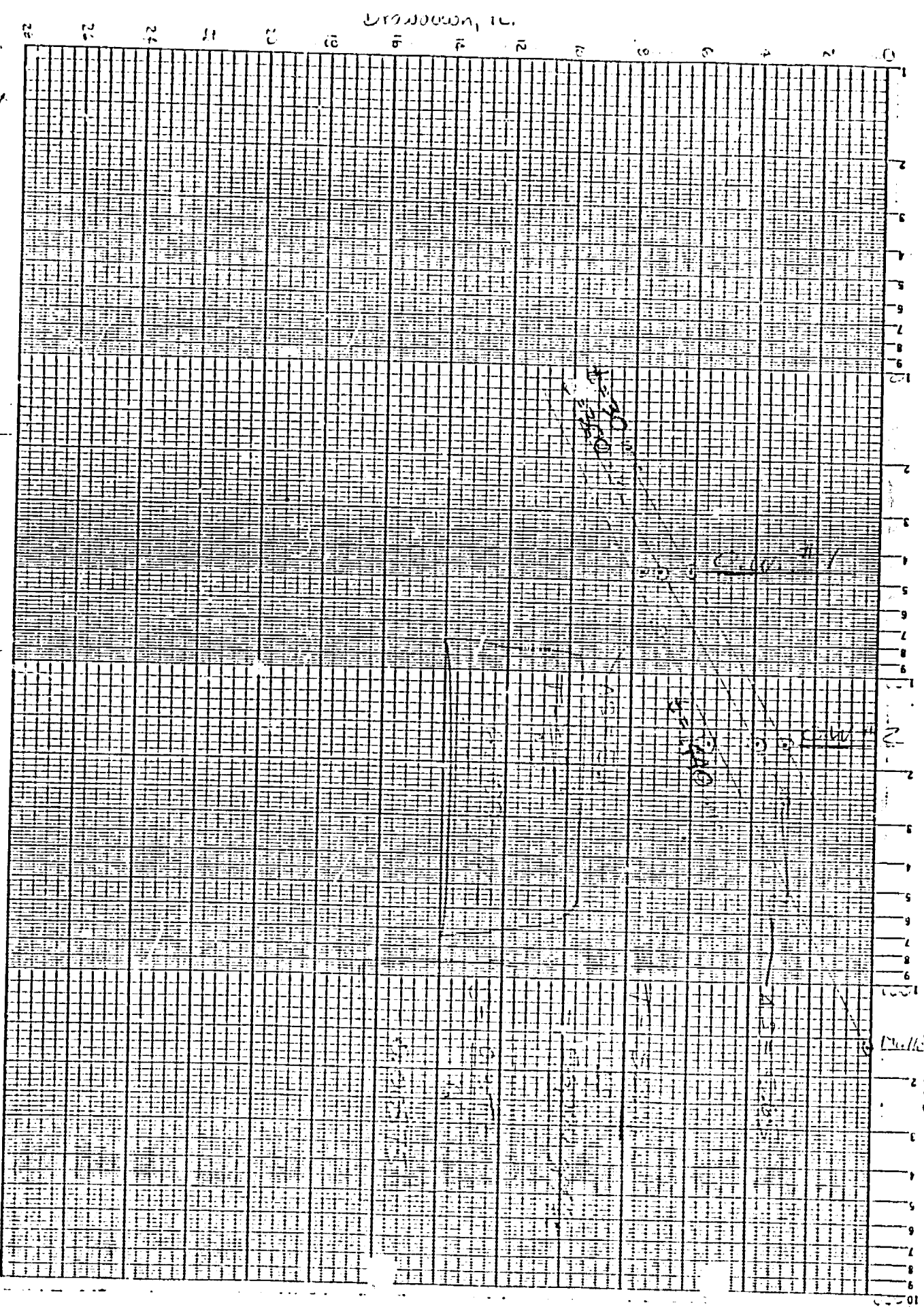
$\phi = 600 - 7 = 593$

$$x^2 - 1 = (x-1)(x+1)$$

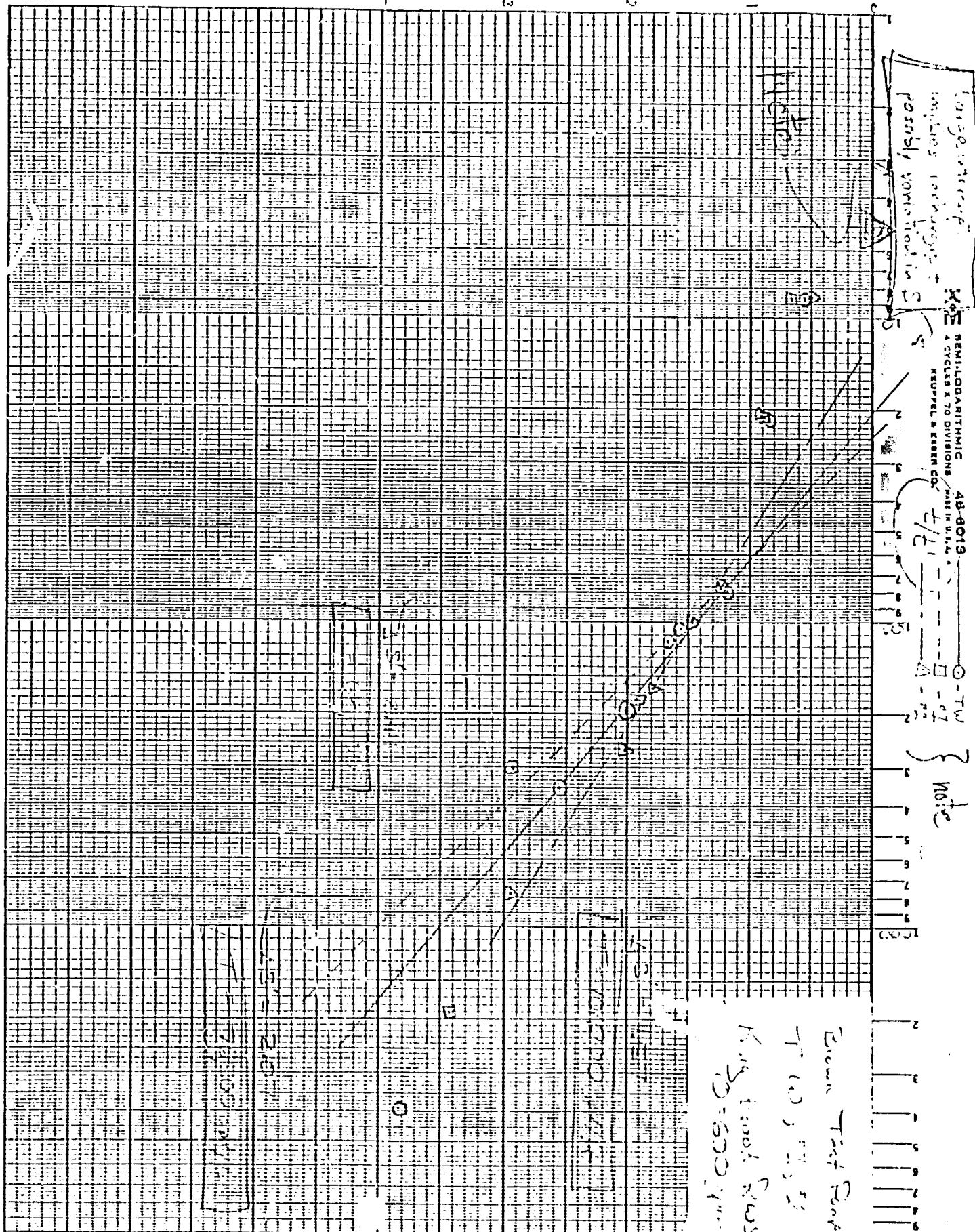
Drafting or Locating, &



Breakfast 10:00, Post-Ten 11:20
Lunch 12:00, Dinner 6:00, Bed 10:00



RESIDUAL STANDARD



Large scale
includes 100 divisions
possibly variation in 10

REMI-LOGARITHMIC 48-8013
4 CYCLES X 70 DIVISIONS
KUPPERS & EBER CO. MADE IN U.S.A.

4/7

note

Even Time Scale = 2
Time Scale = 10
Kuppers & Eber
100-600 ym

46 6013
MADE IN U.S.A.

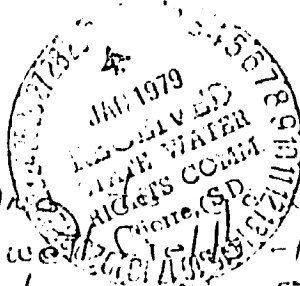
1971-1972 Accounting 1-10-2000

$$\begin{array}{r} 1-197.000 \\ 2-00000 \\ \hline 1-197.000 \end{array}$$

London, E.

Water Rights Comm.
Betty Westlund
Water Rights Specialist

Chester, S.D.
1-25-79



I'm writing you because of my concern of the water rights that Kingsbrook Rural Water is developing in Sec. 17 & 8. This concerns me because I have two center pivots in Sec. 15, about 1 1/2 miles from these wells. You know what I have invested besides with the very thick population of corn if we couldn't irrigate when we need it we would also lose our crops. Maybe, and I hope there is enough water in our aquifer, but do we know when we are all pumping. Lets not wait until someone gets financially hurt and then start deferring the permits. Have you studied this application and the aquifer in this area?

I attended the Kingsbrook Rural Water formation meeting in Madison. This is a very large area that these wells will bring water to, but I doubt that there is ~~is~~ six farms in Chester Twp. that this system will serve. On their map ~~there~~ ~~map~~ it didn't even show where the wells were because they are east of Phase III. This bothers me because I can't see where it is going to do our town or area any good besides eliminating some of our land that has irrigation potential and also jeopardize our wells.

I'm not using the word protest but I am concerned so please study it and be sure.

Rt #1, Box 15
Chester, SD 57016

Sincerely
Charles Coleman

DeWitt Grant Reckert & Associates Co.
Architectural Engineering and Planning

315 First Avenue
Rock Rapids, Iowa 51246
Telephone 712 472 2531

600 South C. Ave. East Pierre, SD
Pierre, SD 57501
Telephone 605 777 3042

3801 National Bank Bldg
Pierre, SD 57502
Telephone 605 777 3117

15 January 1979

Water Rights Commission
Department of Natural Resource Development
Joe Foss Building
Pierre, South Dakota 57501

Attention: Mr. John Hatch

Re: Kingbrook Rural Water System, Phase 3
DGR File No. 24208

Dear Mr. Hatch:

This is to confirm and supplement the handwritten note I sent you on January 11, 1979, regarding design information on the above referenced project. As shown on the pipeline map I sent you on the 11th, the north end of Phase 3 will be supplied with water from the well field north of DeSmet, installed when Phase 2 was constructed last year. The southern part of Phase 3 will be served from the well field near Chester. The following information summarizes final design criteria for Phase 3.

Total number of connections	808
Connections served from DeSmet well field	130
Towns served from DeSmet well field	Oldham
Connections served from Chester well field	678
Towns served from Chester well field	None
Peak day water demand from Chester well field	531,000 gpd
Average day water demand from Chester well field	400,000 gpd =
Design W.T.P. capacity at Chester well field (16-hr. peak day demand)	280 gpm
Construct 2 wells, each to pump at approx. 550 gpm. Alternate pumping well with each treatment cycle.	Approx. 550 gpm

As per your written request to Kingbrook for a copy of the feasibility report, we enclose one (1) copy of the Final Engineering Feasibility Study and Report for Phases 3 and 4, dated April, 1977. Bound in the back of the report is an addendum issued February 3, 1978, which revised cost estimates to reflect a change in system boundaries. Since issuance of the Addendum, Phases 3 and 4 have been combined into Phase 3 and several communities declined service from the rural water system.

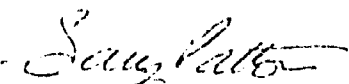


Water Rights Commission
15 January 1979
Page Two

Please contact me if you need any further information regarding this project.

Very truly yours,

DEWILD GRANT RECKERT
& ASSOCIATES COMPANY


Gary Patton

GP:mjk
Enclosure

cc: Alec Vedvej
Kingbrook Rural Water System

Water Rights Commission
Dept. of Natural Resource Development
Joe Foss Building
Pierre, South Dakota 57501
Attn: Mr. John Hatch

Re: Kingsbrook Rural Water System
DGR File No. 24-208



Dear Mr. Hatch:

Please excuse the handwritten note, but I couldn't get a typewritten letter out in today's mail. The enclosed maps show the area to be served by the Kingsbrook Phase 3 system, the pipelines and the well field, water plant and reservoir locations. As shown in the drawings, the north end of Phase 3 will be supplied with water from the well field north of DeSmet. The southern part of Phase 3 will be served from the well field near Chester. The following information summarizes design criteria for Phase 3.

Total number of connections	808
Connections served from DeSmet well field (Phase 2)	130, plus town of Odessa
Connections served from Chester well field	678 (in towns)
Peak day water demand from Chester well field	531,000 gpd

Average day water demand (ultimate)
from Chester well field 400,000 gpd
..... 280 gpm

Design water treatment plant capacity
at Chester well field (16-hr peak day
demand) approx. 550 gpm

Construct 2 wells, each of which to
pump at approx. 550 gpm. Use
Alternate well called for each time
treatment cycle is run.

I will have this letter typed and sent to you for
your permanent record tomorrow. Please let
me know if you need any additional information
on the Phase 3 design.

Sincerely,

Grant Patton

Grant Patton

DeWild Grant Peckert & Assoc. Co.

L. F. ERICSSON
ROBERT R. SPENCER
RICHARD L. ERICSSON

ERICSSON, SPENCER & ERICSSON
ATTORNEYS AT LAW
P. O. BOX 406
MADISON, SOUTH DAKOTA 57042

AREA CODE 605
PHONE 256-4597
104 EAST CENTER STREET

January 24, 1979



Water Rights Commission
State Capitol
Pierre, South Dakota 57501

RE: Application - Kingbrook Rural Water System, Inc.
in Lake County; Hearing January 31, 1979

Attn: Ms. Betty Westlund
Water Rights Specialist

Dear Ms. Westlund:

Today I was approached by several clients in the Chester Township area of Lake County in reference to the hearing on the application of Kingbrook Rural Water System, Inc. for two (2) wells in Chester Township, such hearing to be held at Pierre on the 31st day of January, 1979, at 10 A.M. in the SDEA auditorium. The application asks for one well on the Southeast Quarter of the Northeast Quarter (SE $\frac{1}{4}$ NE $\frac{1}{4}$) of Section 8, and the other on the Northeast Quarter of the Northeast Quarter (NE $\frac{1}{4}$ NE $\frac{1}{4}$) of Section 17, both in Chester Township, being Township 105, North of Range 51, West of the 5th P.M. in Lake County.

The parties whom I represent are Charles Alverson in Section 15, Ronald and Larry Alverson in Section 16, Dennis Brown in Section 18, William Mueller in Section 8, Dale Bunkers in Section 23, Lester Anderson in Section 30, and with his brother, William Anderson, have an irrigation well on the East Chester Township line just over into Moody County. These parties have operating irrigating systems on their properties and have water right permits granted to them for that purpose. Their concern is that this large usage of water by Kingbrook Rural Water System, Inc. may deplete the water too drastically so that not sufficient water will be available for their irrigation needs in that immediate area, all of this being within a mile or less, and not over five miles from either one of the wells in question.

There is also concern felt by these parties in reference to the water supply to the Chester Sanitary District which provides water for the unincorporated town of Chester, which is just a little over two miles from either of the two wells which are proposed.

The concern of these parties is not to oppose the granting of the

Page 2
Water Rights Commission
January 24, 1979

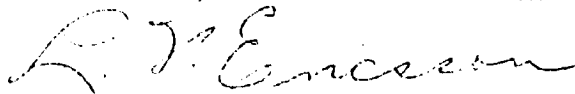
permit if there is an adequate determination that the supply of water is sufficient for their usage, which has already been approved, as well as the proposed two wells of the water system. We hope that at the hearing you will give this matter due and serious consideration.

Inasmuch as I will be unable to be present at the hearing in person, I am sending a copy of this letter to Representative J. B. Lammers requesting that he be present for the hearing on our behalf. He is the attorney for the Chester Sanitary District, and I presume that he will be there to represent them, but I am asking him to attend the hearing on our behalf as well.

Thanking you for your courtesy and consideration of the above, I am

Very truly yours,

ERICSSON, SPENCER & ERICSSON


L. F. Ericsson

LFE:so

cc: Rep. J. B. Lammers
Charles Alverson

LAMMERS, LAMMERS, KLEIBACKER & CASEY
LAWYERS

106 North Egan - P. O. Box 264
MADISON, SOUTH DAKOTA 57042

J. H. LAMMERS
JEROME B. LAMMERS
WILSON M. KLEIBACKER
RICHARD D. CASEY

216 6677
AREA CODE 605

January 30, 1979

South Dakota Water Rights Commission
State Capitol
Pierre, South Dakota 57501

Gentlemen:

Re: Chester Sanitary District

Please be advised that our office represents the Chester Sanitary District of Chester, South Dakota. The Chester Sanitary District provides the domestic water supply for the City of Chester, which is located in southeastern Lake County, South Dakota. The Chester Sanitary District maintains a well which is their only source of water.

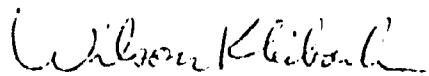
It is my understanding that the Kingsbrook Rural Water System has made application to the Water Rights Commission for permission to drill two wells which will be located approximately three miles from the Chester Sanitary District's well. The Chester Sanitary District is concerned that the Kingsbrook Rural Water System wells will affect their water table and their source of water.

We would like to go on record as requesting an interference clause showing the priority of the domestic water supply for the Chester Sanitary District over the Kingsbrook Rural Water System's wells, and we would ask that this be included in the permit given to the Kingsbrook Rural Water System.

Your kind attention to this request would be greatly appreciated. Thank you.

Yours very truly,

LAMMERS, LAMMERS, KLEIBACKER & CASEY



By: Wilson Kleibacker

WK/dr

cc: Kenneth Krumm

Received - January 31, 1979
W.M.

4367-3

Department of Natural Resource Development

WATER RIGHTS COMMISSION

Jon Foss Building, Pierre, South Dakota 57501

Phone 605/224-3151

February 9, 1979

Rep. J. D. Lammers
108 North Egan
P. O. Box 284
Madison SD 57042

Dear Representative Lammers:

The Water Rights Commission at its meeting January 31, and February 1, 1979, approved Application No. 4367-3 for 3.0 cfs from groundwater (2 wells) in Lake County with the following qualifications:

The wells approved under this Permit will be located near domestic wells and irrigation 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 other wells having prior water rights.

South Dakota Statutes provide that this decision by the Commission may be appealed to the courts.

Very truly yours,

JOHN HATCH, Chief Engineer
Water Rights Commission

JH:kjw

cc



FINAL
ENGINEERING REPORT AND FEASIBILITY STUDY
FOR
PHASE 3 AND 4
KINGBROOK RURAL WATER SYSTEM, INC.
ARLINGTON, SOUTH DAKOTA



I hereby certify that this report was prepared by me or under my direct personal supervision and that I am a Registered Professional Engineer in the State of South Dakota.

By *John M. Madden*
John M. Madden, South Dakota
Professional Engineer #1787

Date 5-9-77

FINAL
ENGINEERING REPORT AND FEASIBILITY STUDY
FOR
PHASE 3 AND 4
KINGBROOK RURAL WATER SYSTEM, INC.
ARLINGTON, SOUTH DAKOTA

PREFACE

The enclosed final feasibility study of Phases 3 and 4 of the Kingbrook Rural Water System was preceded by a similar report for Phase 1 and that report is dated September 29, 1975.

Bids were received on December 8, 1976 for construction contracts on Phase 1 of the system and that portion is now under construction.

Section XI of this report provides a statistical and financial summary of Phases 1 thru 4. Construction cost estimates are based on the contracted costs for Phase 1, on April 1977 estimate for Phase 2, and the enclosed estimates of Phases 3 and 4.

The Kingbrook Rural Water system is not planning additional major phases of construction at this time.

FINAL
ENGINEERING REPORT AND FEASIBILITY STUDY
FOR PHASE 3 AND 4
KINGBROOK RURAL WATER SYSTEM, INC.
ARLINGTON, SOUTH DAKOTA

1977

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DEWILD, GRANT, RECKERT & ASSOCIATES CO.

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KINGBROOK RURAL WATER SYSTEM, INC.

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Ramona, South Dakota

DeSmet, South Dakota

Volga, South Dakota

FINAL
ENGINEERING REPORT AND FEASIBILITY STUDY
FOR
PHASE 3 AND 4
KINGBROOK RURAL WATER SYSTEM, INC.

ARLINGTON, SOUTH DAKOTA

I. GENERAL INFORMATION

The geographical area included in this study encompasses a portion of southeast Kingsbury County, the east half of Miner County, the west half of Lake County, and six townships in northeastern McCook County. The prepared maps included with this report include a total north-south distance of about 42 miles and a total east-west distance of about 35 miles.

The terrain is characterized as gently rolling to relatively flat. Mean Sea Level elevations range from 1520 to 1670 on the East Fork Vermillion River and from 1475 to 1600 on the West Fork Vermillion River to from 1700 to 1800 at the higher elevations along the east edge of the system. The other major terrain feature is the many shallow prairie lakes located throughout the area. The major lakes are Thompson and Whitewood on the north, and Herman in the east-central area.

The average annual precipitation is 22 to 24 inches with approximately 17 inches received during the 125-135 day growing season. Weather records indicate that the daily minimum temperature will be less than 0 degrees F. on 35 to 40 days per year and temperatures in excess of 90 degrees F. occur on about 25 days per year. Data for Brookings indicate a record low temperature of minus 41 degrees F. and a record high temperature of 109 degrees F.

The proposed system is generally bounded by South Dakota Highway 81 north of Madison and Highway 19 south of Madison on the east, South Dakota highway 38 on the south, South Dakota Highway 25 on the west, and South Dakota Highway 14 on the north.

The Kingbrook Steering Committee and Board of Directors have conducted a mail and personal contact survey of the project area and have collected a two hundred fifty dollar (\$250.00) final hook-up fees from these persons interested in con-

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tributing toward the development of a rural water system. They have also solicited good-intention fee contributions from those Towns and Cities that desire to be considered as wholesale customers of the system.

At the time of this report we have received requests to provide service to 889 retail locations within the study area. Of these locations, 86 are located beyond what is currently considered to be the feasible limits of the system. The following distribution is provided for the 803 locations within the feasible limits of the system:

Retail Farm Users	721
Pasture Taps	30
Retail Lake Cottages and Residences	36
Retail Users within Small Towns	16

In addition to the rural users the proposed system may serve the Cities and Towns of Howard, Oldham, Winfred, and Ramona on a wholesale basis.

At the end of this report the proposed system has been separated into two phases for funding and construction purposes. A cost estimate has been made for each. The phases have been numbered three and four. We are not indicating the order in which the phases must be funded and constructed, because a common water supply will be used. Additional groundwater exploration will be required to locate the water source for the two phases.

In addition to the cost estimates for each phase an additional summary is provided for each phase with the low density areas deleted. Additional estimates are also provided to show the cost of serving wholesale users.

The total project cost is estimated to be \$4,355,000 of which \$112,439.00 is the approximate additional project cost to serve the wholesale users of Howard, Oldham, Ramona and Winfred. For the rural area the estimated total project cost per retail user is \$5,285.

The calculations contained in the data sections of this report are based on the original interested subscribers and may be subject to alteration between the date of this report and the start of final design.

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As tabulated from the final water use survey sheets, the following numbers of people, livestock and poultry will be served by the rural area portion proposed system:

People and Livestock Served

People (Retail Customers)	2,524
People (Wholesale Customers)	1,756
Dairy Cows	3,610
Feeder Cattle	39,885
Stock Cows	81,285
Hogs and Sheep	45,440
Poultry	27,250

Based on Federal and State standards, public water supplies in the area are somewhat below standard. Existing sources are currently being used because better supplies have not been developed or do not exist in the immediate vicinity. A good rural water system will bring priceless benefits; health, sanitation, modern conveniences, and an economic impact by way of increased property values, increased livestock numbers and home improvements.

II. WATER SUPPLY

It is proposed that the system consider obtaining water from one (1) potential source. The source would be located at two (2) potential locations in the East Fork of the Vermillion River Aquifer. The source is more closely defined as follows:

1. East Fork Vermillion River - Winfred Area: This source would serve as the primary water supply for Phases 3 and 4. Preliminary information indicates that sufficient quantity of water is available to meet the needs of the two phases. The water quality could range from 15 to 40 grains/gallon hardness, from 400 to 1,500 ppm total dissolved solids and is likely to require iron and manganese removal.

Additional groundwater investigation is required to determine the available quality and quantity of water at the East Fork Vermillion River Aquifer. It is our understanding that the South Dakota Geological Survey will conduct preliminary investigation in this area during the summer of 1977. Actual well site selection and test pumping the the Kingbrook system is planned to follow their efforts.

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With previous rural water systems it has been a policy for the South Dakota Geological Survey and the East Dakota Conservancy Sub-district to share in the cost of water exploration. We have assumed that a request will be made for assistance and that the necessary technical and financial assistance required to evaluate the two (2) locations on the Vermillion will be made available.

III. MAINLINE DISTRIBUTION SYSTEM

Two alternatives have been considered for mainline distribution and location of wells, ground storage reservoirs and booster stations. The alternatives are more closely defined as follows:

1. Alternative One: (See Figure 1)

Generally Alternative One is considered to be more feasible due to lower construction cost. The wells and main control building for Alternative One would be located one mile south and 2 miles east of Winfred. It is proposed that the water source be located in this area because of the greater concentration of users in this area. With the wells located in this area the system could ultimately reduce the pumping distance to serve a majority of the users. Alternative One would require a ground storage reservoir to be located approximately two miles west and two miles south of Ramona; a ground storage reservoir to be located approximately six miles south and three miles west of Madison and booster station located approximately seven miles north of Howard.

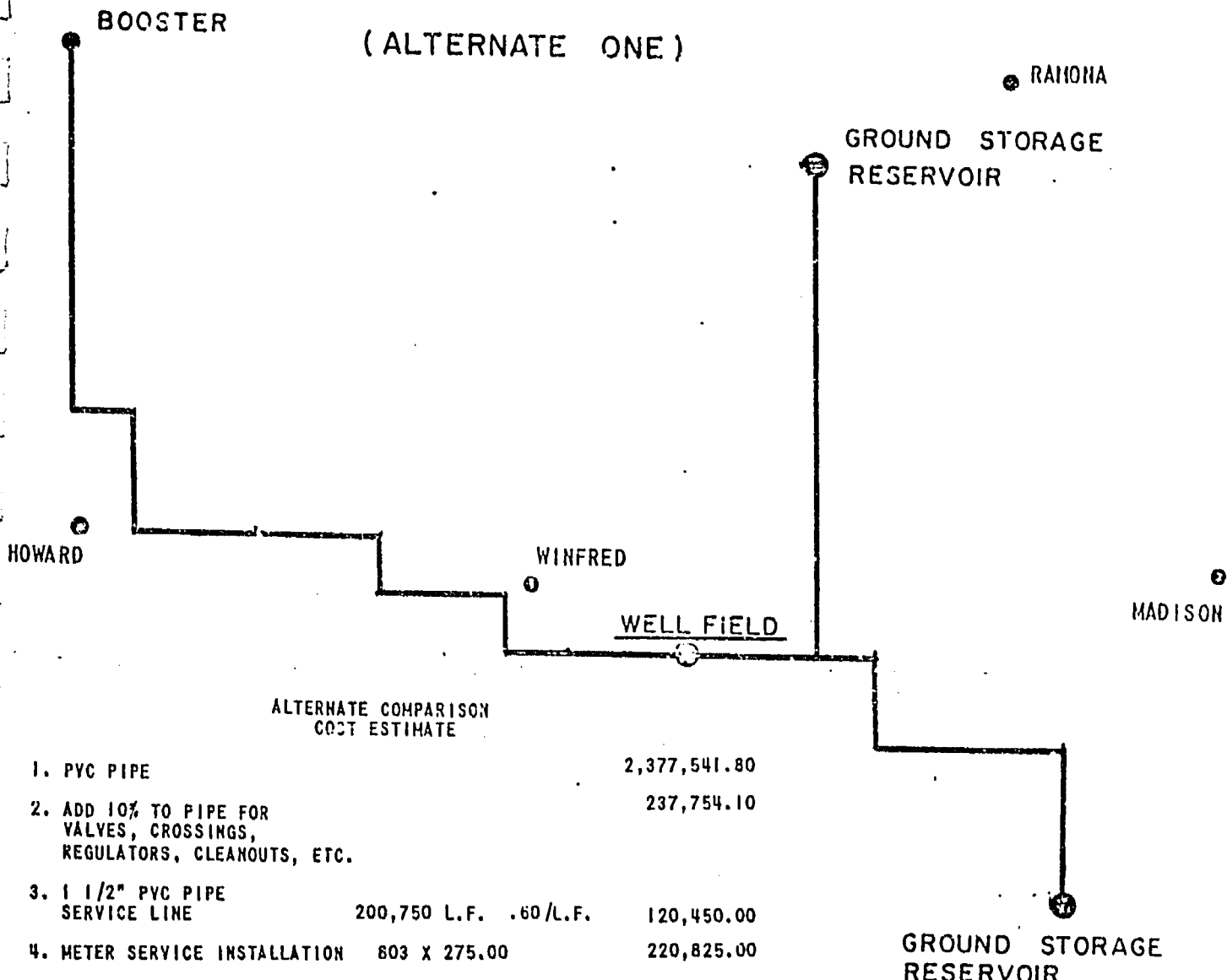
2. Alternative Two: (See Figure 2)

Alternative Two would require a ground storage reservoir located one mile west and one mile north of Julius. The water source for Alternative Two would be located eight miles north and one mile west of Winfred.

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MAINLINE DISTRIBUTION

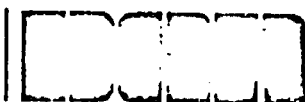
(ALTERNATE ONE)



ALTERNATE COMPARISON COST ESTIMATE

1. PVC PIPE		2,377,541.80
2. ADD 10% TO PIPE FOR VALVES, CROSSINGS, REGULATORS, CLEANOUTS, ETC.		237,754.10
3. 1 1/2" PVC PIPE SERVICE LINE	200,750 L.F. .60/L.F.	120,450.00
4. METER SERVICE INSTALLATION	803 X 275.00	220,825.00
5. BOOSTER STATION (1)		50,000.00
6. GROUND STORAGE RESERVOIRS (2)		200,000.00
7. MAIN CONTROL BUILDING		250,000.00
	TOTAL CONSTRUCTION	3,456,570.90
	PER USER	4,305.00

FIGURE 1



DeWild Grant Reckert & Associates Co.
Architecture Engineering Planning

Pack Road, Iowa
State City, Iowa
State City, Iowa

Date
Drawn By
Approved
Revised

KINGBROOK RURAL
WATER SYSTEM

PHASES 3 AND 4

MAINLINE DISTRIBUTION (ALTERNATE TWO)

● OLDHAM

WELL FIELD

● RAMONA

HOWARD

WINFRED

GROUND STORAGE
RESERVOIR

MADISON

ALTERNATE COMPARISON COST ESTIMATE

1. PVC PIPE			2,631,811.00
2. ADD 10% OF PIPE FOR VALVES, CROSSINGS, REGULATORS, CLEANOUTS, ETC.			263,181.10
3. 1 1/2" PVC PIPE SERVICE LINE	203,750 L.F.	.60/L.F.	203,750.00
4. METER SERVICE INSTALLATION	815 X 275.00		224,125.00
5. GROUND STORAGE RESERVOIR (1)			120,000.00
6. MAIN CONTROL BUILDING			250,000.00
TOTAL CONSTRUCTION			3,692,867.00
PER USER			4,531.00

FIGURE 2



DeWild Grant Reckert & Associates Co.
Architectural Engineering Planning
Rock Rapids, Iowa
Sioux City, Iowa
Sioux Falls, South Dakota

Date
Drawn By
Approved
Revised

KINGBROOK RURAL
WATER SYSTEM
PHASES 3 AND 4

The two figures diagram mainline distribution alignment and show general locations of wells, ground storage reservoirs, and booster stations. Also shown are preliminary cost estimate figures for each alternative.

Alternative One will be further evaluated for the remainder of this report.

IV. WATER DISTRIBUTION SYSTEM

A. Pipeline:

For purposes of this report two alternatives have been considered for the preliminary pipeline design. A detailed analysis of the mainline and distribution line sizes has been made.

The design of the proposed distribution system pipelines has been based on data taken from the water use survey sheets completed by each potential member. The rural domestic design is based on expected simultaneous peak demand for the number of subscribers on each line segment. The livestock design usage is based on maximum expected livestock use spread over a 12 hour period. Very large users may be required to provide some on-site storage in the form of stock tanks, etc., to take care of maximum instantaneous demand for livestock.

A minimum residual pressure of 20 psi at full dynamic loading has been designed for the water main adjoining each proposed customer; however, the average residual pressure throughout the entire system will be 35 to 40 psi. Minimum pipeline size used has been 1½ inches. The proposed design should provide very adequate service to the proposed users.

The mainline delivery system will be sized to deliver a one-day design supply of water over a 12-hour period. Consideration has been given to using off-peak capacity to serve remote portions of the project and wholesale users. A final decision will not be made until the groundwater exploration has been conducted and the needs of wholesale users have been established.

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An estimated 200,750 feet of service line has been included to bring the water from the mainlines to either the subscriber's basement or to a meter pit. It is the system's intention to complete the piping to the subscriber's desired point of service in order to encourage immediate use of the water and to facilitate uniform installation methods.

B. Water Storage and Pressure Facilities:

The proposed system is divided into three (3) separate service areas. Each service area receives primary pressurization from a central pumping station and ground storage reservoir. Secondary pressurization is provided from storage within the service area.

The Phase 3 service area would be pressurized from the main control building, except for one booster station. This booster station would be used for added pressure for the north end.

The Phase 4 service area receives pressurization from two pumping stations and ground storage reservoirs in addition to the main control building.

The main pipelines supplying the storage facilities have been designed to meet the areas maximum daily demand in 12 hours.

The identification, capacity and type of construction will be as follows:

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Summary of Storage Facilities

<u>Identification</u>	<u>Capacity (gallons)</u>	<u>Type</u>
Ramona Ground Storage Reservoir	50,000	Ground Storage
Winfred Main Control Building	100,000	Ground Storage
Orland Ground Storage Reservoir	50,000	Ground Storage
Total Storage Capacity =		200,000 gallons
System Storage Per User =		250 gallons

C. Design Data and Water Use Calculations:

1. Maximum Water Usage for Design Considerations -

The maximum use per day per connection was obtained directly from the numbers of people and livestock listed in the survey sheets. The total present and future livestock numbers listed were considered. The final delivery capacity was further adjusted to coincide with the current design procedures being used on other rural water systems in South Dakota. Maximum rural domestic usage was assumed to be 60 gallons per capital per day.

The estimated City and Town use per day was obtained from the 1970 census reports. The capacity provided was based on the use of 60 gallons per capita per day or as requested by the municipality.

The main pipelines, pumping stations, and storage reservoirs were sized to meet these maximum usages over a 12-hour design period. The following maximum usages are anticipated for the system.

See summary of Service Area Design Flows.

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SUMMARY OF SERVICE AREA MAXIMUM DESIGN FLOWS
PHASES 3 AND 4

KINGBROOK RURAL WATER SYSTEM

Design Service Area	Livestock Flow GPM (12 hr.)	Number of People	12 hr. Domestic Flow GPM @ 60 GPD	Total Flow GPM (12 hr.) Liv. & Dom.	Total Flow GPM (16 hr.)	Peak Demand GPM	Number of Connections
<u>Winfred</u>							
West	161.61	512	42.67	204.28	153.21	315	160
South	96.38	385	32.08	128.46	96.34	181	115
East	<u>117.49</u>	<u>254</u>	<u>21.17</u>	<u>138.66</u>	<u>103.99</u>	<u>141</u>	<u>183</u>
Subtotal	375.48	1,151	95.92	471.40	353.54		458
<u>Ramona</u>							
North	104.63	315	26.25	130.88	98.16	158	114
East	<u>68.62</u>	<u>497</u>	<u>41.42</u>	<u>110.04</u>	<u>82.53</u>	<u>146</u>	<u>98</u>
Subtotal	173.52	812	67.67	240.92	180.69		212
<u>Orland</u>							
South	<u>128.05</u>	<u>580</u>	<u>48.33</u>	<u>176.38</u>	<u>132.29</u>	<u>239</u>	<u>133</u>
Total	676.78	2,543	211.92	838.70	666.52	1,180	803

- NOTES: 1. Design Delivery on 12 hr. base - 388 gpm/803 connections = 1.11 gpm/connection
2. Average delivery per day = 1.11 x 12 hr. = 796 gpd/connection

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Maximum Water Usage for Design Considerations

Number of Retail Customers	803
Gallons per Day (GPD) Domestic -	
Rural Retail	151,440
Wholesale	<u>105,360</u>
Subtotal	256,800 = 35% of Total
GPD Livestock	<u>487,440</u> = 65% of Total
Total GPD	744,240
Gallons per Customer per Day	796 (Retail Users)
Gallons per Minute per Customer, over a 12-Hour Period	1.10 (Retail Users)

2. Initial Water Usage for Income Calculations -

The initial water usage per day per customer was obtained by tabulating the numbers of people and livestock listed on the survey sheets and applying estimated initial usage factors. Income calculations are based on the expected initial usage. Initial livestock usage was assumed to be 50 percent or one-half of the maximum livestock consumption. Initial rural domestic usage was assumed to be 50 percent or 30 gallons per capita per day.

The storage reservoirs are sized to meet the initial expected usage; however, pipelines and elevated storage facilities were designed to meet maximum usages with the addition of those future reservoirs previously listed. Based on the foregoing, this amounts to the following initial water usage.

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Initial Water Usage for Income Calculations

Customers	803
Gallons per Day Domestic -	
Rural Retail	75,720
Wholesale	52,680
Subtotal	128,400 = 35% of Total
Gallons per Day Livestock	243,720 = 65% of Total
Gallons per Day Total	372,120
Gallons per Day per Customer	397 (Retail Users)
Gallons per Minute per Customer over a 12-Hour Period	0.50 (Retail Users)

D. Hydraulics:

Complete hydraulic calculations using the maximum demand rate per customer from the data sheets as described above have been made to determine the best arrangement and most economical sizes of pipes to serve the proposed area. The distances and ground elevations were obtained for this feasibility report from maps published by the United States Geological Survey and maps developed in our office. The hydraulic calculations have been made with the use of our computer and are not a part of this report but are available for review upon request. The friction losses for the system were computed using the Hazen-Williams formula with a "C" value of 150 for polyvinylchloride (PVC) pipe.

There is a surface relief differential of about 250 feet in vertical elevation across the proposed system and because of this and the length of pipelines required, it is not feasible to design a system with a narrow range of working pressures. The design utilized in the proposed system will

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supply water to customers at the maximum rates determined from the data sheets with a minimum residual pressure of 20 pounds per square inch (psi) to each user. The average residual pressure will be in the range of 40 to 50 psi. The maximum pressure under static or low flow conditions will not exceed 65 psi. At those points in the pipeline where excessive pressures occur, individual pressure regulators will be installed ahead of the meter.

E. Miscellaneous Design Features:

Valves will be installed to enable the isolation of sections of pipe in the event of a line break or for maintenance in that section. Valves will be installed on every branch from the feeder main connecting the water source to the reservoirs or pumps. There will be cleanouts installed at the end of major "deadend" mains.

At the extreme high points where there are no adjacent customers, air relief valves will be installed to prevent entrapment of air in the pipelines.

All prices and estimates of probable costs are based on the use of Class 160 and/or Class 200 rigid PVC plastic pipe. All pipe of 1½ inch or smaller will be a minimum of Class 200.

Service connections will be made by means of a reducing tee or saddle tap. Standard service meters will be ¾ inch frost-proof meters installed with necessary fittings and valves. Individual pressure regulators will be installed at services ahead of the meter where required to control excessive pressures. The meters will be installed in basements or concrete (well curb) meter pits with frost-proof covers.

The exact location of the lines with respect to the road right-of-ways will be determined by the Engineer at the time of the final survey. Since much of the property adjoining the proposed lines

is owned by members of the Association, the lines will, in general, be placed on private property with easements being obtained from the respective property owners. If it is impossible to locate on private land because of the terrain or difficulty in obtaining easements, the pipelines in these locations will be placed within the public road right-of-way with permits obtained from the appropriate governing agency.

The lines will be installed with the minimum cover required to protect them from freezing.

Trenching will be primarily in glacial till and clay soils. No rock other than occasional glacial boulders is anticipated at this time. Difficulty is anticipated in some areas due to high ground-water table conditions, however, this will be to a small percentage of the total area.

Crossings of paved roads, and railroads will be made by boring so a steel or corrugated metal pipe encasement may be installed. The carrier pipeline will then be installed inside the encasement. All borings will be a minimum of 72 inches below the pavement or railroad ties.

F. Engineering:

The engineering has been completed for the preliminary design with the locations and sizes of mainlines calculated on the basis of the previously mentioned design flow per customer. If the Engineer finds conditions which require major revisions in the system or in the estimated costs at the time of preparation of detailed plans, the approval of such changes will be obtained from the office of the Farmers Home Administration before the final plans are submitted.

The construction specifications will meet standards of the American Water Works Association. Provisions will be made during construction for hydrostatically testing all of the lines and for disinfection of the system segments before they are placed in service.

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All plans and specifications will be submitted to Farmers Home Administration and the South Dakota Department of Environmental Protection for their respective reviews prior to advertising for construction bids.

G. Construction Bidding Procedures:

Competitive bids for construction of the proposed work will be requested and contracts awarded for all phases of the project. Contracts are usually awarded to the lowest responsible bidder subject to the approval of the Association, the Engineer, and the Farmers Home Administration.

All bidders are required to post a bid bond or certified check as bid security at the time of submitting bids, and the successful Contractor or Contractors will be required to file a Performance Bond in the amount of 100 percent of the contract amount. This bond will also guarantee the workmanship and materials for a period of one year after completion and acceptance of the project.

H. Life of Facilities:

With proper construction and maintenance, the system should, with the exception of pumps, motors, and paint coatings, have a useful life of not less than 40 years. Repainting of exposed units can probably be expected about every 5 years and replacement of the working parts of pumps and motors within about 15 years.

V. WHOLESALE USERS TO BE SERVED

The towns and cities of Howard, Ramona, Oldham and Winfred have made application to be subscribers to the Kingbrook Rural Water System. The service to be provided, connection charge, water rates, and basis for design is summarized as follows:

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A. Water Service to Howard:

Howard will be furnished water during "off-peak" periods to their existing ground storage reservoir. The design costs to serve Howard are based on sufficient pressure to deliver water to their existing ground storage reservoir, they will then pump to elevated storage.

B. Water Service to Winfred:

The town of Winfred does not have existing elevated storage so water will be delivered to them on a demand basis, to their distribution lines, that is water will be furnished at such volume and pressure to meet the expected instantaneous peak demand. Winfred will maintain their own distribution system within the Town limits.

C. Water Service to Oldham and Ramona:

Oldham and Ramona will be furnished water on a demand and "off-peak" combination. Service to Oldham will be provided at sufficient pressure to fill their existing elevated storage. Ramona will be furnished water to their existing ground storage reservoir. The design costs to serve Ramona are based on sufficient pressure to deliver water to their existing ground storage reservoir, they will then have to pressurize their system beyond the reservoir.

D. Requirements of the Towns:

Water will be supplied to the towns for domestic use only. Flows necessary to meet fire demands will not be furnished; however, those towns with elevated storage facilities, will still have this water to draw on for emergencies such as a fire. It is understood that each wholesale buyer will be provided with a master meter at the point of delivery and that distribution beyond the point of delivery will be the responsibility of the buyer.

For purposes of this report, the service provided to all towns, except Winfred, is on the basis of requests made by the City officials.

The cost of providing service to Winfred is estimated on the basis of providing demand service.

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Capacity in excess of 60 GPCD can be provided during the final design phase, upon request from the wholesale users. In general, it can be assumed the increased capacities will require increases in the hookup charge and monthly minimum provided in paragraphs E and F below, however, the estimated cost per 1,000 gallons will not change significantly.

E. Wholesale User Connection Charge:

The wholesale user connection charge is computed on the basis of five (5) percent of the estimated total added cost of providing the pipeline delivery capacity. The costs have been estimated and it is anticipated the adjustments will be made after actual costs have been determined. The estimated cost and recommended connection charge and monthly minimum to provide the service outlined in Paragraph D above is as shown in tabular form on Page 17.

In determining the wholesale user cost it has been assumed that the wholesale user will carry the responsibility for loan repayment on that portion of project required to meet their needs and the monthly minimum corresponds to that requirement. The gallons per day shown on the table represents the quantity that can be delivered with the "demand" and "off-peak" capacities shown.

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F. Computation of Wholesale Rate:

The town of Winfred will be receiving water in sufficient quantities to meet their peak demand conditions. It is recommended that their wholesale rate be \$0.75/1,000 gallons plus a monthly minimum of \$50.00/month.

All other wholesale users will be receiving water "off-peak" or a combination of "off-peak" and "demand" service and providing their own storage. Their rate shall also consist of a fixed monthly minimum plus an additional amount per 1,000 gallons of water used. The monthly minimum is based on that amount required to repay the loan amount required to construct the additional facilities required to serve the user. The charge per 1,000 gallons is based on the operation, and maintenance, cost required to deliver the water. The recommended rate is \$0.75/1,000 gallons and will have to be verified by actual construction and operating costs.

In all cases the wholesale user will have the option of eliminating the monthly minimum by making a payment, as an aid in cost of construction, in the amount of the added construction cost.

SUMMARY OF WHOLESALE USER CONSTRUCTION COSTS,
DESIGN DELIVERY AND CHARGES

<u>Location</u>	<u>Added Construction Cost</u>	<u>GPM Cff Peak</u>	<u>GPM Demand</u>	<u>GPD</u>	<u>Connection Charge</u>	<u>Monthly Minimum</u>
Howard	Basic System \$40,000.00 \$50,000.00	0 300 300	0 0 50	0 180,000 222,000	\$2,000.00 \$2,500.00	\$200.00 \$250.00
Winfred	Basic System \$ 5,000.00	0 0	0 30	0 25,200	\$ 500.00	\$ 50.00
Oldham	Basic System \$51,700.00	0 40	0 20	0 40,800	\$2,585.00	\$253.00
Ramona	Basic System \$ 6,000.00	0 20	0 25	0 33,000	\$ 600.00	\$ 60.00

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G. Wholesale User Existing Facilities:

The proposed wholesale users presently have the following storage facilities (capacity in gallons):

<u>Location</u>	<u>Ground Storage</u>	<u>Elevated Storage</u>	<u>Pneumatic Tank</u>
Howard	100,00	80,000	
Winfred	30,000		500
Oldham	4,000	50,000	
Ramona	20,000		7,000

H. Proposed Rate Schedule:

Retail Rural Users

First	1,000 gallons	\$8.50 minimum
Next	2,000 gallons	\$3.00/1,000 gallons
Next	4,000 gallons	\$2.50/1,000 gallons
Next	8,000 gallons	\$1.75/1,000 gallons
Next	10,000 gallons	\$1.25/1,000 gallons
Over	25,000 gallons	\$0.75/1,000 gallons

VI. PROPERTY REQUIREMENTS AND OTHER COSTS

A. Land Required for Structures:

Land will be required for the proposed well and treatment plant sites, elevated storage tanks, ground storage reservoirs, and pumping stations. These sites can be acquired either through purchase or by obtaining perpetual easements.

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B. Distribution Pipeline Easements and Permits:

1. Privately Owned Lands -

Easements or permits to construct and maintain lines which cross or lie on privately owned lands must be obtained prior to submitting the final load docket.

2. Site Acquisition -

Funds have been reserved in the estimate of probable cost to cover site acquisition and easements. It has been customary on other projects of the same type that no payment is made for easements or crop damage. Should the Contractor become lax in his operations, he shall be held responsible for damages of crops outside of the limits of the construction easements.

3. State, County and Railroad Properties -

Permits will be obtained from the necessary agencies at locations where pipelines must cross under or use public road or railroad right-of-ways.

C. Other Costs:

Additional costs which are included in the estimates of probable cost include engineering and legal fees, abstracting costs, water exploratory costs, easement filing costs, and insurance premiums.

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VII. COST SUMMARY AND FINANCING

A. Total System Cost: (Sum of 2 Phases)

	<u>Rural Users Only</u>	<u>Including 3 Wholesale Users</u>
Construction Cost	\$3,837,114	\$3,939,814
Project Cost	\$4,243,482	\$4,355,000
FmHA Loan	\$3,100,000	\$3,275,000
Grant Funds	\$1,143,482	\$ 911,565

B. Association Contribution:

Rural, per User	\$ 250	\$ 250
Rural, Total	\$ 200,750	\$ 200,750
Wholesale Town Users	<u>-0-</u>	<u>5,685</u>
Total Association Revenue	\$ 200,750	\$ 206,435
Less Initial Operation and Maintenance	\$ 38,000	\$ 38,000
Applicant Contribution	\$ 162,750	\$ 168,435

It is hereby recommended that the proposed system be financed with a loan from the Farmers Home Administration in the amount of \$3,275,000 and State and Federal Grant Funds in the amount of \$911,565. On the basis of current practice the loan would have a term of 40 years and bear interest at the rate of 5 percent per annum.

VIII. ECONOMIC ANALYSIS

The cost summary presented in Section VII above is a composite of the two phases of the project. Because of the size of the total project and the likelihood of phase construction and economic analysis is presented by phases.

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The following cost estimates have been prepared by the Engineer without the benefit of final design, plans, or survey. (Date of Cost Estimate - April, 1977).

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IX. COST ESTIMATE AND FINANCIAL SUMMARY

A. Cost Estimate - Phase 3:

<u>Item No.</u>	<u>Description</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Estimated Cost</u>
<u>Construction Costs:</u>				
1.	8" PVC pipe	5,300 L.F.	\$4.00	\$ 21,200.00
		42,400 L.F.	\$3.80	161,120.00
2.	6" PVC pipe	63,600 L.F.	\$2.05	130,380.00
		0	\$1.75	
3.	5" PVC pipe	53,000 L.F.	\$1.60	84,800.00
		26,500 L.F.	\$1.40	37,100.00
4.	4" PVC pipe	37,100 L.F.	\$1.20	44,520.00
		15,900 L.F.	\$1.10	17,490.00
5.	3" PVC pipe	23,300 L.F.	\$0.95	22,135.00
		37,100 L.F.	\$0.85	31,535.00
6.	2½" PVC pipe	58,300 L.F.	\$0.75	43,725.00
		37,100 L.F.	\$0.70	25,970.00
7.	2" PVC pipe	149,400 L.F.	\$0.70	104,580.00
		95,650 L.F.	\$0.65	62,172.50
8.	1½" PVC pipe	318,900 L.F.	\$0.60	191,340.00
	Sub-Total			\$ 978,067.50
9.	Add 10% to cost of pipe for cost of valves, crossings, regulators, line cleanout, etc.			97,807.00
10.	1½" PVC pipe (Service Line)	66,250 L.F.	\$0.60	39,750.00

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<u>Item No.</u>	<u>Description</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Estimated Cost</u>
11.	Meter Service Installation (basement and meter pit average including meter pit average including meter, check valve, etc.	265 Users	\$275.00	72,875.00
12.	Wells and high service pumping, joint cost with Phase 4 System	(265/803) 33% of \$425,000	Lump Sum	140,250.00
13.	Booster Station	1	Lump Sum	50,000.00
Total Estimated Construction Cost				\$1,378,749.50

Other Costs:

Engineering	\$ 85,285.00
Legal (0.5%)	6,200.00
Easements (0.5%)	6,200.00
Land	5,000.00
Inspection	12,000.00
Contingencies (3%)	37,192.00
Estimated Project Cost	\$1,530,626.50

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Cost/User	\$5,776.00
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Miles of Pipeline	182
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Users	265
-------	-----

Users per Mile	1.46
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Estimated additional
total cost to serve
the Towns of Howard
and Winfred

49,050.00

TOTAL ESTIMATED PROJECT COST

\$1,579,676.50

USE

\$1,580,000.00

Recommended Financing:

FmHA Loan

\$1,175,000.00

Wholesale User Contribution

2,500.00

Applicant Contribution

53,710.00

Grant Funds

348,790.00

Total

\$1,580,000.00

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B. Phase 3 - Balance Sheet:

1. Income (Annual)

a.	Water sales to rural users (265 users) (\$28.00/mo.) (12)	89,640.00
b.	Wholesale water sales (30 GPD) (38,550) (0.75/1,000 gal.) (365)	<u>10,553.00</u>
	Total Annual Income	\$ 99,593.00

2. Expenses (Annual)

a.	Operation and maintenance costs (265 users) (\$80/user/year)	21,200.00
b.	Debt service on loan \$1,175,000, 38 years 5% @ \$59.28/\$1,000/yr.	69,654.00
c.	Annual reserve balance	<u>8,739.00</u>
	Total Annual Expenditures	\$ 99,593.00

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C. Cost Estimate - Phase 4:

<u>Item No.</u>	<u>Description</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Estimated Cost</u>
1.	8" PVC pipe	0	\$4.00	
		47,700 L.F.	\$3.80	\$ 181,260.00
2.	6" PVC pipe	47,700 L.F.	\$2.05	92,785.00
		15,900 L.F.	\$1.75	27,825.00
3.	5" PVC pipe	31,800 L.F.	\$1.60	50,880.00
		76,850 L.F.	\$1.40	107,590.00
4.	4" PVC pipe	121,900 L.F.	\$1.20	146,280.00
		82,050 L.F.	\$1.10	90,255.00
5.	3" PVC pipe	148,400 L.F.	\$0.95	140,980.00
		68,900 L.F.	\$0.85	58,565.00
6.	2½" PVC pipe	97,600 L.F.	\$0.75	73,200.00
		106,000 L.F.	\$0.70	74,200.00
7.	2" PVC pipe	250,900 L.F.	\$0.70	175,630.00
		130,200 L.F.	\$0.65	84,630.00
8.	1½" PVC pipe	480,920 L.F.	\$0.60	288,552.00
	Subtotal			\$1,597,632.00
9.	Add 10% to cost of pipe for cost of valves, crossings, regulators, line cleanouts, etc.			147,333.00
10.	1½" PVC pipe (Service Line)	134,500 L.F.	\$0.60	80,700.00

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<u>Item No.</u>	<u>Description</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Estimated Cost</u>
11.	Meter service installation (basement and meter pit average including meter, check valve, etc.	538 Users	\$275.00	147,950.00
12.	Wells and high service pumping, joint cost with Phase 3 System	(538/803) 67% of \$425,000	Lump Sum	284,750.00
13.	Reservoir and pumping station	2	Lump Sum	<u>200,000.00</u>
Total Estimated Construction Cost				\$2,458,365.00

Other Costs:

Engineering	140,819.00
Legal (0.5%)	11,084.00
Easements (0.5%)	11,084.00
Land	10,000.00
Inspection	15,000.00
Contingencies (3%)	<u>66,504.00</u>
Estimated Project Cost	\$2,712,856.00

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Cost/User	\$5,043	
Miles of Pipeline	323	
Users (502 rural) (36 cottages)		
Users per mile	1.66	
Estimated additional total cost to serve the Towns of Oldham and Ramona		<u>62,130.00</u>

TOTAL ESTIMATED PROJECT COST	\$2,774,986.00
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USE	\$2,775,000.00
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Recommended Financing:

FmHA Loan	\$2,100,000.00
Wholesale User Contribution	3,185.00
Applicant Contribution	109,040.00
Grant Funds	<u>562,775.00</u>
Total	\$2,775,000.00

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D. Phase 4 - Balance Sheet:

1. Income (Annual)

a.	Water sales to rural users (502 users) (28.00/mo.) (12)	168,672.00
b.	Cottages and seasonal users (36 users) (9.00/mo.) (12)	3,888.00
c.	Wholesale water sales (30 GPD) (14,130 GPD) (0.75/1,000 gal.) (365)	<u>3,868.00</u>
	Total Annual Income	\$ 176,428.00

2. Expenses (Annual)

a.	Operation and maintenance Cost (538 users) (\$80/user/year)	43,040.00
b.	Debt service on loan 2,100,000, 32 years 5% @ \$52.28/\$1,000/year	124,488.00
c.	Annual reserve balance	<u>8,900.00</u>
	Total Annual Expenditures	\$ 176,428.00

DEWILD, GRANT, RECKERT & ASSOCIATES CO.

X. SUMMARY, RECOMMENDATIONS AND COMMENTS

A. Total System Project Summary:

Retail Customers Served	803
Wholesale Town Population Served	1,756
Total Pipe Mileage	505 miles
Retail Customers Per Mile	1.59
Ground Storage Reservoirs	2
Booster Stations	1
Total Construction Cost	\$3,837,114*
Total Project Cost .	\$4,243,482*
Loan Required	\$3,275,000*
Association Funds Required	\$162,750*
Grant Funds Required	\$911,565*
Total Cost per Mile of Pipe	\$8,403.00
Total Cost per Retail Customer	\$5,285.00*

*Does not include the cost of serving
the wholesale users.

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B. Economic Feasibility:

The economic analysis section of this report was prepared under the assumption that limited state and federal grant funds would be available to defray initial project costs.

For economic and other reasons it is recommended that if funds are available, the system be constructed in phases.

The economic analysis has been made with one water supply source located as previously indicated in this report.

C. Association Contribution:

The Association contribution should average \$250.00 per rural customer which represents about 5½ percent of the project cost per customer. The initial feasibility fee previously collected has been credited toward the total connection charge per customer.

There are quite a few additional prospective rural customers who could connect to the system if they chose to do so. It is recommended that all additional customers who desire service after construction has started to be charged the full amount plus an additional amount to be determined by the Association Board. This can be handled in a businesslike manner by including a statement of the Association policy regarding post-connection customer hookup charges in the printed Association regulations.

D. Loan Required:

We hereby recommend that a loan be approved for \$3,275,000.00.

E. Repayment Terms:

It is recommended that the loan have a term of forty years and be repaid from the proceeds of the sale of water to Association customers according to the Rate Schedules and/or Balance Sheets in Section IX.

F. Property and Liability Insurance:

It is recommended that property and fire insurance be carried on all buildings and all pumps and electrical control units. The Association should also carry liability insurance to cover any person hired for operational and maintenance work.

DEWILD, GRANT, RECKERT & ASSOCIATES CO.

XI. COST ESTIMATE AND FINANCIAL SUMMARY FOR PHASES 1 THRU 4

A. Cost Estimate:

1. Basic distribution system cost

Phase 1 - Bid & C.O. 1	\$2,021,387
Phase 2	780,614
Phase 3	1,188,499
Phase 4	<u>1,973,615</u>
Total	\$5,964,115

2. Added distribution system cost
to serve wholesale users:

Lake Norden (population 393)	25,000
Badger (population 122)	5,000
Lake Preston (population 812)	40,000
Howard (population 1,175)	40,000
Winfred (population 110)	5,000
Oldham (population 244)	51,700
Ramona (population 227)	<u>6,000</u>
Subtotal	\$6,136,815

3. Basic cost of other facilities

Subtotal	7,474,215
Phase 1 - Bid & C.O. 1	262,400
Phase 2	400,000
Phase 3	190,250
Phase 4	<u>484,750</u>
Total	\$1,337,400

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4. Other Costs:

Engineering

Phase 1	\$ 132,090
Phase 2	74,882
Phase 3	85,285
Phase 4	<u>140,819</u>

Total \$ 433,076

Legal 35,472

Easements 35,472

Land 25,000

Inspection 110,000

Contingencies 212,830

Total \$8,326,065

USE \$8,327,000

Cost per User \$4,426.90

Miles of Pipeline 966

Users: Rural 1,516
Cottages
& Towns 365

Total 1,881

Users per Mile 1.95

B. Balance Sheet:

1. Income (Annual)

a. Water sales to rural users (1516) (28.00/mo.) (12)	\$ 509,375
b. Water Sales to Cottage Users (314) (78.00/yr.)	24,492
c. Water Sales to Retail Towns (51) (9.00/mo.) (12)	5,508

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d. Water Sales to Wholesale Towns

Lake Norden (393 pop.) (30 gpcd) (0.75/1,000 gal.) (365) + (\$30/mo. min.) (12)	3,645
Badger (122 pop.) (30 gpcd) (0.75/1,000 gal.) (365) + (\$30/mo. min.) (12)	1,455
Lake Preston (812 pop.) (30 gpcd) (0.75/1,000 gal.) (365) + (\$190/mo. min.) (12)	9,124
Howard (1,175 pop.) (30 gpcd) (0.75/1,000 gal.) (365) + (\$200/mo. min.) (12)	11,981
Winfred (110 pop.) (30 gpcd) (0.75/1,000 gal.) (365) + (\$50.00/mo. min.) (12)	1,503
Oldham (244 pop.) (30 gpcd) (0.75/1,000 gal.) (365) + (\$259/mo. min.) (12)	5,112
Ramona (227 pop.) (30 gpcd) (0.75/1,000 gal.) (365) + (\$60/mo. min.) (12)	<u>2,992</u>
Total Annual Income	\$ 575,188

2. Expenses (Annual)

a. Operation and maintenance costs (1,881 users) (\$80/user/yr.)	\$ 150,480
b. Debt service on loan (5,865,000 38 yrs. 5% @ 59.28/1,000/yr.)	347,677
c. Annual reserve balance	<u>77,031</u>
Total Annual Expenses	\$ 575,188

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Phase 1 thru 4 Financing:

	<u>Required</u>	<u>Provided</u>	<u>Needed</u>
FmHA Loan	\$5,865,000	\$1,615,000	\$4,250,000
FmHA Grant	1,799,565	849,000	950,565
State Grant	300,000	200,000	100,000
Applicant Contribution	<u>362,435</u>	<u>136,000</u>	<u>226,435</u>
Total	\$8,327,000	\$2,800,000	\$5,527,000

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ADDENDUM TO

FINAL
ENGINEERING REPORT AND FEASIBILITY STUDY
FOR
PHASE 3 AND 4
KINGBROOK RURAL WATER SYSTEM, INC.
ARLINGTON, SOUTH DAKOTA

February 3, 1978

DEWILD GRANT RECKERT & ASSOCIATES CO.

IX. COST ESTIMATE AND FINANCIAL SUMMARY

A. Cost Estimate - Phase 3:

<u>Item No.</u>	<u>Description</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Estimated Cost</u>
<u>Construction Costs:</u>				
1.	6" PVC pipe	21,200 L.F.	\$2.05	\$ 43,460.00
		42,400 L.F.	\$1.75	74,200.00
2.	5" PVC pipe	42,400 L.F.	\$1.60	67,840.00
		15,900 L.F.	\$1.40	22,260.00
3.	4" PVC pipe	47,700 L.F.	\$1.20	57,240.00
		37,100 L.F.	\$1.10	40,810.00
4.	3" PVC pipe	15,900 L.F.	\$0.95	15,105.00
		26,500 L.F.	\$0.85	22,525.00
5.	2½" PVC pipe	53,000 L.F.	\$0.75	39,750.00
		26,200 L.F.	\$0.70	18,340.00
6.	2" PVC pipe	111,600 L.F.	\$0.70	78,120.00
		132,500 L.F.	\$0.65	86,125.00
7.	1½" PVC pipe	284,900 L.F.	\$0.60	<u>170,940.00</u>
	Sub-Total			\$ 736,715.00
8.	Add 10% to cost of pipe for cost of valves, crossings, regulators, line cleanouts, etc.			73,670.00
9.	1½" PVC pipe (Service Line)	60,000 L.F.	\$0.60	36,000.00
10.	Meter Service Installation (basement and meter pit average including meter pit average including meter, check valve, etc.	240 users	\$275.00	66,000.00

DEWILD GRANT RECKERT & ASSOCIATES CO.

<u>Item No.</u>	<u>Description</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Estimated Cost</u>
11.	Wells and high service pumping, joint cost with Phase 4 System	(240/778) 33% of \$425,000	Lump Sum	140,250.00
12.	Booster Station	1	Lump Sum	<u>35,000.00</u>
Total Estimated Construction Cost				\$1,087,635.00

Other Costs:

Engineering	\$ 70,000.00
Legal (0.5%)	5,500.00
Easements (0.5%)	5,000.00
Land	5,000.00
Inspection	12,000.00
Contingencies (3%)	<u>33,000.00</u>
Estimated Project Cost	\$1,218,135.00

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Cost/User	\$5,075.00
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Miles of Pipeline	161
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Users	240
-------	-----

Users per mile	1.48
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Estimated additional
total cost to serve
the Towns of Howard
and Winfred

49,050.00

TOTAL ESTIMATED PROJECT COST

\$1,267,185.00

USE

\$1,268,000.00

Recommended Financing:

FmHA Loan

\$ 975,000.00

Wholesale User Contribution

2,500.00

Applicant Contribution

48,000.00

Grant Funds

242,500.00

TOTAL

\$1,268,000.00

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B. Phase 3 - Balance Sheet:

1. Income (Annual)

a.	Water sales to rural users (240 users) (\$28.00/mo.) (12)	80,640.00
b.	Wholesale water sales (30 GPCD) (38,550) (0.75/1,000) gal.) (365)	<u>10,553.00</u>
	Total Annual Income	\$ 91,193.00

2. Expenses (Annual)

a.	Operation and maintenance costs (240 users) (\$100/user/year)	24,000.00
b.	Debt service on loan \$975,000, 38 years 5% @ \$59.28/\$1,000/yr.	57,798.00
c.	Annual reserve balance	<u>9,395.00</u>
	Total Annual Expenditures	\$ 91,193.00

DEWILD GRANT RECKERT & ASSOCIATES CO.

Construction Cost Summary (including cost to serve the
Wholesale Communities):

Phase 3 (Distribution System)	\$ 961,435.00
Phase 4 (Distribution System)	<u>2,035,745.00</u>
Sub-total	\$2,997,180.00
Booster Station	35,000.00
Reservoirs and Pumping Stations	200,000.00
Wells and Water Treatment Plant	<u>425,000.00</u>
Total Estimated Construction Cost	\$3,657,180.00

Other Costs:

Engineering	\$ 200,759.00
Legal	18,285.00
Easements	15,000.00
Land	15,000.00
Inspection	27,000.00
Test Drilling	4,000.00
Contingencies (3%)	<u>109,710.00</u>
Total Estimated Project Cost	\$4,046,934.00
USE	<u>\$4,047,000.00</u>

DEWILD GRANT RECKERT & ASSOCIATES Co.

BALANCE SHEET

1.	Income (annual)	
a.	Water sales to rural users (742 users) (28.00/mo.) (12)	\$ 249,312.00
b.	Cottages and seasonal users (36 users) (9.00/mo.) (12)	3,888.00
c.	Wholesale water sales (30 GPD) (52,680) (0.75/1000 gal.) (365)	<u>14,421.00</u>
	Total Annual Income	\$ 267,621.00
2.	Expenses (annual)	
a.	Operation and maintenance costs (778 users) (\$100/user/year)	\$ 77,300.00
b.	Debt service on loan (3,000,000) (38 years) 5% @ 59.28/1,000/yr.	177,840.00
c.	Annual reserve balance	<u>11,981.00</u>
		\$ 267,621.00

Recommended Financing:

FmHA Loan	\$3,000,000.00
Wholesale User Contribution	5,685.00
Applicant Contribution	156,315.00
Grant Funds	<u>885,900.00</u>
Total	\$4,047,000.00

DEWILD GRANT RECKERT & ASSOCIATES CO.

X. SUMMARY, RECOMMENDATIONS AND COMMENTS

A. Total System Project Summary:

	<u>Phases 3 & 4</u>	<u>Phases 1, 2, 3 & 4</u>
Retail Customers Served	778	1,926
Wholesale Town Population Served	1,756	2,271
Total Pipe Mileage	484 miles	1,006 miles
Retail Customers Per Mile	1.61	1.91
Ground Storage Reservoirs	2	4
Booster Stations	1	1
Total Construction Cost	\$3,657,180	\$8,131,208
Total Project Cost	\$4,046,935	\$9,418,275
Loan Required	\$3,000,000	\$6,119,000
Association Funds Required	\$162,000	\$300,715
Grant Funds Required	\$885,000	\$2,998,000
Total Cost per Mile of Pipe	\$8,361	\$9,362
Total Cost per Retail Customer	\$5,139	\$4,890

DEWILD GRANT RECKERT & ASSOCIATES C.

XI. COST ESTIMATE AND FINANCIAL SUMMARY FOR PHASES 1 THRU 4

A. Cost Estimate:

1. Basic distribution system cost

Phase 1 - Bid & C.O. 1 and 2	\$2,068,886
Phase 2 - Bid and C.O. 1	1,329,609
Phase 3	947,385
Phase 4	<u>1,973,615</u>
Sub-Total	\$6,319,495

2. Added distribution system cost
to serve wholesale users:

Lake Norden (population 393)	25,000
Badger (population 122)	5,000
Howard (population 1,175)	40,000
Winfred (population 110)	5,000
Oldham (population 244)	51,700
Ramona (population 227)	<u>6,000</u>
Sub-total	\$132,700

3. Basic cost of other facilities

Phase 1 - Bid and C.O. 1 and 2	264,380
Phase 2 - Bid and C.O. 1	389,633
Phase 3	140,250
Phase 4	484,750
Bruce Water Treatment Plant	<u>400,000</u>
Sub-Total	\$1,679,013

TOTAL CONSTRUCTION COST \$8,131,208

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4. Other Costs:

Engineering

Phase 1	\$ 154,563
Phase 2	103,160
Phases 3 and	200,759
Phase 4	

Sub-Total	\$458,482
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Legal	35,472
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Easements	35,472
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Land	25,000
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Inspection	110,000
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Contingencies	<u>622,641</u>
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Sub-Total	\$828,585
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TOTAL PROJECT COSTS	\$9,418,275
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Cost per User	\$4,890.00
---------------	------------

Miles of Pipeline	1,006
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Users: Rural	1,561
Cottages &	
Towns	365

Total	1,926
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Users per Mile	1.91
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B. Balance Sheet:

1. Income (Annual)

a. Water sales to rural users (1561) (28.00/mo.) (12)	\$ 524,495
--	------------

b. Water sales to Cottage Users (314) (78.00/yr.)	24,492
--	--------

c. Water sales to Retail Towns (51) (9.00/mo.) (12)	5,508
--	-------

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d. Water sales to Wholesale Towns

Lake Norden (393 pop.) (30 gpcd) (0.75/1,000 gal.) (365) + (\$30/mo. min.) (12)	\$ 3,645
Badger (122 pop.) (30 gpcd) (0.75/1,000 gal.) (365) + (\$30/mo. min.) (12)	1,455
Howard (1,175 pop.) (30 gpcd) (0.75/1,000 gal.) (365) + (\$200/mo. min.) (12)	11,981
Winfred (110 pop.) (30 gpcd) (0.75/1,000 gal.) (365) + (\$50.00/mo. min.) (12)	1,503
Oldham (244 pop.) (30 gpcd) (0.75/1,000 gal.) (365) + (\$259/mo. min.) (12)	5,112
Ramona (227 pop.) (30 gpcd) (0.75/1,000 gal.) (365) + (\$60/mo. min.) (12)	<u>2,992</u>
Total Annual Income	\$581,184

2. Expenses (Annual)

a. Operation and maintenance costs (1,926 users) (\$100/user/yr.)	\$192,600
b. Debt service on loan (6,119,000 38 yrs. 5% @ 59.28/1,000/yr.)	362,734
c. Annual reserve balance	<u>25,350</u>
Total Annual Expenses	\$581,184

DEWILD GRANT RECKERT & ASSOCIATES CO.

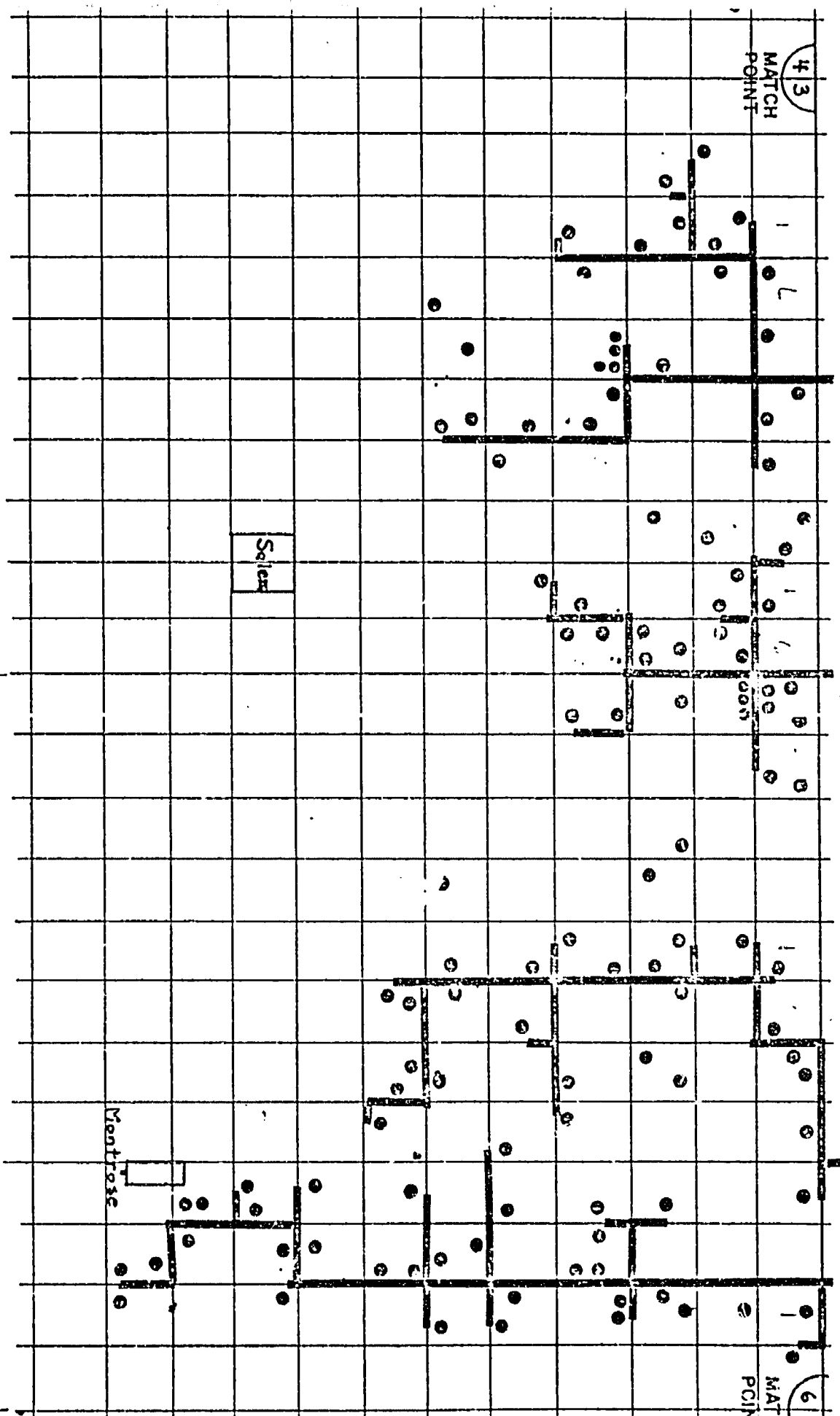
Phase 1 thru 4 Financing:*

	<u>Required</u>	<u>Provided</u>	<u>Needed</u>
FmHA Loan	\$6,119,000	\$3,194,000	\$2,925,000
FmHA Grant	2,698,560	1,844,000	854,560
State Grant	300,000	200,000	100,000
Applicant Contribution	<u>300,715</u>	<u>140,000</u>	<u>160,715</u>
Total	\$9,418,275	\$5,378,000	\$4,040,275

*Assumes Phases 3 and 4 funded at the same time.

DEWILD GRANT RECKERT & ASSOCIATES CO.

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MATCH
POINT



MC COOK COUNTY

GENERAL LOCATION MAP



**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 1/4 NE 1/4 8-105N-51W	BS-NSC	PE
5646-3	KINGBROOK RURAL WATER SYS	1.00	425	1992-03-19	NW 1/4 SW 1/4 9-105N-51W	BS-NSC	PE
5643-3	KINGBROOK RWS, INC		425	1992-03-19	Portions of sections 8, 9, 17; all in 105N-51W	BS-NSC	FU
4137-3	KINGBROOK RWS INC	1.06	*	1977-03-04	SW 1/4 SE 1/4 8-111N-56W	VEF	LC
5186-3	KINGBROOK RWS INC				SE 1/4 NE 1/4 8-111N-56W		
5208-3	KINGBROOK RWS	0.70	*	1988-03-29	SE 1/4 NE 1/4 17-111N-56W	VEF	LC
5208A-3	KINGBROOK RURAL WATER SYS	1.40	*	1988-08-15	SW 1/4 SW 1/4 16-111N-56W	VEF	LC
5426-3	KINGBROOK RWS		*	1988-08-15	5208A-3 changes location of diversion points	VEF	PE
5785-3	KINGBROOK RWS, INC.	1.40	*	1988-08-15	E 1/2 NW 1/4, SW 1/4 NE 1/4 6-111N-56W	VEF	LC
*Combined diversions under all permits in the Vermillion East Fork aquifer may not exceed 1,350 acre-feet annually							
5209-3	KINGBROOK RWS		*	1993-08-25	SE 1/4 NW 1/4, NW 1/4 NW 1/4 6-111N-56W	VEF	PE
5079-3	BROOKINGS-DEUEL-KINGBROOK	2.90		1988-08-15	Portions of sections 10 & 8, 6; all in 111N-56W	VEF	FU
2612A-3	BROOKINGS-DEUEL-KINGBROOK		*	1975-05-05	NE 1/4 24; NE 1/4 NE 1/4 25; 112N-51W; NW 1/4 SW 1/4 19-112N-50W	BS-B	LC
5434-3	BROOKINGS-DEUEL-KINGBROOK	0.89	210	1977-06-06			
5602-3	BROOKINGS-DEUEL-KINGBROOK	224	1976-03-01	1990-04-02	NW 1/4 NE 1/4 25-112N-51W	BS-B	LC
5821-3	BROOKINGS-DEUEL-KINGBROOK	1.00	434	1977-06-06	Same as 2612A-3	BS-B	PE
*No acre-feet limitation specified on Permit No. 5079-3					NE 1/4 NE 1/4 25-112N-51W	BS-B	PE
3982-3	BROOKINGS-DEUEL-KINGBROOK		1994-05-05	Connect City of Arlington	BS-B	PE	
3982A-3	BROOKINGS-DEUEL-KINGBROOK	869	1977-06-06				
					Parts of 24, 25-112N-51W and 19-112N-50W	BS-B	FU
				1994-01-10	Added all SW 1/4 sec 19	BS-B	FU

December 15, 1995

Permit No. **4367-3**
X River - Water District

Report Of Examination Of Works And/Or Application of Water To Beneficial Use

TO: Chief Engineer, Water Rights Program, DENR, Foss Bldg., Pierre, SD 57501

I have this day, 19 June 1996, made a thorough examination of the water use system constructed by Kingbrook Rural Water System Inc. of Drawer 299, Arlington SD holder of Permit No. 4367-3, bearing the priority of 9 January 1979 authorizing the diversion of 3.0 cu. ft. per second of the waters of Big Sioux; Northern Skunk Creek Aquifer for rural water system purposes, in Lake County and the defined service Counties.

I have to report on the conditions of the same as follows:

A. Works used to divert the water:
Two wells, one 73 feet deep and one 72 feet deep, drilled by Grimshaw Drilling.

B. Works used to transport water to place of use:
Rural water system mains of various sizes

C. Works used to apply water to beneficial use:
rural water system distribution lines of various sizes

The system is in the following condition excellent. The point of diversion is located well number 1 in the SE1/4NE1/4 section 8 T105N R51W or approximately 120 feet west and 170 feet north of the east quarter corner of section 8 T105N R51W. Well number 2 in the NE1/4NE1/4 section 17 T105N R51W or approximately 110 feet west and 225 feet south of the northeast section corner of section 17 T105N R51W. Distances are approximate as the legal section corners were not physically located and the distances were sealed from a not to scale map. The works are capable of diverting and conveying to the place of use 3.0 cu. ft. per second of water which is to be used for rural water system. Water has been put to beneficial use to the maximum extent as follows:

Water from the wells is pumped to the treatment plant located in the NE1/4 section 17 T105N R51W. From the treatment plant water is distributed to rural water system customers.

the license should be issued for 3.0 cfs.

Applicable permit qualifications have been complied with: Yes **X**

Date Report Completed: 20 June 1996

Gale N. Selken

Gale N. Selken, P.E.
Natural Resources Engineer
DENR, Water Rights Program

REPORT ON INSPECTION OF PERMIT NO. 4367-3

Other permit(s) associated with the project: 5646-3

DATE OF INSPECTION: 19 June 1996

NAME & ADDRESS OF INSPECTION CONTACT/ Lowell Corbin Operations Manager and Morris Elcock General Manager, Drawer 229 Arlington SD

RELATIONSHIP TO PERMIT HOLDER, IF APPLICABLE: see above

NAME & ADDRESS OF PERMIT HOLDER: Kingbrook Rural Water System Inc., Drawer 299 Arlington SD

DIVERSION POINT LEGAL LOCATION: well number 1 = SE1/4NE1/4 section 8 T105N R51W or approximately 120 feet west and 170 feet north of the east quarter corner section 8 T105N R51W, well number 2 = NE1/4NE1/4 section 17 T105N R51W or approximately 110 feet west and 225 feet south of the northeast section corner of section 17 T105N R51W. Distances are approximate as the legal section corners were not physically located and the distances were scaled from a not to scale aerial photograph.

WELL INFORMATION:

- 1) Well Drilling Firm: Grimshaw
- 2) No. of Wells two
- 3) Depth(s) #1 = 73 #2 = 72 feet
- 4) Well log is available yes
- 5) Comment: work is scheduled for the summer of 1996 to bring capacity back to original. Screens will be acidized.

Casing:

- 1) Diameter XX inches
- 2) Length #1=63 #2=62 feet
- 3) Type steel

Screen:

- 1) Type stainless steel
- 2) Length #1=10 and #2=10 feet
- 3) Static water level unknown feet

Pump:

- 1) Make westinghouse both wells
- 2) Model unknown
- 3) Size XXX
- 4) Capacity #1=600 #2=500GPM

Motor:

- 1) Make Fairbanks Morse
- 2) Model No. XXX
- 3) Horsepower rating XXX hp

DISTRIBUTION LINES OR CANALS:

- 1) Type rural water distribution lines of various

PERMIT QUALIFICATIONS AND REGULATIONS:

- 1) Soil and water permit lands agree with lands being irrigated and lands listed on permit na
- 2) Special qualifications to permit being abided by yes
- 3) All structures, wells and lands on map yes
- 4) Irrigation Questionnaires checked to determine if permit owner started irrigation by the end of construction period na

Gale N. Selken

Gale N. Selken, P.E.

Natural Resources Engineer IV

Water Rights Program.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

September 16, 1996

4367-3

5646-3

Morris Elcock, Manager
Kingbrook Rural Water System
Drawer 299
Arlington, SD 57212

Dear Mr. Elcock:

The inspection of your water use system and the inspection of the extent of application of water to beneficial use, as developed under Water Permit Nos. 4367-3 and 5646-3, has been completed. Your final water right documents, the Water Licenses, can now be issued.

Statutes require that we charge a \$50.00 fee per license for the inspection and issuance of the Water Licenses. Upon receipt of the \$50.00 fee per license from you (\$100.00 total), we will begin processing your Water Licenses.

Please remit fee to:
Department of Environment & Natural Resources
Water Rights Program
523 E. Capitol
Pierre, SD 57501-3181

Sincerely,

Cheryl F. Frost
Secretary
Water Rights Program
(605) 773-3352

NOTE: On check or money order, please specify your permit numbers. This will insure proper handling of the fee.

RECEIPT

Division of Water Rights

South Dakota Department of Environment and Natural Resources

415110

Pierre, _____ September 23, 19 96

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

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

Fee for Application for Permit No. _____ to Appropriate Water, to construct and to put water to beneficial use _____		
Fee for Application for Permit No. _____ to Appropriate Water, for Future Use _____		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. <u>4367-3</u>		
Fee for Filing Transfer Form _____	50	00
Fee for Filing Extension Request _____		
Fee for _____		

(Any Other Work Provided by Law)		
Total	50	00

By

John E. Stetson
Chief Engineer



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

APR 7 1997

4367-3

5646-3

Morris Elcock, Manager
Kingbrook Rural Water system, Inc.
Drawer 299
Arlington, SD 57212

Dear Mr. Elcock:

Enclosed are Water License Nos. 4367-3 and 5646-3. These are the final water right documents completing your process of obtaining a Water Right. Enclosed are Receipt Nos. 415110 and 415111 in the amount of \$50.00 each which you paid for the investigation and issuance of the Water Licenses.

For your information SDCL 46-6-27 requires that if the owner of an existing well, such as the wells authorized by Water Right Nos. 4367-3 and 5646-3, 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 Licenses, 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

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 4367-3

(1) Kingbrook Rural Water System, Drawer 299, Arlington, SD 57212 made Application No. 4367-3, January 2, 1979 for a water permit to divert 3.00 cubic feet of water per second from ground water (two wells - Big Sioux; Northern Skunk Creek Aquifer), Lake County, South Dakota for rural water system purposes. Permit No. 4367-3, with a priority date of January 9, 1979 was approved January 31, 1979 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before January 31, 1982 and for the application to beneficial use of said water on or before January 31, 1983.

(2) It is certified that the applicant has complied with the provisions of South Dakota State Law relating to completion of the construction of the water supply system and is entitled to divert 3.00 cubic feet of water per second for beneficial use. The location of the diversion points are Well #1 - approximately 120'W and 170'N of the E $\frac{1}{4}$ corner of Section 8, T105N, R51W (SE $\frac{1}{4}$ NE $\frac{1}{4}$); Well #2 - approximately 110'W and 225'S of the NE corner of Section 17, T105N, R51W (NE $\frac{1}{4}$ NE $\frac{1}{4}$).

- Water from the above wells is supplied with water from the well described in Water Right No. 5646-3, to a treatment plant in the NE $\frac{1}{4}$ Section 17, T105N, R51W where it is treated and distributed to rural water system customers.

(3) The applicant has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use to customers in Brookings, Clark, Hamlin, Kingsbury, Lake, McMook, Miner, Minnehaha and Moody Counties in South Dakota.

(4) Pursuant to South Dakota Water Law 46-5-30.1 the Kingbrook Rural Water System, Inc., Drawer 299, Arlington, SD 57212 the holder and/or owner of Water Permit No. 4367-3 is issued a license to appropriate water, the right to use 3.00 cubic feet of water per second from ground water (two wells) with a priority date of January 9, 1979 from the locations specified in (2) of this license, for rural water system use purposes. This license is subject to any limitations or qualifications listed in Water Permit No. 4367-3 and subject to South Dakota State Law.

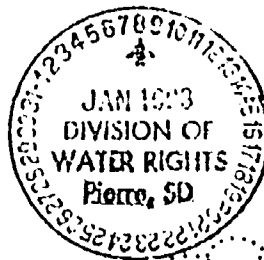

JOHN HATCH, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

APR 7 1997

date



**KINGBROOK
RURAL WATER SYSTEM**



4367-3

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.

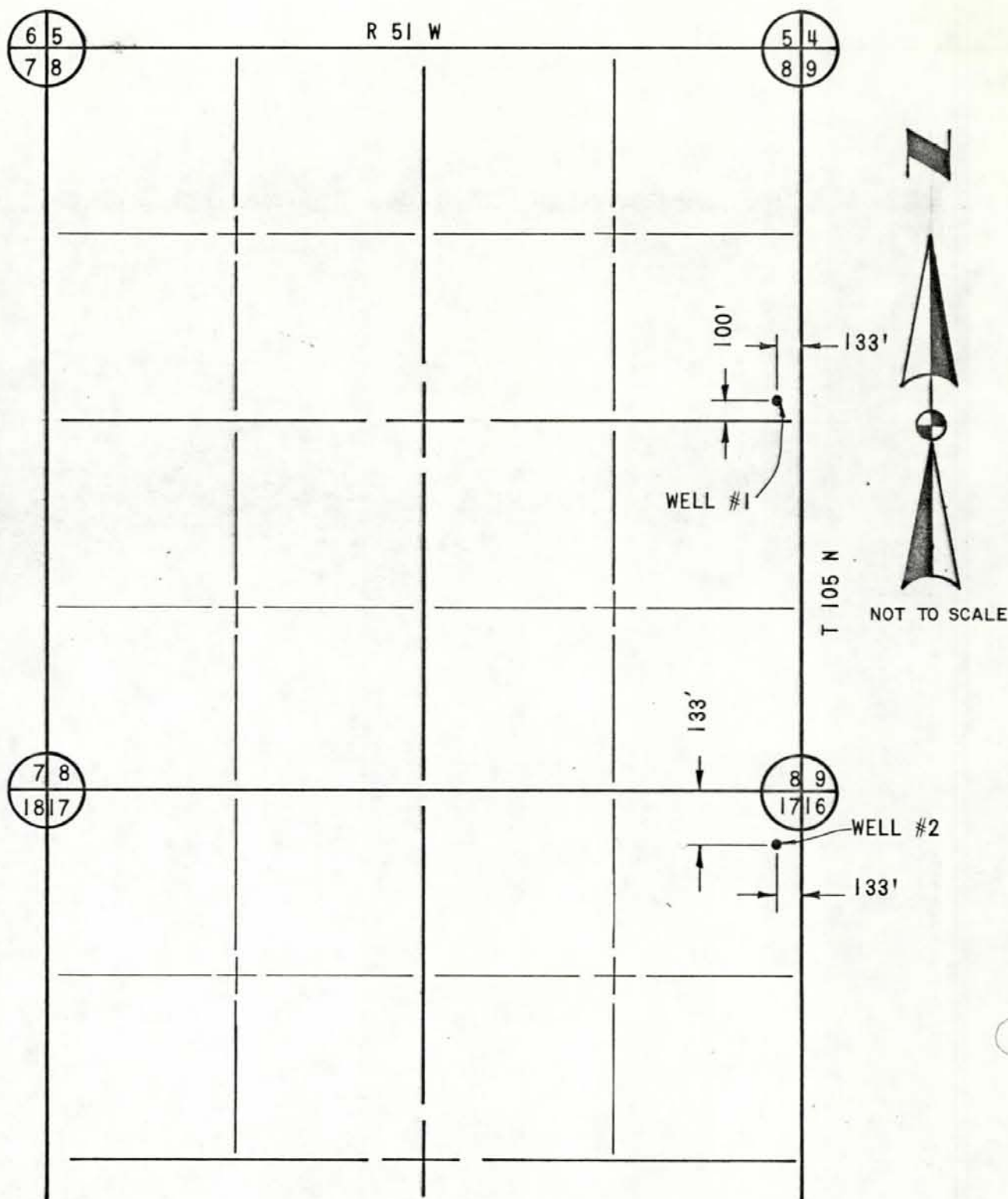
Sincerely,

Morris Elcock

Morris Elcock
Manager

ME/jk

4367-3



I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF SOUTH DAKOTA.

REGISTRATION NO 787

BY

JOHN MADDEN

DATE

12-28-78

KINGBROOK RURAL WATER
SYSTEM, INC.
PROPOSED WELL FIELD NO. 2



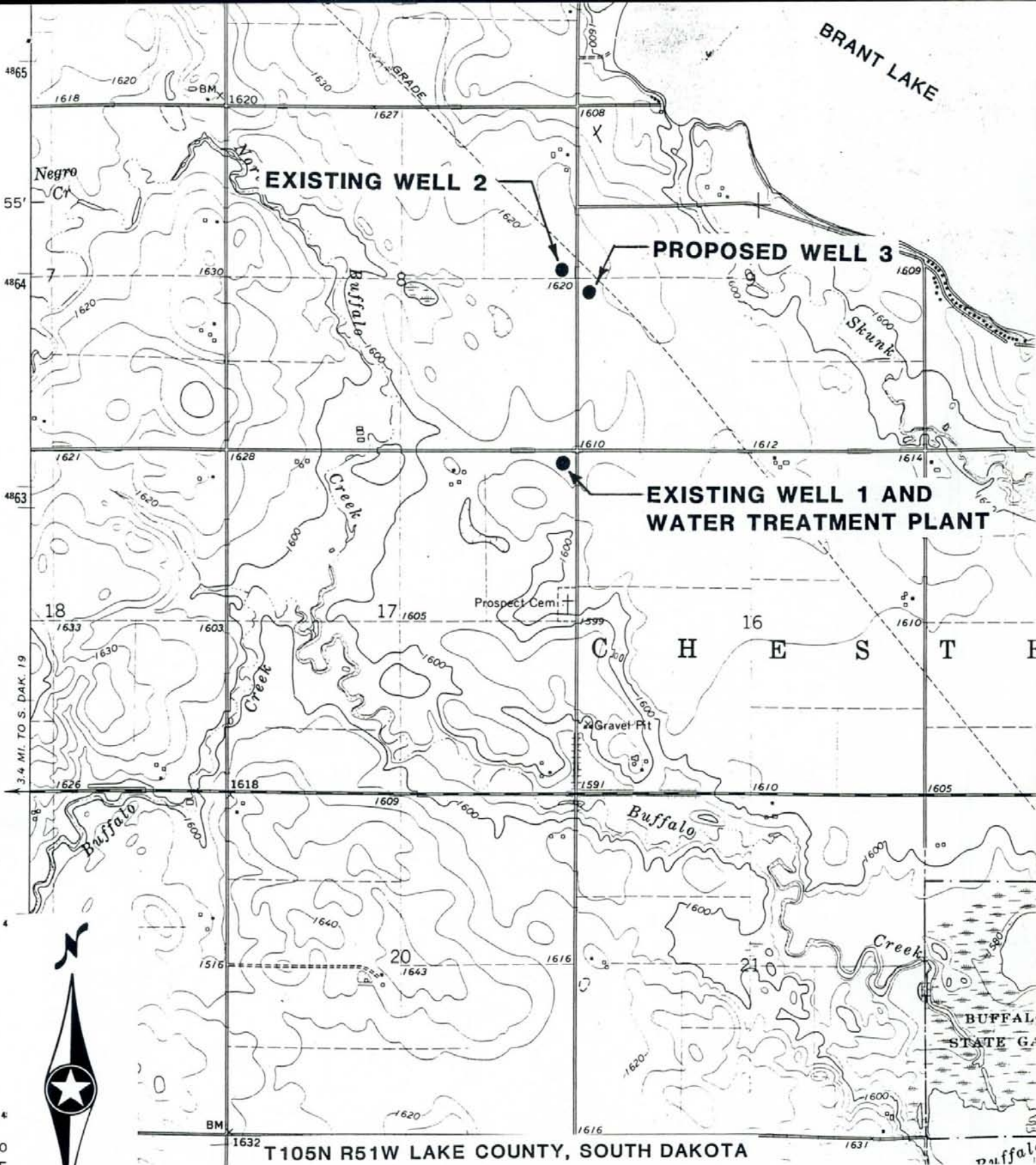
DeWild Grant Reckert & Associates Co.
Architecture Engineering Planning
Rook Rapids, Iowa
Sioux City, Iowa
Sioux Falls, South Dakota

Date
Drawn by
Approved
Revised

MAP # 3564-3

APPL # 4367-3

4367-3



T105N R51W LAKE COUNTY, SOUTH DAKOTA

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 Registration No. 3812

By Bruce Jennings Date March 19, 1992



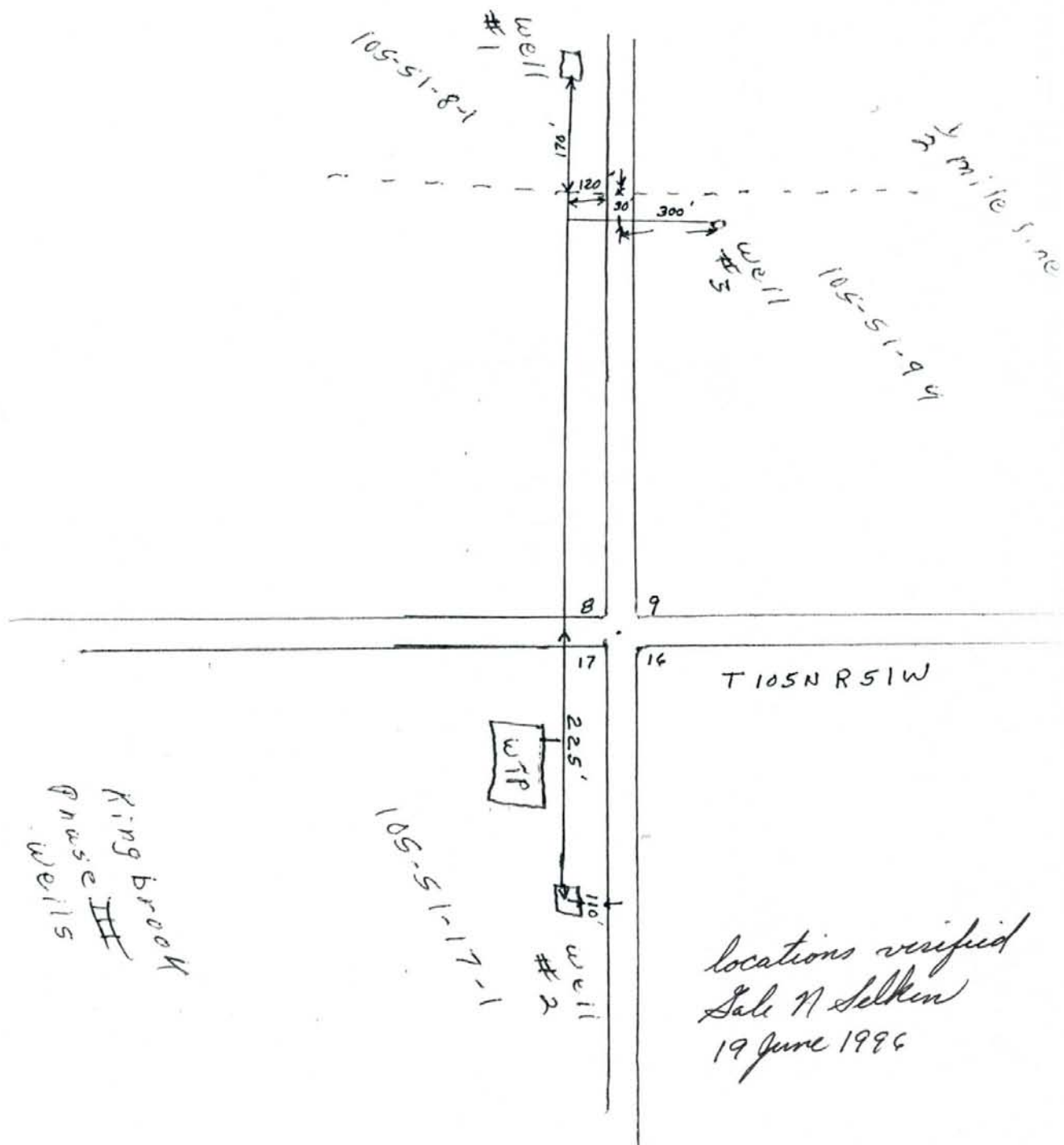
DeWitt Grant Reckert & Associates Co.
Denver, Colorado
Rocky Mountain
Sioux City, Iowa
Sioux Falls, South Dakota

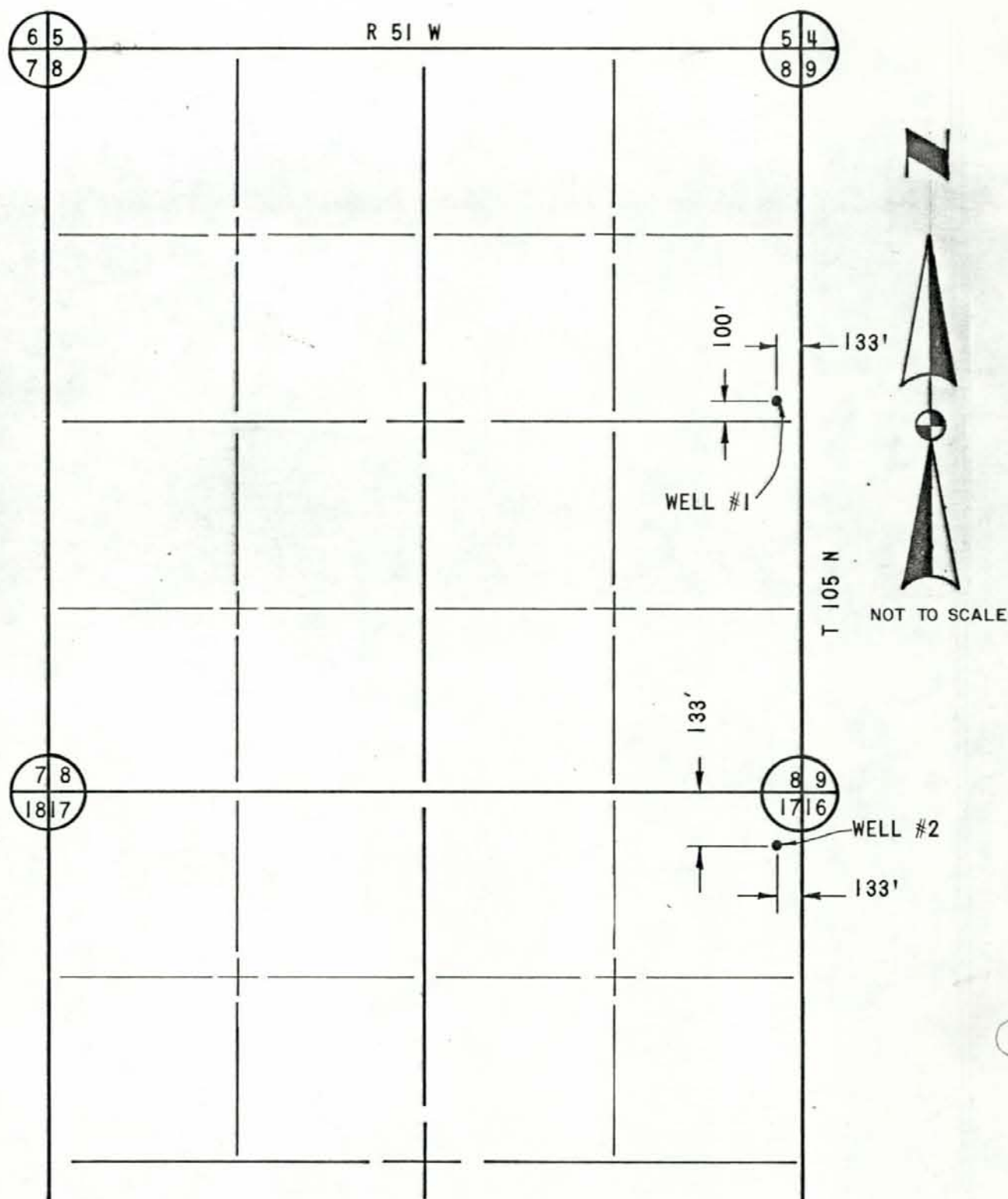
Date 3-18-92
Drawn By
Approved
Revised

KINGBROOK RURAL WATER SYSTEM
CHESTER WELL FIELD

Lowell Corbin
Supervisor

19 June 1996





I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF SOUTH DAKOTA.

REGISTRATION NO 787

BY

JOHN MADDEN

DATE

12-28-78

KINGBROOK RURAL WATER SYSTEM, INC. PROPOSED WELL FIELD NO. 2



DeWild Grant Reckert & Associates Co.
 Architecture Engineering Planning
 Rock Rapids, Iowa
 Sioux City, Iowa
 Sioux Falls, South Dakota

Date
 Drawn by
 Approved
 Revised

STANDARD BLUE, OHAMA 092877

help copy

NAPE 3368-2

APDL.
 #43673