

Water Right Number 2033-3

1. Considered January 16, 19 74
2. Name of Applicant Sioux Rural Water System, Inc., Leo Heyn, Chairman
3. Post Office Address Route #4, Watertown, South Dakota
4. Amount of water claimed .75
5. Source of water supply Ground Water - Hayti Pump site
6. Water to be used for rural water system
Acres to be irrigated --
7. Water to be diverted and used in Codington County
about N EDGE Miles of HAYTI
8. Proof of Publication
Received December 31, 1973
Not received _____
9. Application
Approved _____
Subject to _____
Not approved _____
Action deferred _____

10. Remarks:

No. 2033-3Map No. 1441-3 Water Division No. 3 BIG SIOUX RIVER District 1
(Blanks to be filled by the Engineer for the W. R. C.)

APPLICATION FOR PERMIT

DEC 12 1973
9:12 AM
STATE WATER RIGHTS DIV.
L2371 C-101 0000

To Appropriate Water within the State of South Dakota

(NOTE - Draw a line through items not applicable)

1. Name of Applicant Sioux Rural Water System, Inc. (Leo Heyn, Chairman)
 Post-office address Route 4, Watertown State South Dakota
 If a corporation show date and place of incorporation May 10, 1972, South Dakota
2. Method of accomplishing work (contract, employment of others, or by direct labor) Contract
3. Name of diversion work Hayti Pump Site
4. Amount of water claimed (cubic feet per second) 0.75
5. Source of water supply Groundwater aquifer on north city limits of Hayti
6. Location of point of diversion SW1/4, Sec. 21, T114N, R53W (see attached plat)

County Hamlin

7. Annual period or periods during which water is to be used 365 days per year
8. Use to be made of water (irrigation, industrial, municipal, commercial, recreation, etc.) Domestic (Rural Water System)

XXXXXXXXXXXX

XX

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 3 years. Additional time required to complete application of water to the proposed beneficial use 0 years.
11. Choice of newspaper for Notice of Intent to Appropriate Water publication Herold Enterprise - Hayti
12. Principal Features of the Proposed Water Supply System.

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

Two wells will be constructed as shown on the attached plat

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

An underground pipeline will be constructed

C. Works proposed to apply water to beneficial use.

Individual users will provide their own domestic distribution systems

Estimated Total Cost \$ 1,000,000

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 Codington) ss.I, Leo Heyn

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

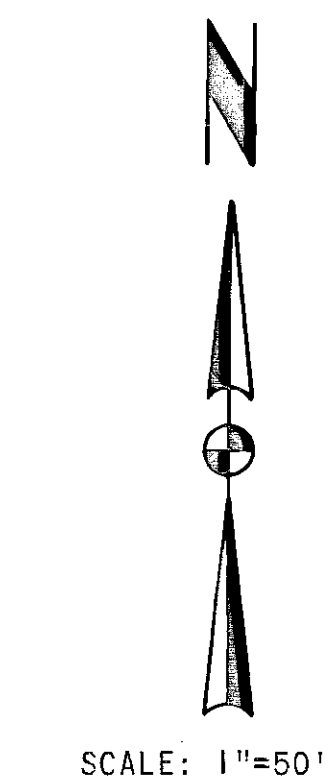
Leo Heyn

Subscribed and sworn to before me this

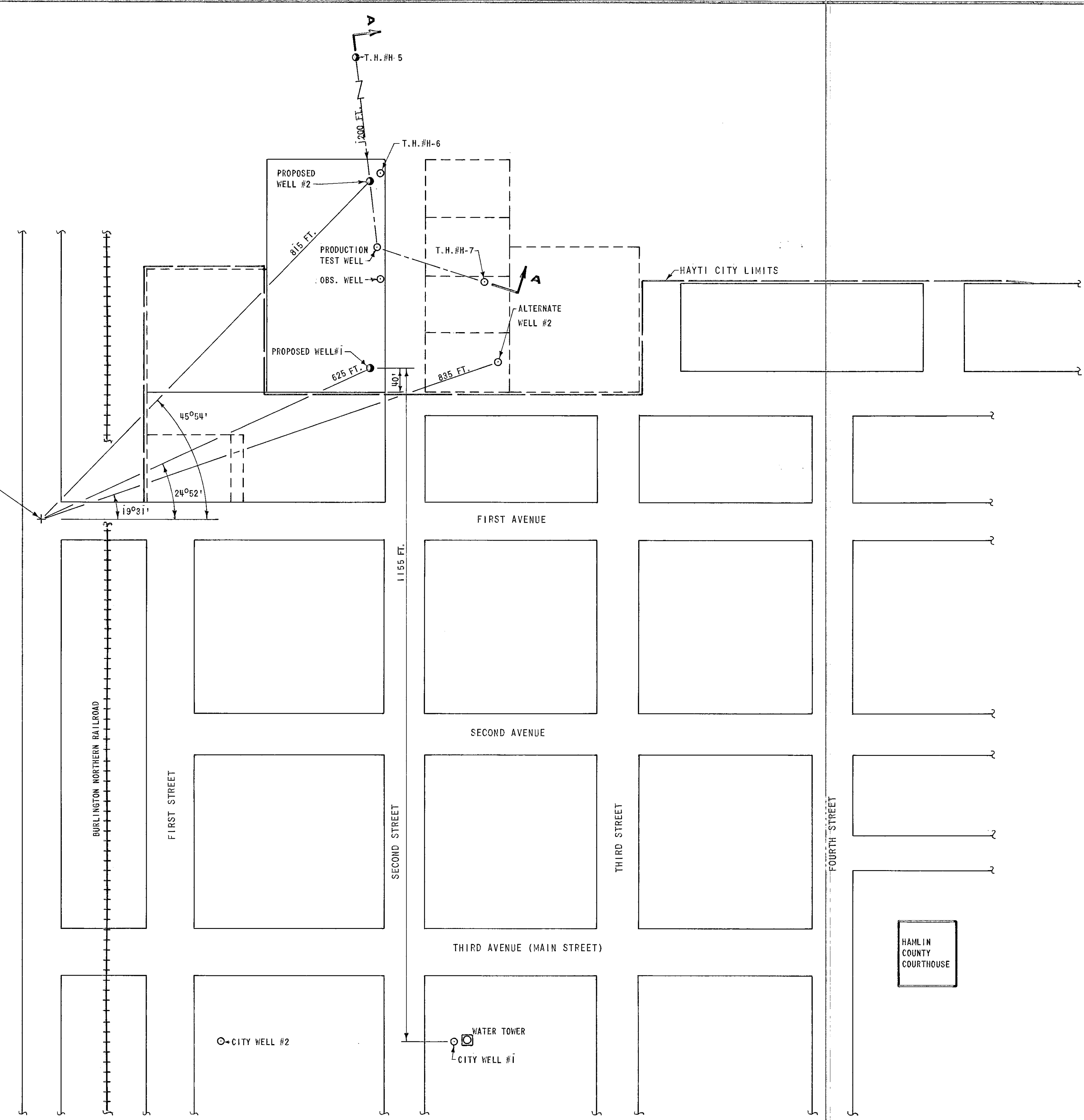
10th

day of

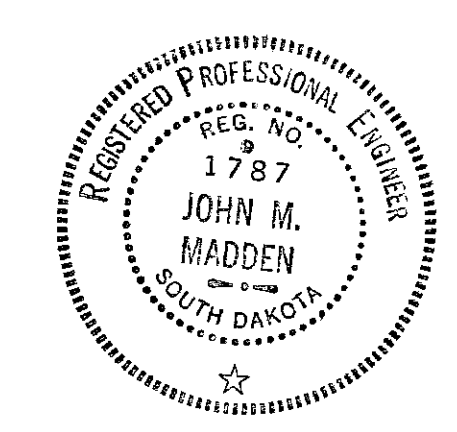
December1973William W. Toubak
Notary Public (or other qualified officer)



R 53 W
T 114 N
20 21
29 28



CITY OF HAYTI



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

By John M. Madden, S. D. Reg. No. 1787

Date Dec. 5, 1973

County of Lyon
State of Iowa

Subscribed and sworn to before me on the 13 day of December 1973.

Mary Rose White
Notary Public

HAYTI PUMP SITE		
REVIEWED:	DE WILD GRANT RECKERT & ASSOCIATES CO.	JOB NO.
	ENGINEERS • ARCHITECTS • PLANNERS	2246
	ROCK RAPIDS, IOWA SIOUX CITY, IOWA	
AS BUILT:	SIOUX RURAL WATER SYSTEM INC.	SHEET NO.
	DWN. BY: T.J.N. APP'D BY: J.M.M. DATE:	1/1

MAP No 1441-3 (APPL No 2033-3)

WATER RIGHT APPLICATION APPROVAL

The Water Resources Commission hereby approves Water Right Application No. 2033-3

SIOUX RURAL WATER SYSTEM, INC. ROUTE 4, WATERTOWN
(Applicant) (Post Office Address)

SOUTH DAKOTA With the following modifications:
(State)

The ~~irrigation~~ well approved under this Permit will be located near domestic wells and other ~~irrigation~~ wells which may obtain water from the same aquifer. The ~~irrigation~~ well owner, under this Permit, shall control his ~~irrigation~~ withdrawals so there is not a reduction of needed water supplies in existing domestic wells or in ~~irrigation~~ wells having prior water rights.

Date of first receipt of application DECEMBER 12 19 73

Date of return to applicant for correction, amendments or changes required — 19 —

Date of receipt of corrected application — 19 —

Approved JANUARY 16 19 74, Recorded in Book 12 Page 300

WATER RIGHT PERMIT NO. 2033-3

The Water Resources Commission hereby grants and issues this Water Right Permit No. 2033-3 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 DECEMBER 12 19 73
2. The equivalent of at least one-fifth of the work above specified is to be completed on or before JULY 16 19 75
3. The whole of said work is to be completed on or before JANUARY 16 19 77
4. The limit of time from proof of beneficial use of water appropriated in accordance herewith is JANUARY 16 19 77
5. The water appropriated shall be used for the purpose of 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 .75 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~~ ~~irrigation~~ ~~and if for the irrigation purpose, 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~~ used for rural water system JANUARY 16 19 77; said water to be used during the following described annual period: CONTINUOUSLY

Witness my hand this 21ST day of JANUARY 19 74

WATER RESOURCES COMMISSION

By: Donald Driscoll
Chief Engineer, Executive Officer

Certificate of Construction issued — 19 —

Water License Issued — 19 —

DEC 12 1973
7:15 AM

STATE WATER RIGHTS COM.
PIERRE SOUTH DAKOTA

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

D. Well Information or Estimates

- (1) Drill Hole, Diameter 24 in., Depth 60 ft. (2 required)
- (2) Casing, Type steel, Diameter 12 in. Thickness 0.322 in.
(wood, concrete, steel, etc)
- (3) Perforated Screen.
Type slotted, Diameter 12 in., Length 15 ft.
- (4) Gravel Pack. Thickness 6 in., Length of gravel pack 35 ft.

XXXXXXXXXXXXXXXXXXXX

- (1) Surface dimensions _____, Depth _____

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 medium sand

Depth to top of water bearing material 5 ft.

Depth to bottom of water bearing material 60 ft.

Thickness of water bearing material 55 ft.

Depth to water (ground surface to water level) 25 ft.

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

On same owner's property _____ rds. On property owned by others 70 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.

Leo Stoyan
Signature of Applicant

2033-3

Publish first publication, on or before January 3, 1974

NOTICE
INTENT TO APPROPRIATE WATER

Pierre, South Dakota 57501

December 13, 1, 1973

Notice is hereby given that the Sioux Rural Water System, Inc.
whose post office address is Watertown, South Dakota, has made an application in accordance
with the provisions of the water laws of South Dakota for a permit to appropriate for beneficial use
.75 cubic feet of water per second of time from the ground water through the
Hayti Pump Site, the point ^{of} are of diversion of which is to be located in the _____

SW 1/4

of Section 21, Twp. 114N, Range 53W. Said water to be used for the purpose
of providing ~~irrigation on the following described land:~~
domestic water supplies to users in the Sioux Rural Water System

This application No. 2033-3 will be considered by the Water ~~Resources~~ ^{Rights} Commission at their office at
Pierre upon the 16th day of January, 1974, at 2:30 P. M. All interested
persons may appear and be heard.

~~WATER RESOURCES COMMISSION~~
WATER RIGHTS COMMISSION

By:

BURTON P. JONES, Water Rights Specialist

3PJbv

cc: Leo Heyn, Chairman, Sioux Rural Water System, Inc., Route 4, Watertown, S.D.
57201

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County Hawlin) ss.

I, Darlene Shearer hereby

certify that the annexed printed copy of Notice of Intent to Appropriate

Water was taken from the Herald Enterprise

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

ald Enterprise of Hayti

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

December 20, 1973

December 27, 1973

Darlene Shearer
(Signature)

Secretary

(Title)

December 27, 1973

(Date Signed)

NOTICE INTENT TO APPRO-
PRIATE WATER

Merre, South Dakota

December 13, 1973

Notice is hereby given that
the Sioux Rural Water System,
Inc. whose post office address
is Watertown, South Dakota, has
made an application in accor-
dance with the provisions of the
water laws of South Dakota for
a permit to appropriate for bene-
ficial use .75 cubic feet of water
per second of time from ground
water through the Hayti Pump Site
the points of diversion of which
are to be located in the SW 1/4
of Section 21, Twp. 114N, Range
53W. Said water to be used
for the purpose of providing do-
mestic water supplies to users
in the Sioux Rural Water System.

This application No. 2033-3
will be considered by the
Water Rights Commission at their
office at Merre upon the 16th
day of January, 1974, at 2:30
p.m. All interested persons may
appear and be heard.

By:
/s/ Burton F. Jones, Water
Rights Specialist. 9, 10

DEC 31 1973

Glenn R. Andersen

Subscribed and sworn to me this 27-day of Dec-- , 19-73

Glenn R. Andersen

Notary Public, State of South Dakota

My commission expires May 23, 1981

REPORT OF WATER EXPLORATION
AND AQUIFER TESTING

SIOUX RURAL WATER SYSTEM, INC.

Job No. 2246

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

BY John M. Madden Reg. No. 1787
John M. Madden, P.E.

Date 1-10-74

DEWILD GRANT RECKERT & ASSOCIATES COMPANY
ENGINEERS & ARCHITECTS
ROCK RAPIDS, IOWA
SIOUX CITY, IOWA
SIOUX FALLS, SOUTH DAKOTA

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6. Drillers Logs

SECTION III - HAYTI PUMP SITE

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4. Drawdown and Recovery Curves
5. Water Analysis of Samples Collected During Pumping
6. Drillers Logs

SECTION I

DEWILD GRANT RECKERT & ASSOCIATES CO.
ENGINEERS & ARCHITECTS
ROCK RAPIDS, IOWA

Sioux Rural Water System, Inc.

Purpose:

The purpose of this report is two-fold. First, to provide a permanent record of data collected in the water exploration and aquifer testing performed in order to evaluate potential water supplies for the Sioux Rural Water System, Inc. Secondly, the report is to provide supplementary information to the South Dakota Water Resources Commission for their use in processing water rights applications for the Sioux Rural Water System.

General Project Description:

The project consists of a rural water system serving approximately 470 users in the Watertown-Hayti-Clear Lake area of Codington, Hamlin and Deuel Counties. The system will draw its water from up to six wells located in two primary water source areas, has five water towers, three booster stations and approximately 290 miles of pipe. It is anticipated that construction will start in the summer of 1974.

General Location:

General location of the proposed project is shown on attached Figure 1.

Water Use Data:

Sioux River Well Field - A well field will be located near the Sioux River approximately 4½ miles south of Watertown and will provide water required for the northeast area of the project. Four wells at this location will provide water to three elevated storage towers having a total capacity of 200,000 gallons. The ultimate design usage from this source is 328,000 gallons per day.

Hayti Well Field - Two wells will be located adjacent to the north corporate limits of the Town of Hayti and will provide water to two water towers serving the western portion of the project area. Storage capacity of the two towers will be 150,000 gallons. Total ultimate design usage is 280,000 gallons per day.

Project Objective:

The objective of this rural water system is to provide a water supply for the livestock and other domestic needs of approximately 470 individual farm users and to provide water to meet the needs of the towns of Bryant, Hazel and Kranzburg.

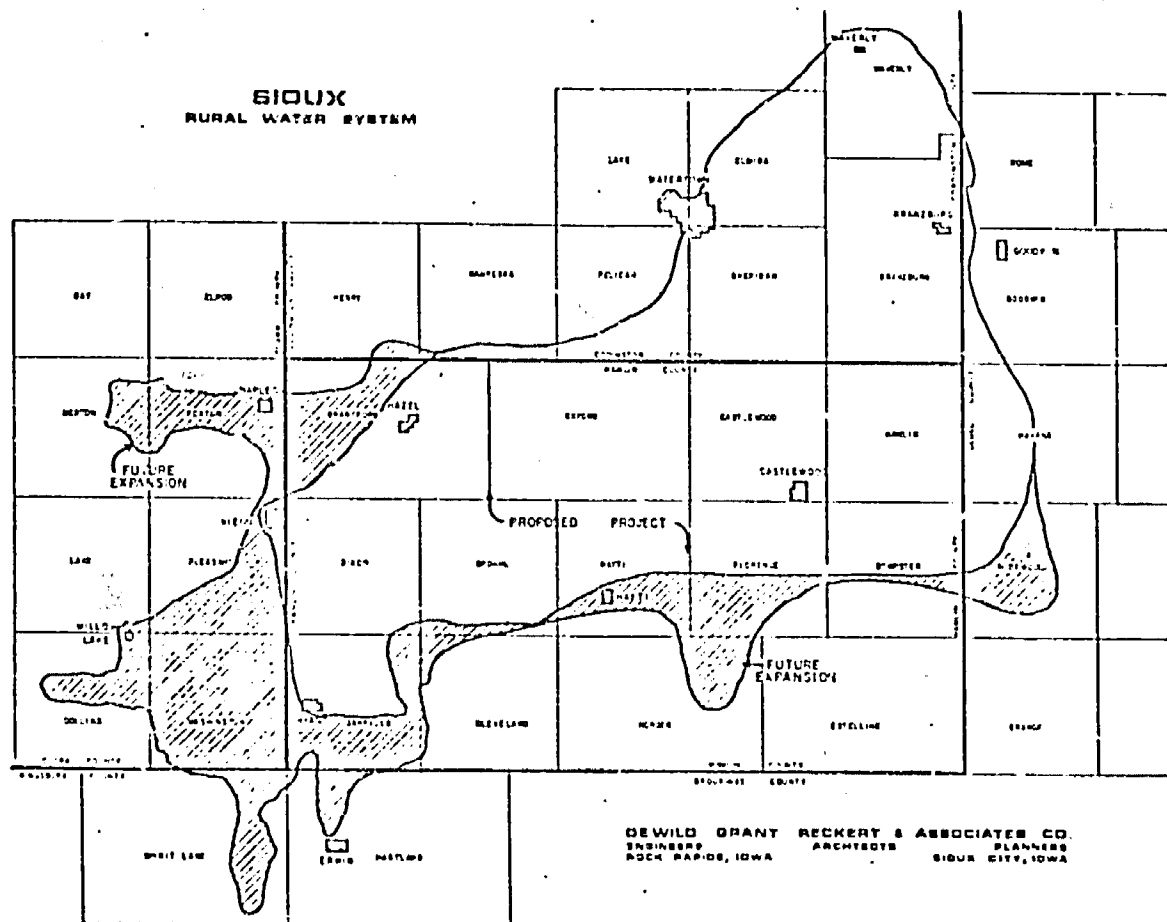


Figure 1. General Project Area Map

Table I. Summary of Well Inventory Data (Samples Collected 9/16 & 9/17, 1973)

Sample No.	Name	Location	Hardness- Iron- Manganese Nitrate-				Remarks
			CPG	Fe ppm	Mn ppm	N ppm	
1.	Ted Svareri	NE1/4, NW1/4, 16-114-52	31			0	
2.	H. Olson-House	NW1/4, SW1/4, 16-114-52	53			21	
3.	H. Olson-Barn	NW1/4, SW1/4, 16-114-52	33				Very poor cover, adjacent to feedlot.
4.	Loel Trumm	E1/4 Cor. 20-114-52	19	tr.		0	
5.	Kopang-Farm	SE Cor., SW1/4, 18-114-52	72	5			
6.	C. Sour	SE1/4, 24-114-53	60				
7.	Ted Schaefer	SW1/4, 19-114-52	50				
8.	Rector (New House)	SW1/4, NW1/4, NW1/4 21-114-52	17	0.4 est.			46' deep, 28' water, 26' of sand
9.	Teesch Farm	SW Cor., SW1/4, SE1/4 15-116-52	40	5		5	H ₂ S small
10.	Little Farm	NE Cor., 20-116-52	24	tr.	0	8	Near obs. well S-5
11.	Cock Farm	NE1/4, NE1/4 33-116-52	13	0.0	0.1	5	

NOTE: Analysis were made with a field test kit and should be verified by laboratory analysis for further use.

SECTION II

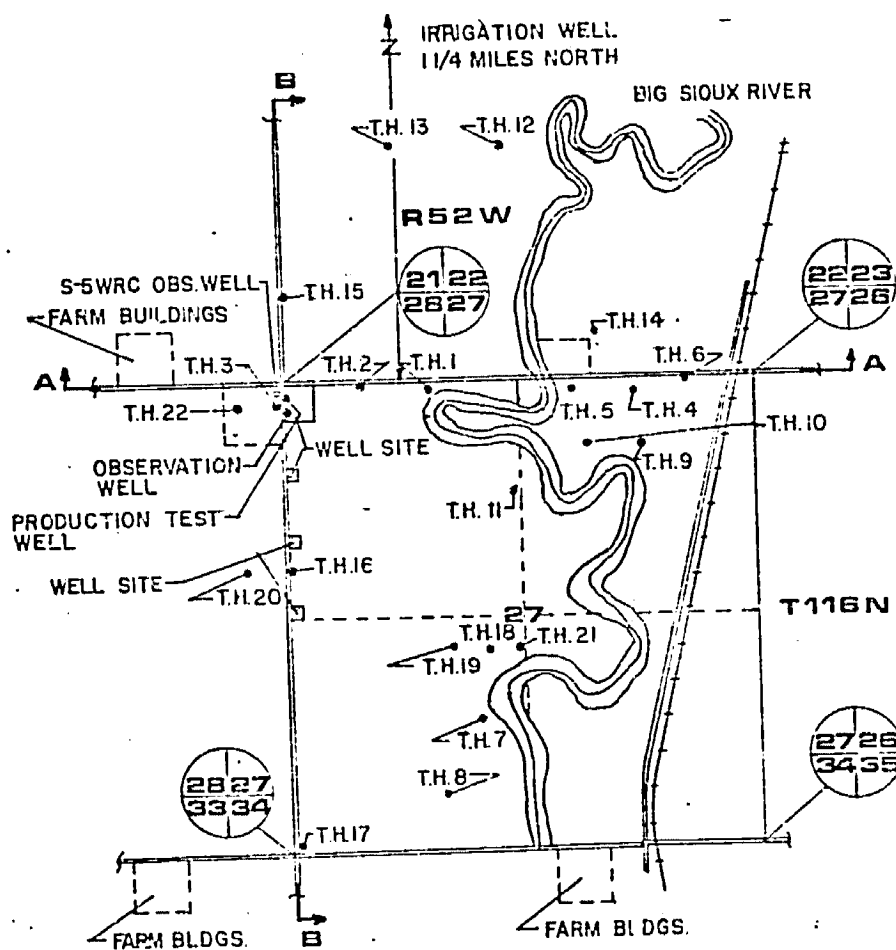
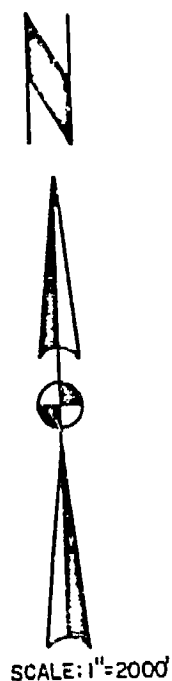


FIGURE 2 GENERAL LOCATION MAP OF TEST HOLES AND PROPOSED WELLS AT THE SIOUX RIVER PUMP SITE

WEST LINE SEC. 27

EAST LINE SEC. 27

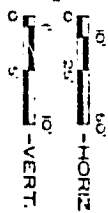
FIG. 5 ESTIMATED PROFILE THRU TEST HOLES 22, 3, 2, 1, 6, 4, 56

SIOUX RIVER PUMP SITE

SIOUX RURAL WATER SYSTEM, INC.

OCT. 24 & 25, 1973 JOB NO. 2240

SCALE:



SECTION A-A

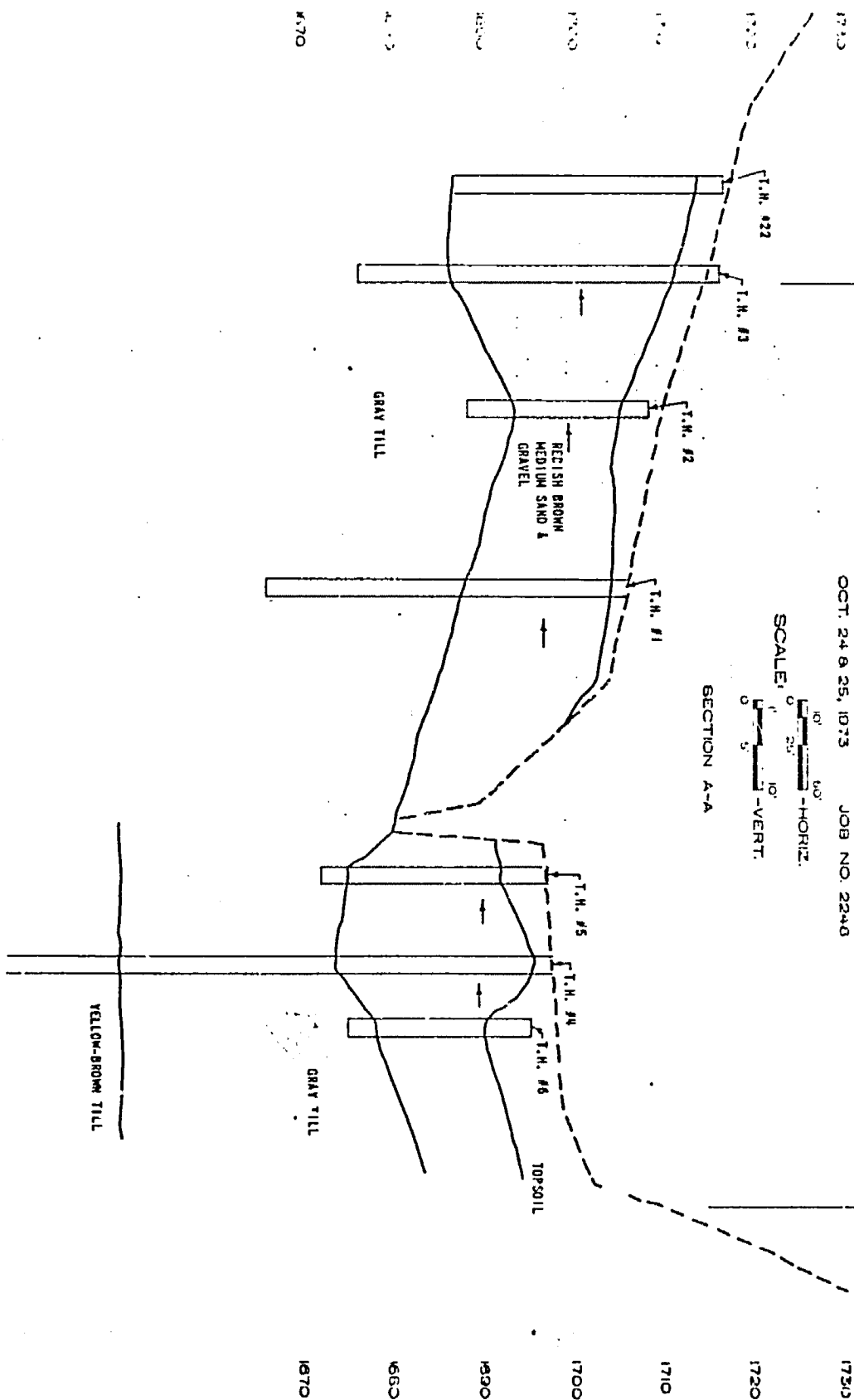


FIG. 4. ESTIMATED PROFILE THRU TEST HOLES 15, 3, 16, 6, 17

SIOUX RIVER PUMP SITE

SIOUX RURAL WATER SYSTEMS, INC.

OCT. 24 & 25, 1973 JOB NO. 2246

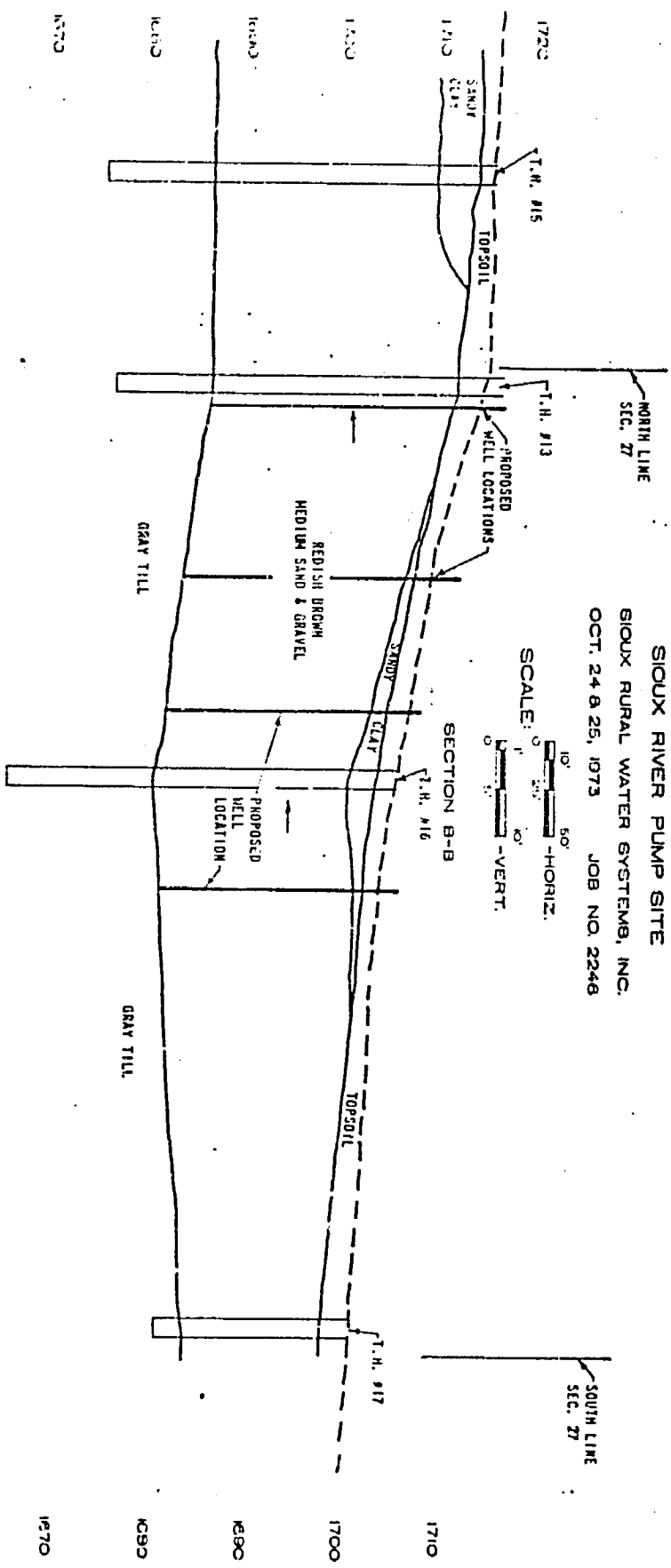
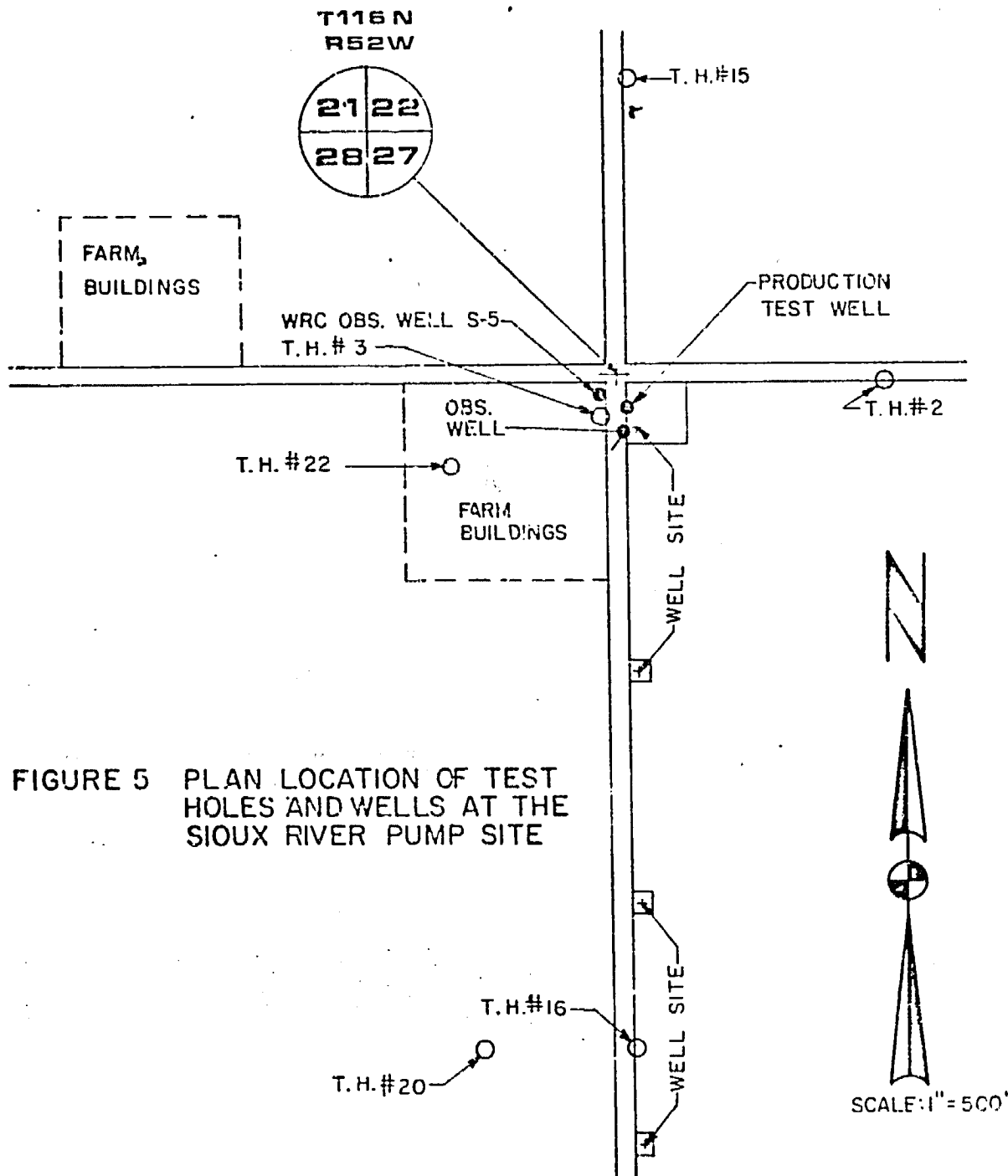


Table 2. Summary of Water Analysis of Samples Collected
from Test Holes at the Sioux River Pump Site

Test Hole Number	S-4	S-5	S-16	S-18
Date Collected	10-25-73	10-24-73	10-25-73	10-26-73
Nitrate Nitrogen as ppm(N)	0	0	0	0
Hardness, gpg	42	48.5	19	28
Iron, (Fe) ppm	0.15	0.10	0.02	1.15
Manganese, (Mn) ppm	0	1.7	0.05	0.7

NOTE: Analysis were made with a field test kit and should be
verified by laboratory analysis for further use.

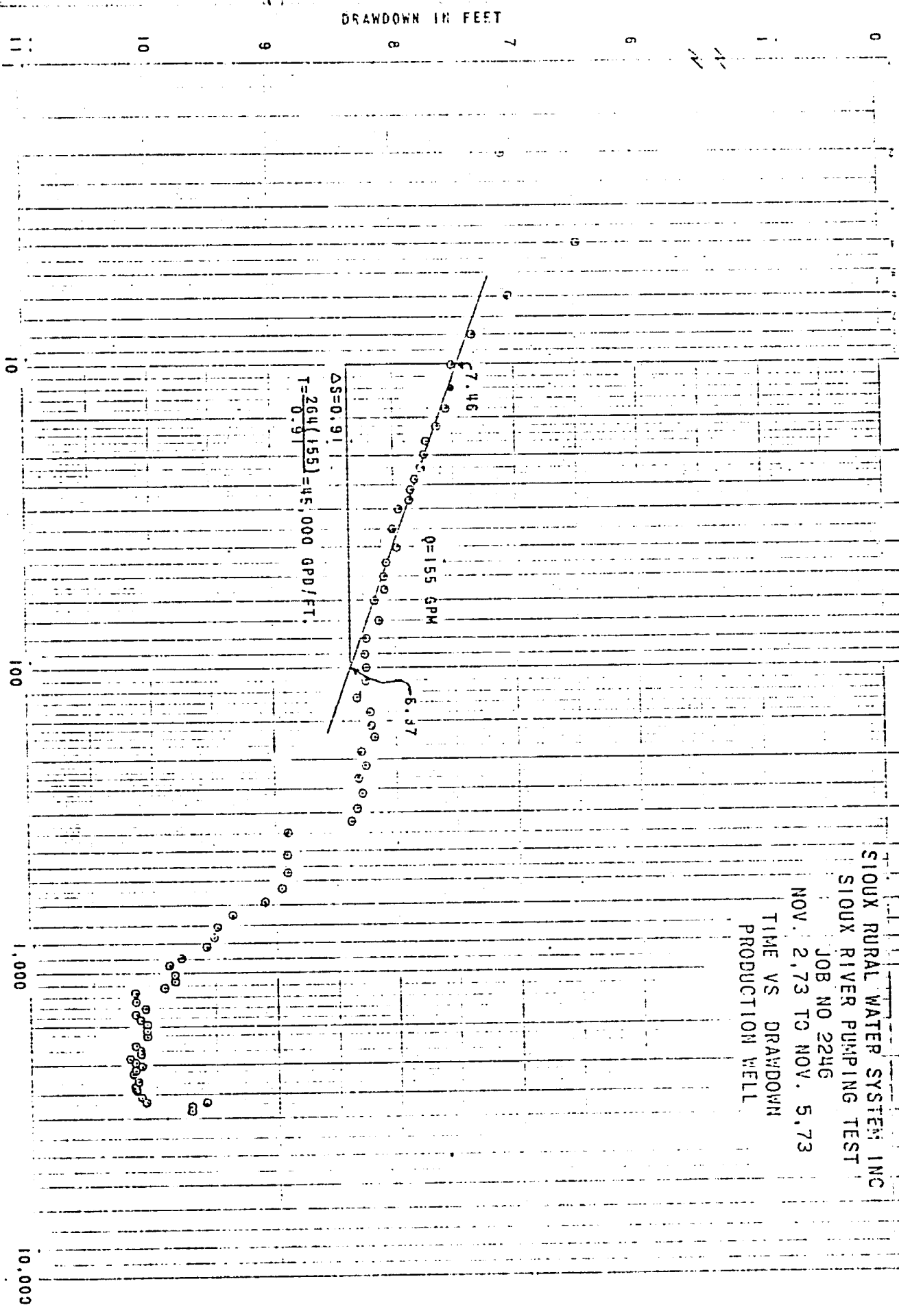


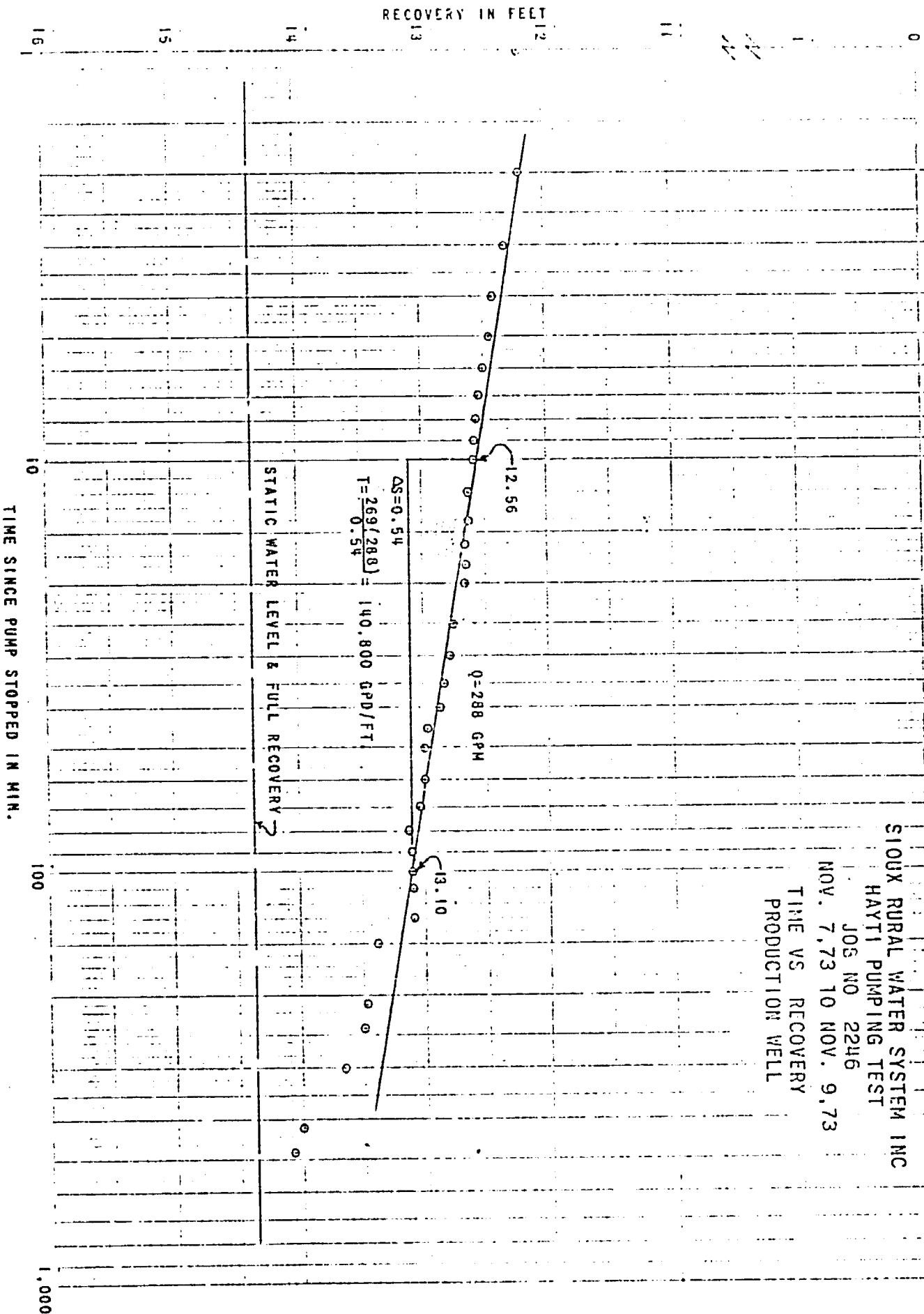
DE WILD, GRANT, RECKERT & ASSOCIATES CO. - ENGR'S. & ARCH'S.
 ROCK RAPIDS, IOWA SIOUX FALLS, S. DAK. SIOUX CITY, IOWA

Date 1/9/74
 File No. 224C

SILOX RURAL WATER SYSTEM INC
SILOX RIVER PUMPING TEST
JOB NO 2246
NOV. 2, 73 TO NOV. 5, 73

TIME VS DRAWDOWN
PRODUCTION WELL



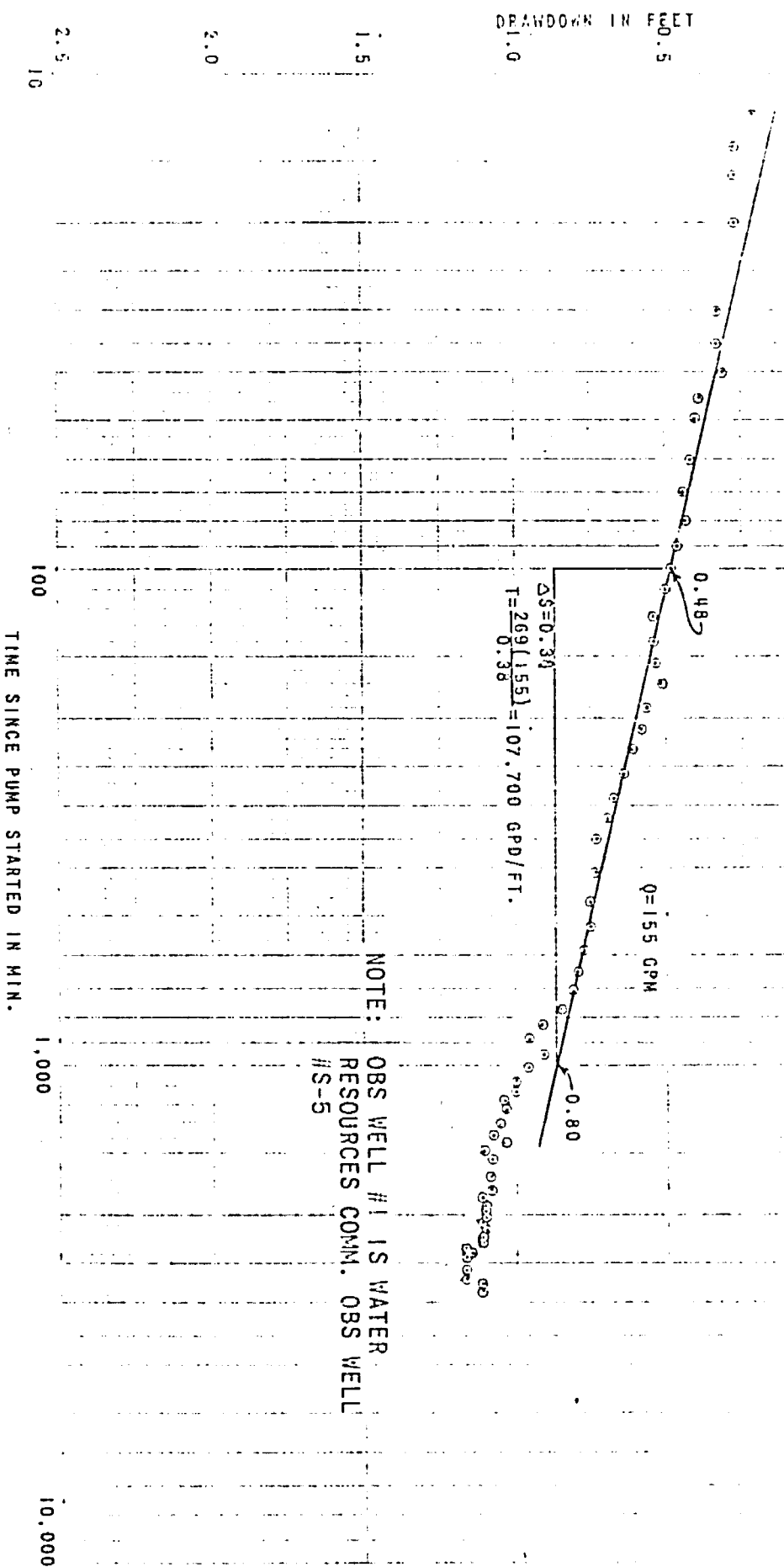


SIoux RURAL WATER SYSTEM INC
HAYTI PUMPING TEST
JOS NO 2246
NOV. 7, 73 TO NOV. 9, 73
TIME VS. RECOVERY
PRODUCTION WELL

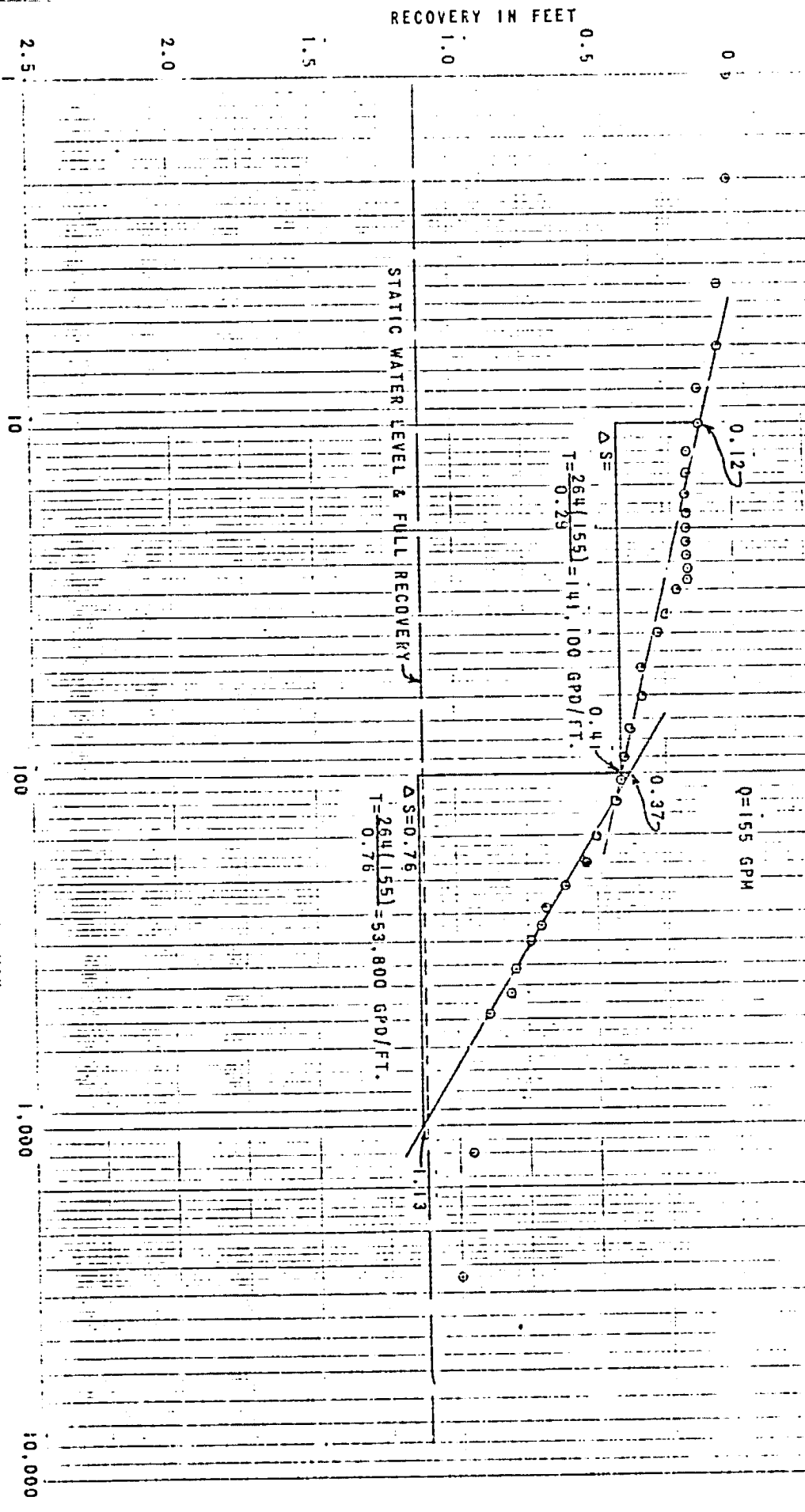
SIOUX RURAL WATER SYSTEM INC
 SIOUX RIVER PUMPING TEST

JOB NO. 2246
 NOV. 2.73 TO NOV. 5.73
 TIME VS DRAWDOWN
 OBSERVATION WELL #1

DISTANCE FROM PRODUCTION WELL = 51.7 FT



SIoux RURAL WATER SYSTEM INC
SIoux RIVER PUMPING TEST
JOB NO 2246
NOV. 2, 73 TO NOV. 5, 73
TIME VS RECOVERY
OBSERVATION WELL #1
DISTANCE FROM PRODUCTION WELL = 51.7 FT.



SIOUX RURAL WATER SYSTEM INC
SIOUX RIVER PUMPING TEST

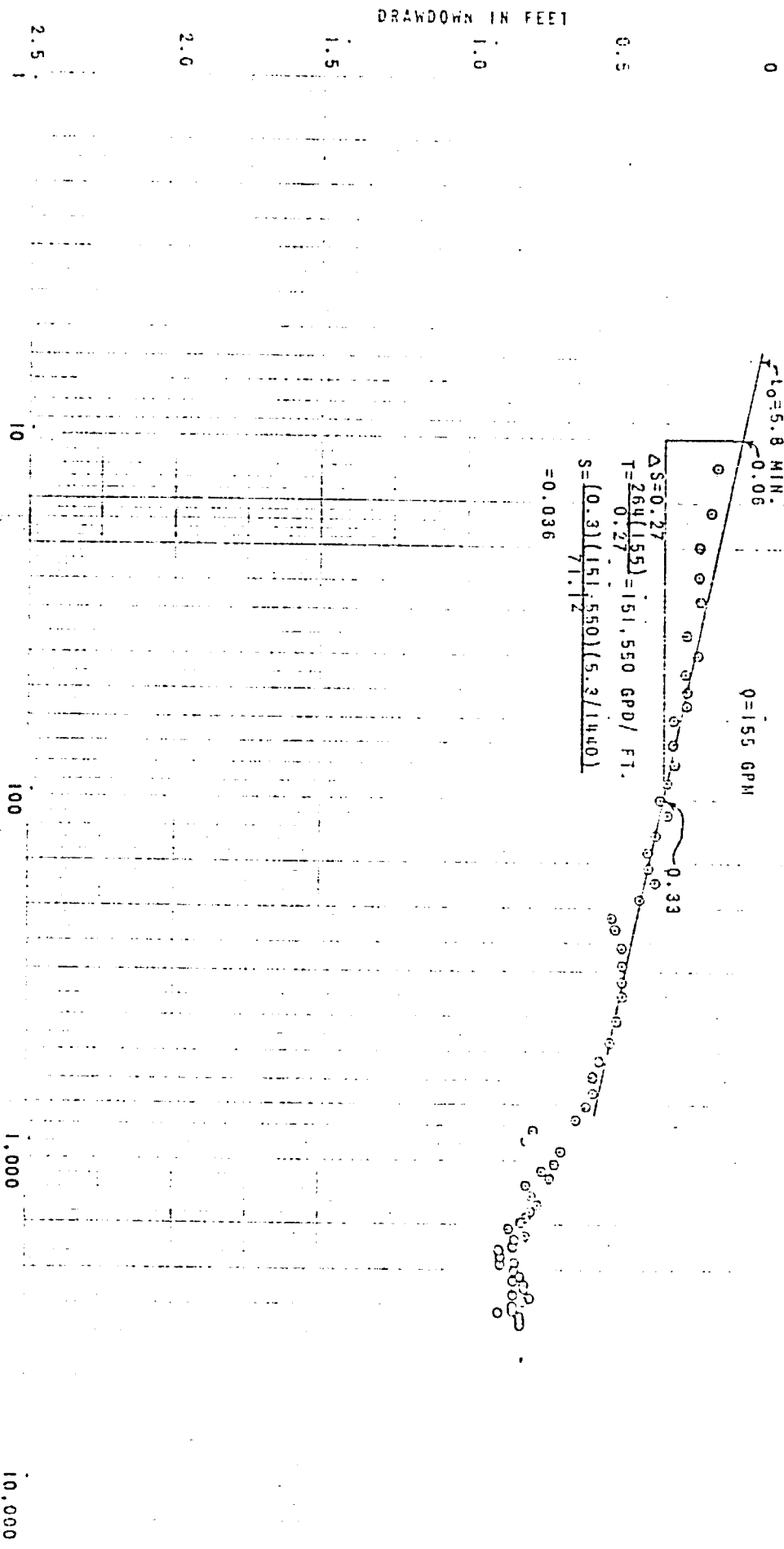
JOB NO 2246

NOV. 2.73 TO NOV. 5.73

TIME VS DRAWDOWN

OBSERVATION WELL #2

DISTANCE FROM PRODUCTION WELL = 71.1 FT.



SIoux RURAL WATER SYSTEM INC
 SIoux RIVER PUMPING TEST
 JOB NO 2246
 NOV. 2, 73 TO NOV. 5, 73
 TIME VS RECOVERY
 OBSERVATION WELL #2

RECOVERY IN FEET

STATIC WATER LEVEL & FULL RECOVERY

$$T = \frac{264(155)}{0.47} = 87,000 \text{ GPD/FT.}$$

Q = 155 GPM

0.20

0.75

TIME SINCE PUMP STOPPED IN MIN.

2.5

2.0

1.5

1.0

0.5

0

10

100

1,000

10,000

Table 3. Summary of Water Analysis on Samples Collected During
Test Pumping of the Sioux River Pump Site

<u>Sample No.</u>	SW-0	SW-1	SW-2	SW-3	SW-4	SW-5
Hours after pumping started	0	9	17	25	33	41
Nitrate Nitrogen as ppm (N)	2.5	5	6	5	5	5
Hardness, gpg	21.6	22.2	22.5	22.8	22.8	23.4
Iron, (Fe) ppm	0.03	0.03	0.02	0.02	0.02	0.0
Manganese, (Mn) ppm	0.0	0.0	0.05	0.0	0.0	0.05

NOTE: Analysis were made with a field test kit and should be verified by laboratory analysis
for further use.

SOUTH DAKOTA STATE DEPARTMENT OF HEALTH
Division of Sanitary Engineering
Pierre, South Dakota

CHEMICAL WATER ANALYSIS REPORT

City or Town Watertown, South Dakota Date Received 11/21/73
Sample Collector's Name John Madden Lab. Number 731793
Date Collected 11/19/73 Date Reported 12/5/73
Results Reported To: Copies To:
John Madden
DeWild, Grant, Reckert & Associates
315 First Avenue
Rock Rapids, Iowa 51246

W-11 site about 5 miles south of Watertown, near Sioux River.

FIELD DATA

Name of Public Water Supply Proposed supply for Sioux Rural Water System
Well Source Sampled: Name Depth test well Diameter Date Built
Other Source Sampled: Name Date Built
Legal Description of Source Site
Raw or Treated Sample Raw Treatment Processes
Additional Information, Remarks
Source (pumped 48 hours) (flows) at gallons per minute
Field Tests: Temperature °C Iron pH
Turbidity Alkalinity, P. M. Hardness

LABORATORY ANALYSIS RESULTS

(Results in parts per million unless otherwise stated)

Specific Conductance at 22.5 °C 650 micromhos per centimeter
Total Solids Dissolved Solids 502 Iron as Fe 0.16
Alkalinity as CaCO₃ P. 0 T or M 254.0 pH 8.30
Potassium as K 2.00 Nitrate as N 6.49
Sodium as Na 13.40 Fluoride as F 0.23
Calcium as Ca 83.40 Chloride as Cl 6.00
Magnesium as Mg 42.40 Sulfate as SO₄ 100.00
Manganese as Mn 0.01 Bicarbonate as HCO₃ 309.90
Calculated Hardness as CaCO₃ 383 ppm 22.4 gpg

Analyst Reported by

REPORT OF ANALYSIS
Water Quality Laboratory
Water Resources Research Institute
South Dakota State University
Brookings, South Dakota 57006

Submitted by: John Madden Date Rec'd November 15, 1973
 Address De Wild, Grant Beckert & Assoc Sample No. 72-701
Rock Rapids, Iowa Identification Well-10' S1-5
51246 Nov., Dec. 27, T 1167, R 527

WATER ANALYSIS

Calcium (Ca)	168	ppm*	8.40	me/l**
Magnesium (Mg)	0	ppm	0.00	me/l
Sodium (Na)	16	ppm	0.70	me/l
Potassium (K)	3	ppm	0.08	me/l
Sulfate (SO ₄)	102	ppm	2.12	me/l
Nitrate (as N)	6.00	ppm	0.43	me/l
Chloride (Cl)	3.00	ppm	0.08	me/l
Bicarbonate (HCO ₃)	351	ppm	5.76	me/l
Carbonate (CO ₃)		ppm		me/l
Iron (Fe)	0.05	ppm		me/l
Fluoride (F)	0.26	ppm		me/l
Hardness (EDTA as CaCO ₃)	420	ppm	25	g.p.g.***
Alkalinity (Methyl Orange)	288	ppm (as CaCO ₃)		
Alkalinity (Phenolphthalein)	0	ppm (as CaCO ₃)		
Electrical Conductivity	711	micromhos per cm at 25° C.		
Sodium Adsorption Ratio	0.34			
Sodium	7.62	% of cations		
Residual sodium carbonate	0.00	me/l		
pH	7.93			
Others: Manganese (Mn)	0.00	ppm		

*ppm=parts per million

***g.p.g.=grains per gallon

**me/l=milliequivalents per liter

COMMENTS: Total solids 480 ppm
 Total cations 9.18 me/l
 Total anions 8.39 me/l

By: Shirley Hatten

Service Performed

Amount Due

Analyses shown above.

\$13.00

Make checks payable to: Water Quality Laboratory

Cut along dotted line and return the lower portion with payment

Sample No. 72-701

Amount Enclosed \$

Signed

EMPIRE

IRRIGATION & DRILLING COMPANY

Highway 14 East

P. O. Box 1252

Huron, South Dakota 57350

Ph. 352-4597

DRILLING REPORT

Location of Well: _____ 1/4, _____ 1/4, _____ Section _____ Township _____ Range _____

Well to be drilled for: Donald Grant & Robert J. Goss (Name) Road & Rapids (Address)
Coolington Co. S. Dak. (County) Dakota (State)

Date well drilling started 10-24-73 finished 10-24-73

Purpose of well _____
 (domestic, irrigation, industrial, other)

Depth _____ ft. Casing Diameter _____ inches
 Slot Size _____ Screen Size _____
 Screen Depth: From _____ ft. to _____ ft.
 Remarks: _____
 1 Mile

REPORT OF FINAL PUMPING TEST

Write Additional Times and Readings on Back of Page

Date _____		Water Level		Discharge
Elapsed Time From Start of Pumping		ft.	in.	(Static)
0 hr.	0 min.			
hr.	min.	ft.	in.	GPM
hr.	min.	ft.	in.	GPM
hr.	min.	ft.	in.	GPM
hr.	min.	ft.	in.	RECOVERY

#5 Formation: Clay, Silt, Sand, Gravel, Color, Hard or Soft, etc.	Depth (ft.)	
	From	To
top soil	0	5
sand & gravel	5	22
gray till	22	25
25 ft. of 5" plastic		

#1 Formation (Continued)	Depth (ft.)	
	From	To
top soil	0	5
sand & gravel	5	17
gray till	17	20

#7	Depth (ft.)	
	From	To
top soil	0	2
sandy clay	2	8
gravel & s	8	15
gray till	15	20

#8	Depth (ft.)	
	From	To
top soil	0	2
sandy clay	2	6
sand & gravel	6	25
gray till	25	40

EMPIRE

IRRIGATION & DRILLING COMPANY

Highway 14 East

P. O. Box 1252

Huron, South Dakota 57350

Ph. 352-4587

DRILLING REPORT

Location of Well: _____ 1/4 _____ 1/4, Section 27, Township 116 52, Range 116
 Well to be drilled for: Drill Water & Rock Test & Core Rock & Rock
Castington (Name) So. Dak. (Address) So. Dak. (State)
 Date well drilling started 10-26-73 finished 10-26-73

Purpose of well _____
 (domestic, irrigation, industrial, other)

Depth 30 ft. Casing Diameter 3 inches

Slot Size 1/2 Screen Size 3

Screen Depth: From 25 ft. to 30 ft.

Remarks:

#18

NORTH

1 Mile

REPORT OF FINAL PUMPING TEST

Write Additional Times and Readings on Back of Page

Date _____

Elapsed Time From Start of Pumping		Water Level		Discharge
hr.	min.	ft.	in.	(Static)
hr.	min.	ft.	in.	GPM
hr.	min.	ft.	in.	GPM
hr.	min.	ft.	in.	GPM
hr.	min.	ft.	in.	RECOVERY

#17 Formation: Clay, Silt, Sand, Gravel, Color, Hard or Soft, etc.

Depth (ft.)

From To

<u>Top soil</u>	<u>0</u>	<u>3</u>
<u>Sand & gravel</u>	<u>3</u>	<u>17</u>
<u>gray till</u>	<u>17</u>	<u>20</u>

#18 Formation (Continued)

Depth (ft.)

From To

<u>sandy clay</u>	<u>0</u>	<u>6</u>
<u>sand & gravel</u>	<u>6</u>	<u>30</u>
<u>gray till</u>	<u>30</u>	<u>40</u>

#19

<u>sandy clay</u>	<u>0</u>	<u>5</u>
<u>sand & gravel</u>	<u>5</u>	<u>15</u>
<u>gray till</u>	<u>15</u>	<u>20</u>

#20

<u>sandy clay</u>	<u>0</u>	<u>4</u>
<u>sand & gravel</u>	<u>4</u>	<u>27</u>
<u>yellow till</u>	<u>27</u>	<u>35</u>

350 ft. water #18

10-28-52-116

IRRIGATION & DRILLING COMPANY

Ph. 352-4537

[illegible]

IRRIGATION & DRILLING COMPANY

Highway 14 East

P. O. Box 1252

Huron, South Dakota 57350

Ph. 352-4597

DRILLING REPORT

Location of Well: _____ 1/4, _____ 1/4, Section _____, Township _____, Range _____

Well to be drilled for: 1. 2nd West 40 ft 2. 3rd West 10 ft

(Name) _____ (Address) _____
(County) _____ (State) _____

Date well drilling started 10-21-73 finished 10-31-73

Purpose of well _____
(domestic, irrigation, industrial, other)

Depth _____ ft. Casing Diameter _____ inches _____ NORTH

Slot Size _____ Screen Size _____

Screen Depth: From _____ ft. to _____ ft.

Remarks: _____

obs. 12.00 - 5.00 1 Mile

REPORT OF FINAL PUMPING TEST
Write Additional Times and Readings on Back of Page

Date _____

Elapsed Time From Start of Pumping	Water Level	Discharge
---------------------------------------	-------------	-----------

O hr.	O min.	ft.	in.	(Static)
-------	--------	-----	-----	----------

hr.	min.	ft.	in.	GPM
-----	------	-----	-----	-----

hr.	min.	ft.	in.	GPM
-----	------	-----	-----	-----

hr.	min.	ft.	in.	GPM
-----	------	-----	-----	-----

hr.	min.	ft.	in.	RECOVERY
-----	------	-----	-----	----------

#	Formation: Clay, Silt, Sand, Gravel, Color, Hard or Soft, etc.	Depth (ft.)		Formation (Continued)	Depth (ft.)	
		From	To		From	To
#7-2						

	From	To		From	To
top soil	0	2			

<u>Wm. L. Daniel</u>	2	50			
----------------------	---	----	--	--	--

9/2/11	30				
--------	----	--	--	--	--

[illegible]

30 ft. black; downy at			
------------------------	--	--	--

for <u>the school</u>					
-----------------------	--	--	--	--	--

--	--	--	--	--	--

[illegible][illegible]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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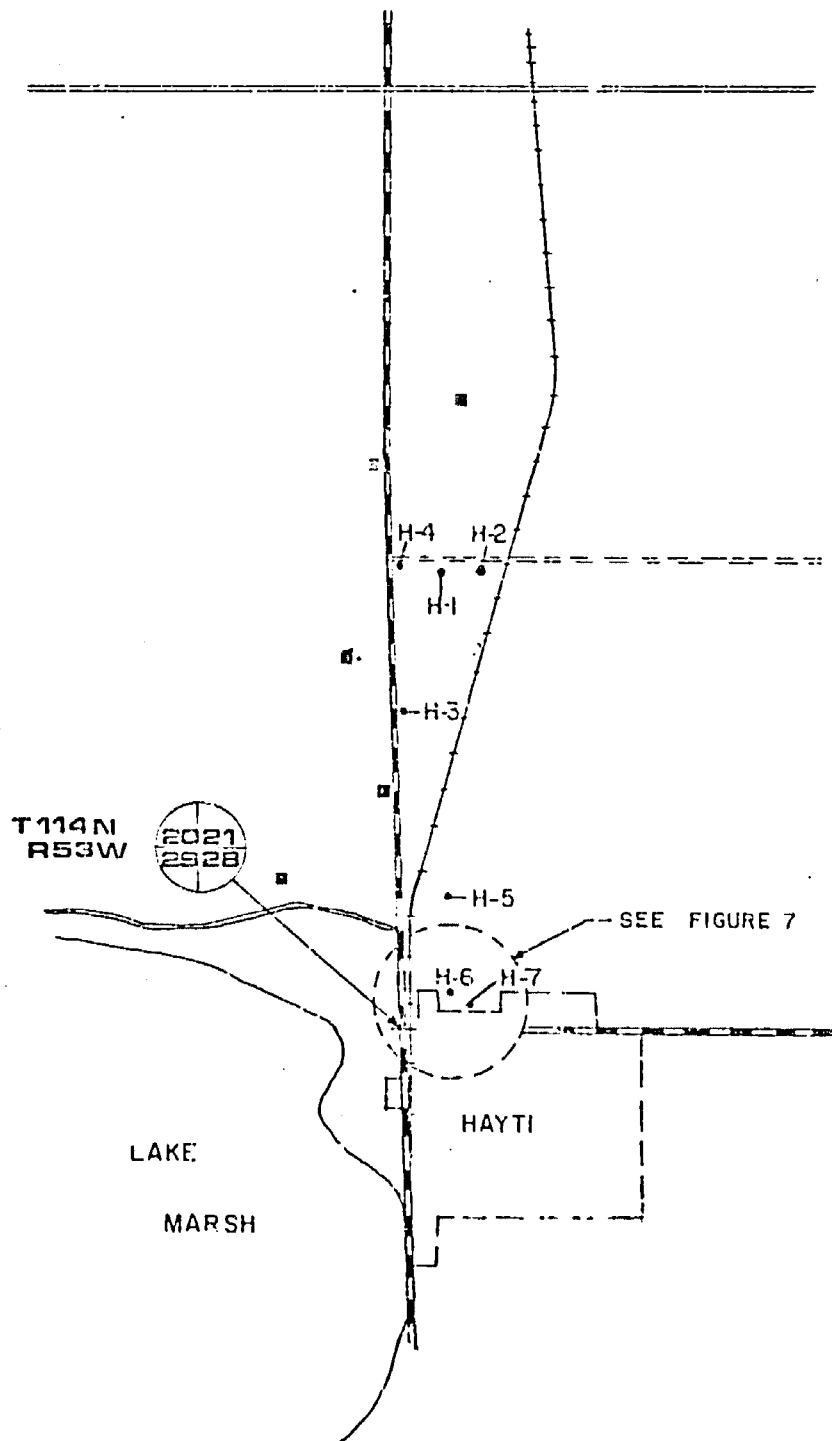
IRRIGATION & DRILLING COMPANY

Ph. 352-4587

[illegible]

SECTION III

FIGURE 6 GENERAL LOCATION OF TEST DRILLING
FOR HAYTI PUMP SITE



DE WILD, GRANT, RECKERT & ASSOCIATES CO. - ENGR'S. & ARCH'S.
ROCK RAPIDS, IOWA SIOUX FALLS, S DAK. SIOUX CITY, IOWA

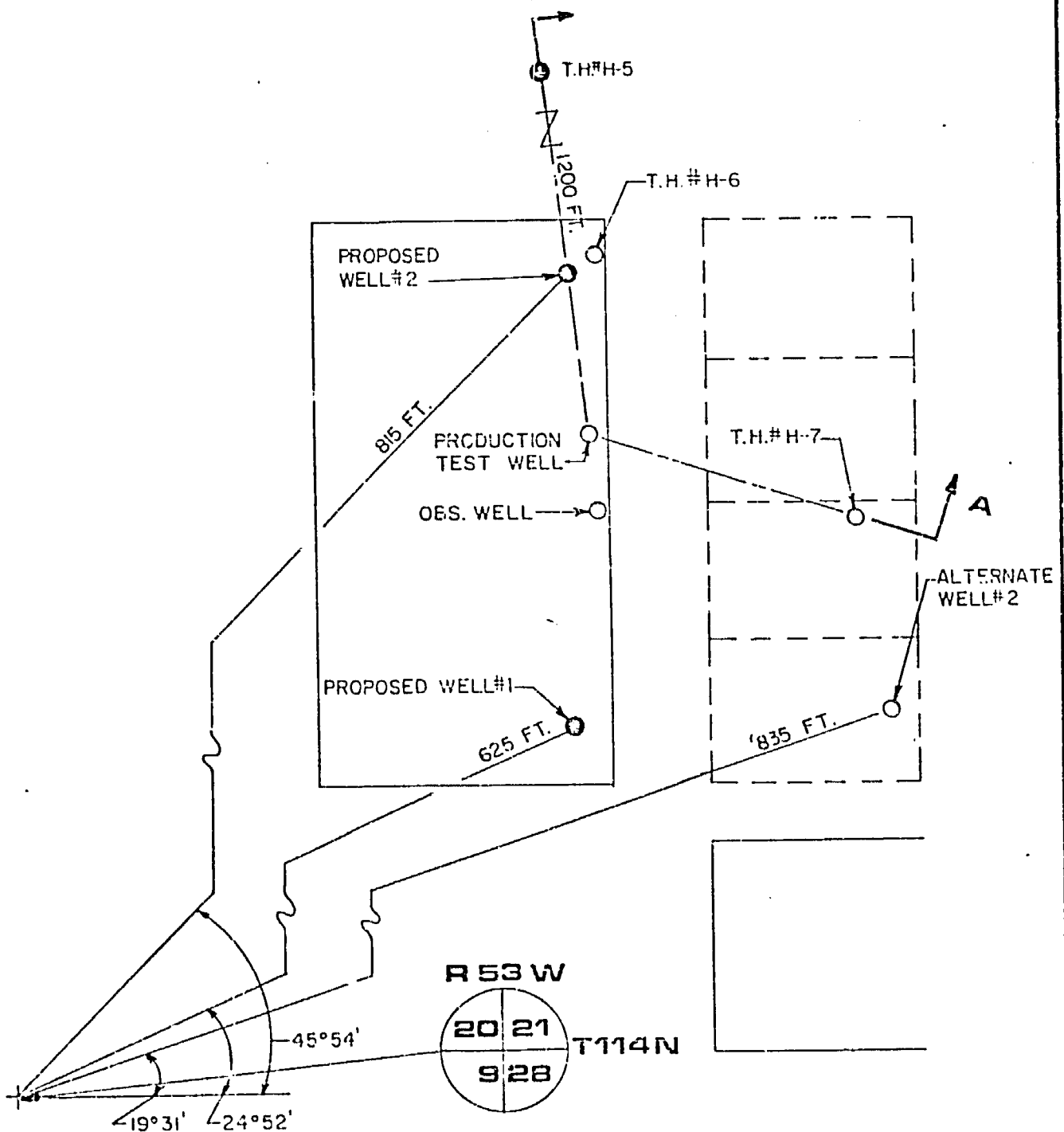
Date 1/9/74
File No. 2246

Table 4. Summary of Water Analysis of Samples Collected from Test Holes at the Hayti Pump Site

Test Hole Number	H-1	H-3	H-4	H-5	H-6	H-7
Date Collected	10-29-73	10-30-73	10-30-73	10-30-73	10-31-73	11-8-73
Nitrate Nitrogen as ppm(N)	2.0	0.02	0.06	0.15		0.1
Hardness, gpg	21.6	17.0	21.6	14.0	12.3	14.3
Iron, (Fe) ppm	0.0	4.25	0.87	0.28	0.15	0.10
Manganese, (Mn) ppm	0.0	2.0	0.4	0.2	0.1	0.5

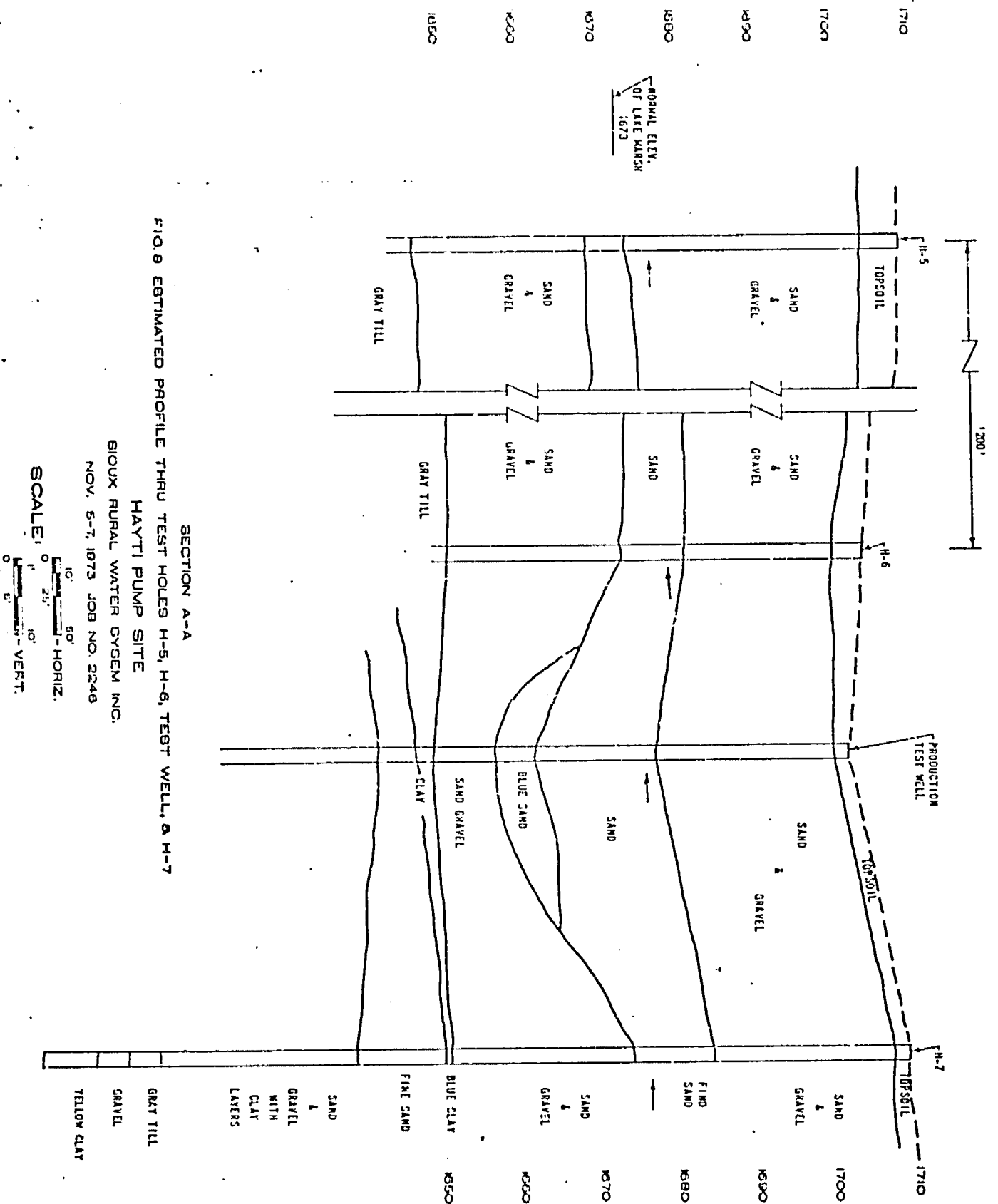
NOTE: Analysis were made with a field test kit and should be verified by laboratory analysis for further use.

FIGURE 7 PLAN LOCATION OF TEST HOLE AND PROPOSED WALLS AT THE HAYTI PUMP SITE



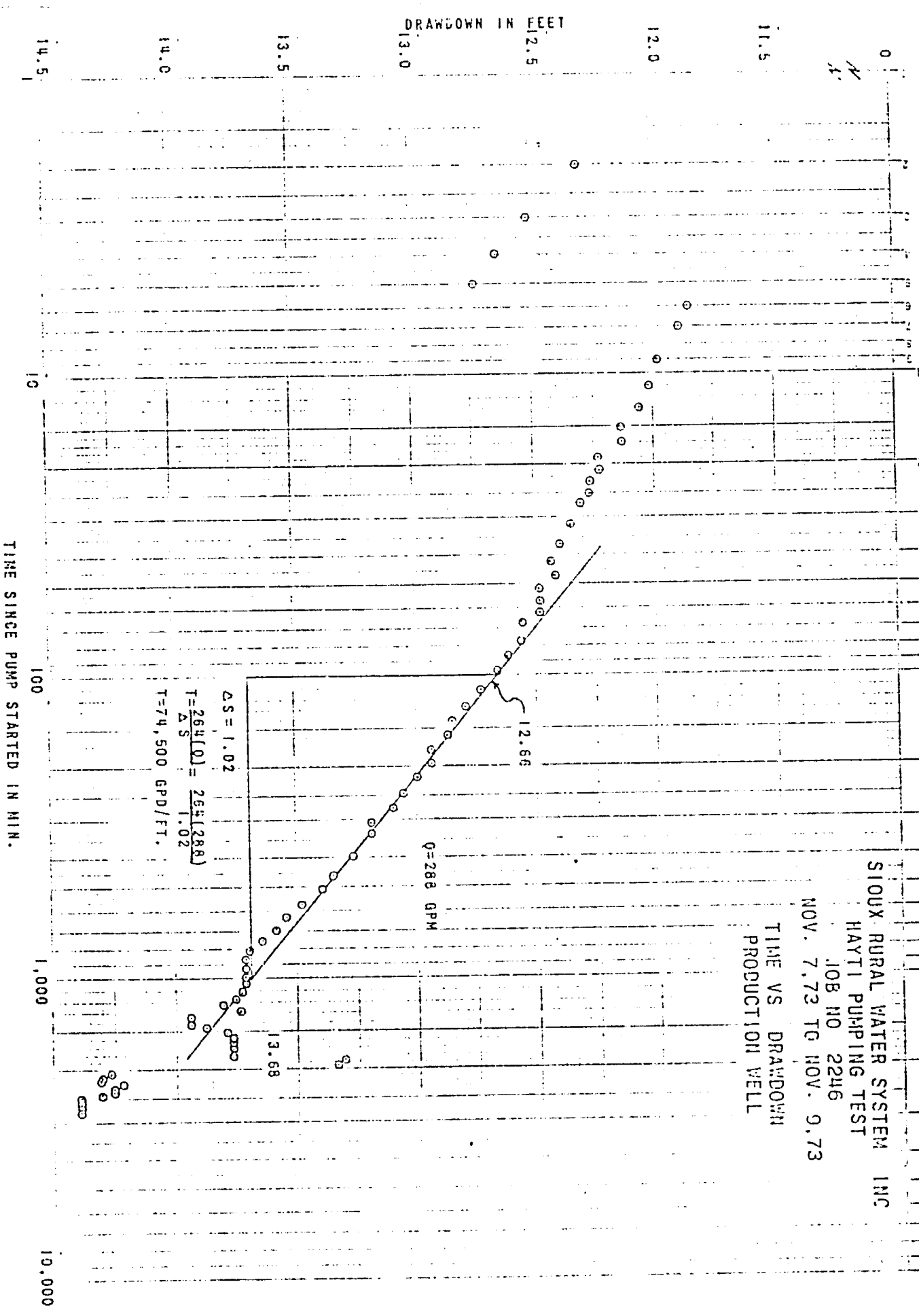
DE WILD, GRANT, RECKERT & ASSOCIATES CO. - ENGR'S. & ARCH'S.
 ROCK RAPIDS, IOWA SIOUX FALLS, S. DAK. SIOUX CITY, IOWA

Date 1/9/74
 File No. 2246



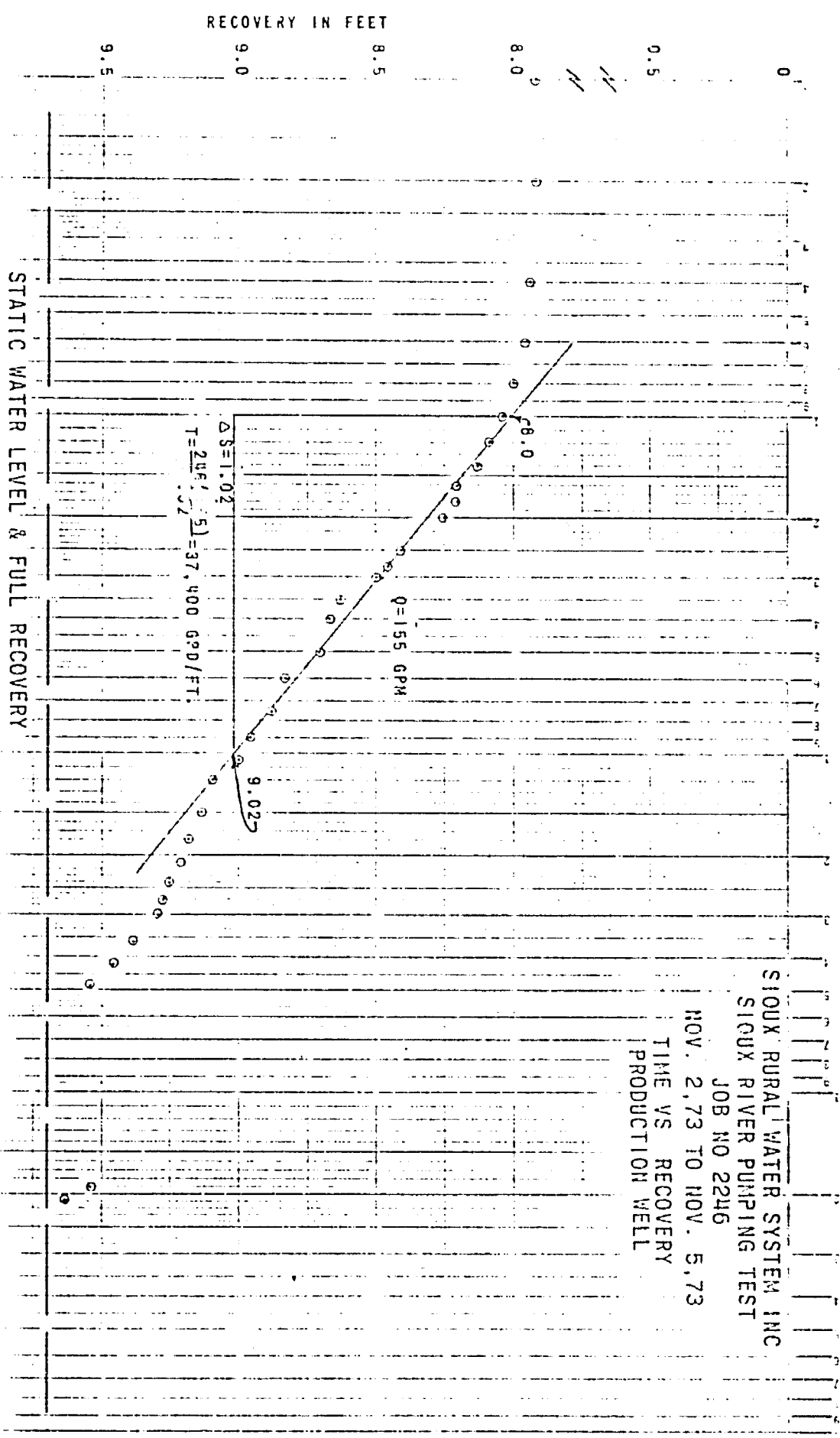
H. L. ...
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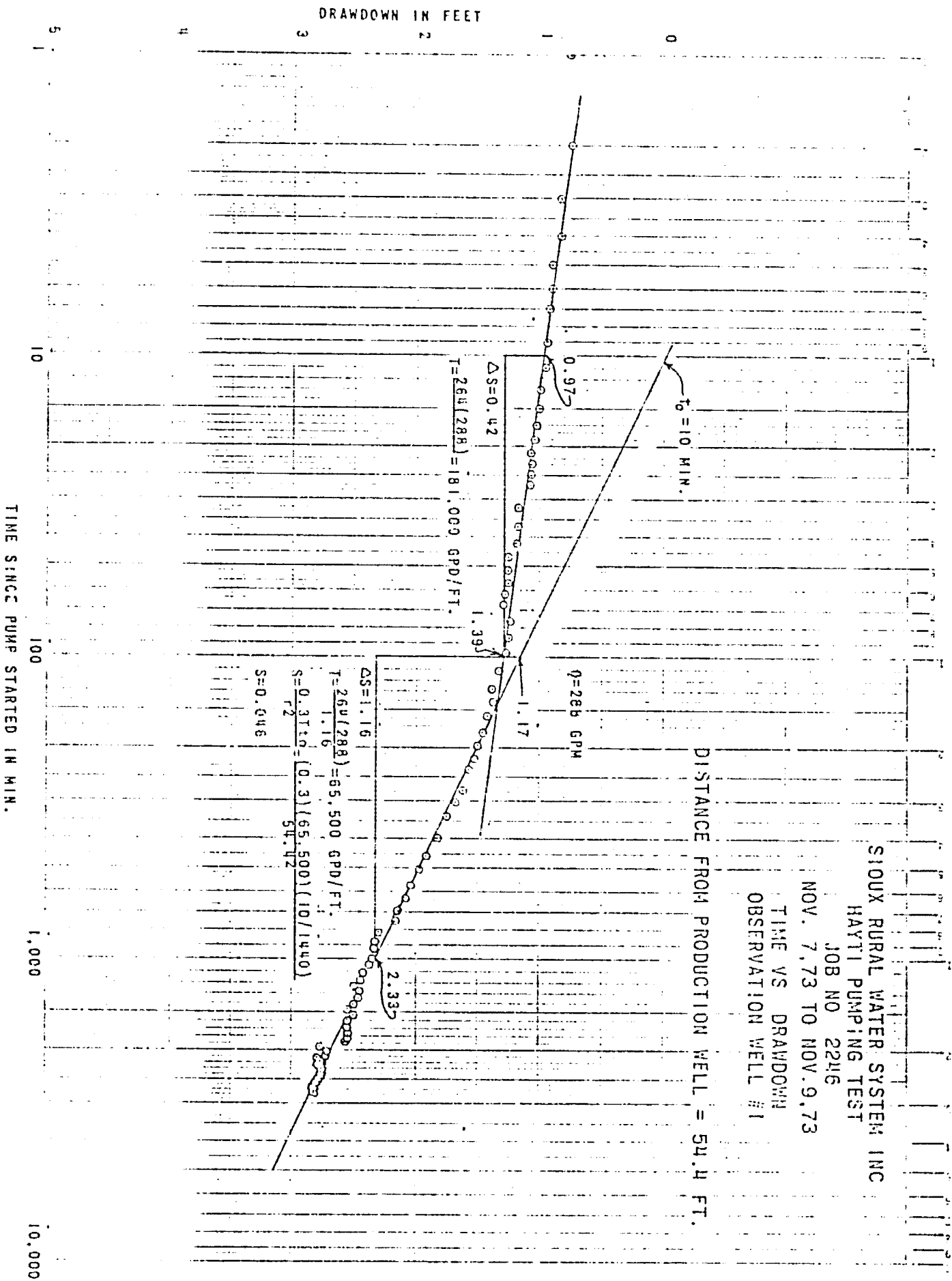
SIOUX RURAL WATER SYSTEM INC
 HAYTI PUMPING TEST
 JOB NO 2246
 NOV. 7, 73 TO NOV. 9, 73
 TIME VS DRAWDOWN
 PRODUCTION WELL



SI-MC-1000-1
 11/15/73
 MODEL 1000-100

SIoux RURAL WATER SYSTEM INC
 SIoux RIVER PUMPING TEST
 JOB NO 2246
 NOV. 2, 73 TO NOV. 5, 73
 TIME VS RECOVERY
 PRODUCTION WELL





RECOVERY IN FEET

TIME SINCE PUMP STOPPED IN MIN.

STATIC WATER LEVEL & FULL RECOVERY

DISTANCE FROM PRODUCTION WELL = 54.4 FT.

SIGUX RURAL WATER SYSTEM INC
HAYTI PUMPING TEST
JOB NO 2246
NOV. 7, 73 TO NOV. 9, 73
TIME VS. RECOVERY
OBSERVATION WELL #1

Q=288 GPM

0.76

1.15

$$\Delta S = 0.40$$
$$T = \frac{264(288)}{0.4} = 190,000 \text{ GPD/FT.}$$

10

100

1,000

SIOUX RURAL WATER SYSTEM INC

HAYTI PUMPING TEST

JOB NO 2246

NOV. 7, 73 TO NOV. 9, 73

TIME VS DRAWDOWN

OBSERVATION WELL H-6

DISTANCE FROM PRODUCTION WELL = 129.3 FT.

DRAWDOWN IN FEET

1.0
0.5
0

1.5
2.0

2.5 10

100

1,000

10,000

TIME SINCE PUMP STARTED IN MIN.

$t_0 = 48$ MIN.

$C = 0.20$

$Q = 288$ GPM

$\Delta S = 0.63$

$T = \frac{264(288)}{0.03} = 120,700$ GPD/FT.

$S = \frac{0.31}{r^2} = \frac{(0.3)(120,700)(48/1440)}{129.3^2}$
 $= 0.072$

0.83

SYNTHETICALLY GENERATED
 RECOVERY CURVE
 PROJECT NO. 100-1000

SIoux RURAL WATER SYSTEM INC
 HAYTI PUMPING TEST
 JOB NO 2246
 NOV. 7.73 TO NOV. 9.73
 TIME VS RECOVERY
 OBSERVATION WELL H-6

RECOVERY IN FEET

STATIC WATER LEVEL & FULL RECOVERY

DISTANCE FROM PRODUCTION WELL = 129.3 FT.

$Q = 228 \text{ GPM}$
 $\Delta S = 0.17$
 $T = \frac{264(268)}{0.17} = 447,200 \text{ GPD/FT.}$

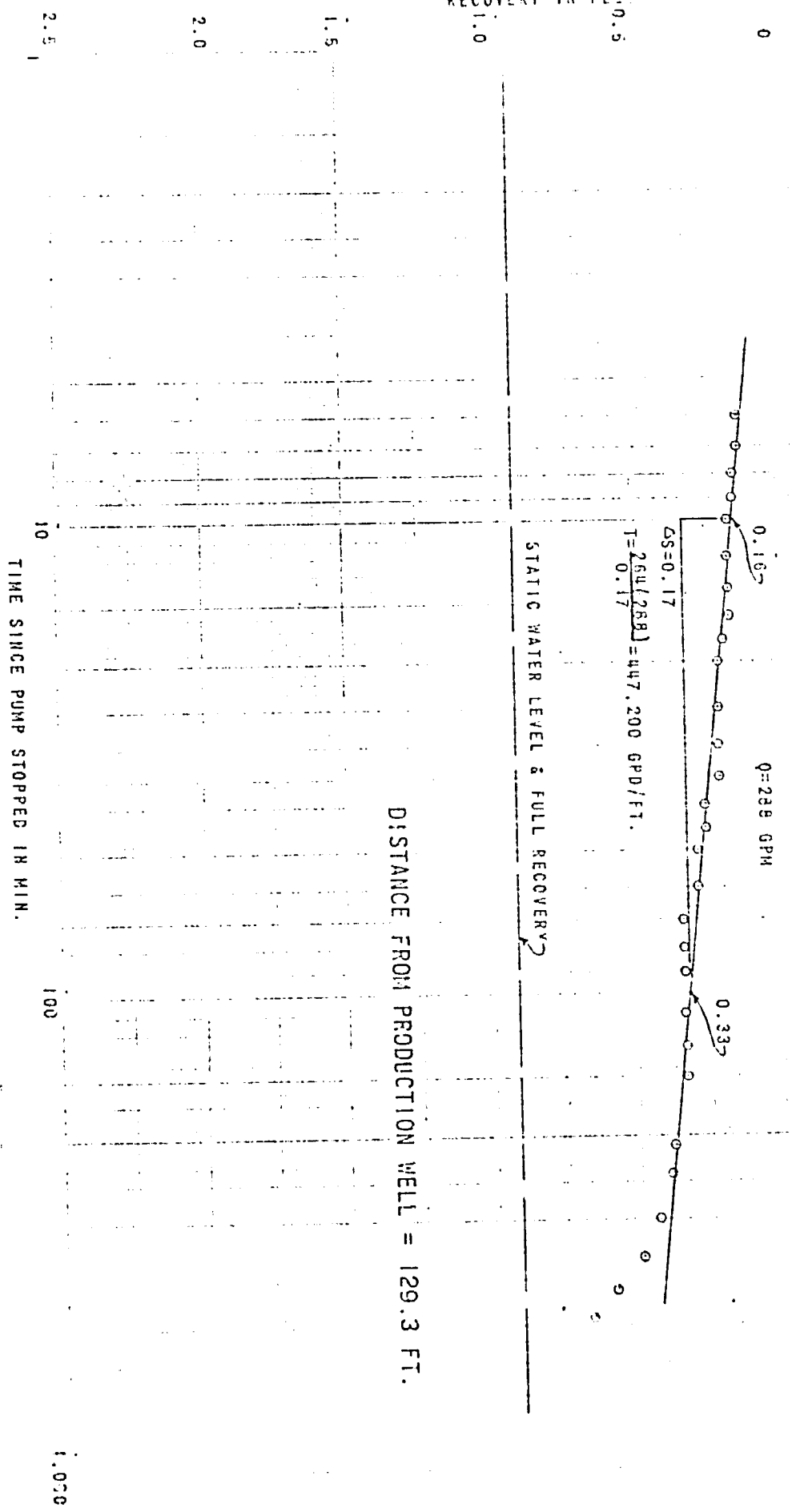


Table 5. Summary of Water Analysis on Samples Collected
During Test Pumping of the Hayti Pump Site

<u>Sample No.</u>	Obs. Well	HW-1	HW-2	HW-3	HW-4	HW-5	HW-6	HW-7
Hours after pumping started		0	12	20	30	36	44	46
Nitrate Nitrogen as ppm (N)	0.1	0.4	0.6	0.5	0.6	0.7	0.9	0.9
Hardness, gpg	13.4	12.6	12.9	12.9	12.9	12.6	12.9	12.9
Iron, (Fe) ppm	0.02	0.19	0.20	0.22	0.16	0.19	0.24	0.22
Manganese, (Mn) ppm	0.3	0.45	0.3	0.1	0.25	0.21	0.20	0.21

NOTE: Analysis were made with a field test kit and should be verified by laboratory analysis
for further use.

SOUTH DAKOTA STATE DEPARTMENT OF HEALTH
Division of Sanitary Engineering
Pierre, South Dakota

E-2.19R/4M/10-65

CHEMICAL WATER ANALYSIS REPORT

City or Town Hayti, South Dakota Date Received..... 11/21/73
Sample Collector's Name..... John Madden Lab. Number..... 731792
Date Collected..... 11/19/73 Date Reported..... 12/5/73
Results Reported To: John Madden
DeWild, Grant, Reckert & Associates
315 First Avenue
Rock Rapids, Iowa 51246
Copies To:

Well site north of Hayti
FIELD DATA

Name of Public Water Supply..... Proposed supply for Sioux Rural Water System.....
Well Source Sampled: Name Test Well Depth..... 50'..... Diameter..... Date Built.....
Other Source Sampled: Name Date Built.....
Legal Description of Source Site.....
Raw or Treated Sample Raw..... Treatment Processes
Additional Information, Remarks
Source (pumped 48 hours) (flows) at gallons per minute
Field Tests: Temperature °C..... Iron..... pH.....
Turbidity Alkalinity, P..... M..... Hardness.....

LABORATORY ANALYSIS RESULTS

(Results in parts per million unless otherwise stated)

Specific Conductance at 22.5 °C..... 360 micromhos per centimeter
Total Solids Dissolved Solids 267 Iron as Fe..... 0.04
Alkalinity as CaCO₃ P..... 0 T or M 148.0 pH..... 8.00
Potassium as K 3.80 Nitrate as N 1.25
Sodium as Na 2.40 Fluoride as F 0.12
Calcium as Ca 54.20 Chloride as Cl 2.00
Magnesium as Mg 19.00 Sulfate as SO₄ 48.35
Manganese as Mn..... 0.35 Bicarbonate as HCO₃ 180.00
Calculated Hardness as CaCO₃ 215 ppm 12.6 apg

Analyst Reported by *[Signature]*

REPORT OF ANALYSIS
 Water Quality Laboratory
 Water Resources Research Institute
 South Dakota State University
 Brookings, South Dakota 57006

Submitted by: CORN BLANCH Date Rec'd: November 15, 1973
 Address: Box 211, Grant, S.D. 57030 Sample No. 73-700
Box 111, Grant, S.D. 57030 Identification 73-700
51146 S.D. Sec. 21, T. 114N, R. 63E

WATER ANALYSIS

Calcium (Ca)	90	ppm*	4.52	me/l**
Magnesium (Mg)	0.5	ppm	0.04	me/l
Sodium (Na)	4	ppm	0.17	me/l
Potassium (K)	6	ppm	0.14	me/l
Sulfate (SO ₄)	33	ppm	0.30	me/l
Nitrate (as N)	2.70	ppm	0.19	me/l
Chloride (Cl)	3	ppm	0.09	me/l
Bicarbonate (HCO ₃)	244	ppm	4.00	me/l
Carbonate (CO ₃)		ppm		me/l
Iron (Fe)	0.06	ppm		me/l
Fluoride (F)	0.00	ppm		me/l
Hardness (EDTA as CaCO ₃)	228	ppm	13	g.p.g.***
Alkalinity (Methyl Orange)	200	ppm (as CaCO ₃)		
Alkalinity (Phenolphthalein)	0	ppm (as CaCO ₃)		
Electrical Conductivity	407	micromhos per cm at 25° C.		
Sodium Adsorption Ratio	0.11			
Sodium	3.49	% of cations		
Residual sodium carbonate	0.00	me/l		
pH	7.46			
Others: Manganese (Mn)	0.15	ppm		

*ppm=parts per million

**me/l=milliequivalents per liter

***g.p.g.=grains per gallon

COMMENTS: Total solids 276 ppm
 Total cations 4.37 me/l
 Total anions 5.08 me/l

By: Shirley Nitten

Service Performed

Amount Due

Determinations shown above.

\$13.00

Make checks payable to: Water Quality Laboratory

Cut along dotted line and return the lower portion with payment

Sample No. 73-700

Amount Enclosed \$

Signed

EMPIRE

IRRIGATION & DRILLING COMPANY

Highway 14 East

P. O. Box 1252

Huron, South Dakota 57350

Ph. 352-4587

DRILLING REPORT

Location of Well: _____ 1/4, _____ 1/4, Section: 21, Township 115, Range 53

Well to be drilled for: D. Miller - 10 ft (Name) Box 10, D. Miller (Address)

Huron (County) S. Dak. (State)

Date well drilling started 10-28-73 finished 10-28-73

Purpose of well _____ (domestic, irrigation, industrial, other)

Depth _____ ft. Casing Diameter _____ inches

Slot Size _____ Screen Size I

Screen Depth: From _____ ft. to _____ ft.

Remarks: _____

NORTH

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20

REPORT OF FINAL PUMPING TEST

Write Additional Times and Readings on Back of Page

Date 10-28-73

Elapsed Time From Start of Pumping		Water Level	Discharge
0 hr.	0 min.	<u>17</u> ft.	in. (Static)
hr.	min.	ft.	in. GPM
hr.	min.	ft.	in. GPM
hr.	min.	ft.	in. GPM
hr.	min.	ft.	in. RECOVERY

#1 25 ft water sample 1 Mile
Ankeny, IA

H I Formation: Clay, Silt, Sand, Gravel, Color, Hard or Soft, etc.

Depth (ft.)

From To

Top soil	0	2
Shale clay	2	6
Loosely gravel	6	34
Gravel fill	34	50
Gravel fill	50	60

H II Formation (Continued)

Depth (ft.)

From To

Top soil	0	2
Loosely gravel	2	8
Loosely gravel	8	26
Gravel fill	26	30

IRRIGATION & DRILLING COMPANY

Ph. 352-4567

#	Formation: Clay, Silt, Sand, Gravel, Color, Hard or Soft, etc.	Depth (ft.)		#	Formation (Continued)	Depth (ft.)	
		From	To			From	To
H 3				H 4			
	top soil	0	1		top soil	0	1
	sand & gravel	1	36		sand & gravel	1	57
	clay	31	38		clay	57	60
	sand & clay gravel	28	59				
	Clay	59	60		57 ft 3" casing for water sample		
	59 ft 3" casing for water sample						
# H 5				H 6			
	top soil	0	5		top soil	0	1
	sand & gravel	5	35		sand & gravel	1	23
	sand	35	40		sand	23	31
	sand & gravel	10	62		sand & gravel	31	53
	gray till	1.2	1.5		gray till	53	55
	55 ft 3" casing for water sample				51 ft casing for water sample		

IRRIGATION & DRILLING COMPANY

Ph. 352-4527

IRRIGATION & DRILLING COMPANY

Highway 14 East

P. O. Box 1252

Huron, South Dakota 57350

Ph. 352-4537

DRILLING REPORT

Location of Well: _____ 1/4, _____ NW 1/4, Section 21, Township 115, Range 53

Well to be drilled for: Dr. Wild Hunt Robert Rock Rapids, Iowa
(Name) (Address)
Hamden S. Dak.
(County) (State)

Date well drilling started 11-5-73 finished 11-5-73

Purpose of well other (domestic, irrigation, industrial, other)

Depth 50 ft. Casing Diameter 3 inches

Slot Size 24 Screen Size 3

Screen Depth: From 40 ft. to 50 ft.

Remarks:

NORTH

REPORT OF FINAL PUMPING TEST
Write Additional Times and Readings on Back of Page

Date.

Elapsed Time From
Start of Pumping

Water Level

Discharge

O b r.

0 min.

f..

44

(Static)

hr

min.

ft.

in.

GPM

hr

min.

ft.

In.

GPM

hr

run.

n.

in

GPM

RECOVERY

Formation: Clay, Silt, Sand,
Gravel, Color, Hard or Soft, etc.

Depth (ft.)

From	To
------	----

Formation (Continued)

Depth (ft.)

From	To
------	----

Top soil	0	2
Sand + gravel	2	15
sand	15	10
Gravel	10	55

IRRIGATION & DRILLING COMPANY

Ph. 352-4567

top soil	0	2
sand & gravel	2	25
base soil	25	40
blue sand	40	15
sand & gravel	45	53
clay	53	55

STATE OF SOUTH DAKOTA

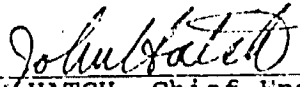
WATER LICENSE NO. 2033-3

(1) Sioux Rural Water System, Inc. of RR 4, Box 162, Watertown, SD 57201 made Application No. 2033-3, December 12, 1973 for a water permit to appropriate 0.75 cubic feet of water per second from groundwater (two wells), Hamlin County, South Dakota for rural water system purposes. Permit No. 2033-3 with a priority date of December 12, 1973 was approved January 16, 1974 and issued to applicant(s) for diversion of water with construction of the described water supply system to be completed on or before January 16, 1977 and for the application to beneficial use of said water on or before January 16, 1977.

(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 0.66 cubic feet of water per second for beneficial use. The location of the diversion points are: #1 - 595'E and 395'N of the SW corner; #2 - 790'E and 430'N of the SW corner both in Section 21, T114N, R53W (both in SW 1/4 SW 1/4).

(3) The applicant has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use. The two wells known as the Hayti Pump Site are currently used as standby wells.

(4) Pursuant to Section 45-5-30.1 Sioux Rural Water System, Inc. of RR 4, Box 162, Watertown, SD 57201 the holder(s) and/or owner(s) of Water Permit No. 2033-3 is issued a license to appropriate water, the right to use 0.66 cubic feet of water per second from groundwater (two wells) with a priority date of December 12, 1973 from the location specified in (2) of this license. The water is used for rural water system purposes. This license is subject to any limitations or qualifications listed in Water Permit No. 2033-3 and subject to South Dakota State Law.

 MAR 24 1992
JOHN HATCH, Chief Engineer
Water Rights Division
Department of Environment and
Natural Resources



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

MAR 24 1992

2033-3

Sioux Rural Water System, Inc.
RR 4, Box 162
Watertown, SD 57201

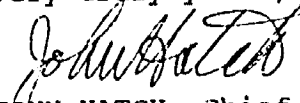
Dear Sirs:

Enclosed is Water License No. 2033-3. This is the final water right document completing your process of obtaining a Water Right. Enclosed is Receipt No. 412990 in the amount of \$50.00 which you paid for the inspection and issuance of the Water License.

For your information SDCL 46-6-27 requires that if the owner of an existing well, such as the well authorized by Water Right No. 2033-3, constructs a replacement well and does not plan to use the old well, the old well is considered abandoned and must be plugged. Also, any well that is being used or is not considered abandoned must be valved and controlled, if flowing, or sealed and capped so that no leaking occurs either underground or at the surface.

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

Very truly yours,


JOHN HATCH, Chief Engineer
Water Rights Division
(605) 773-3352

enclosures

Permit No. 2033-3Big Sioux River Water District**Report Of Examination Of Works And/Or Application Of Water To Beneficial Use**

TO: Chief Engineer, Division of Water Rights, DWNR, Foss Bldg., Pierre, SD 57501

I have this day made a thorough examination of the water use system constructed by Sioux Rural Water System, Inc. RR4 Box 112 of Water town, SD 57201 holder of Permit No. 2033-3 bearing the priority of December 12 1973 authorizing the diversion of 1.75 cu. ft. per second of the waters of groundwater for Rural Water System Standby purposes, in Hanklin County.

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

A. Works used to divert the water:

- #1 7 1/2 HP - 3" Layne pump Model No. 8RM-type with a U.S. Electric Motor Model No. 213TP capable of 150gpm
- #2 7 1/2 HP - 8" Vertiline pump Model No. 8RM-type with a U.S. Electric Motor Model No. 213TP capable of 150gpm

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

- #2 6" PVC - 222' to the groundwater storage
- #1 6" PVC - 80' " " " "

C. Works used to apply water to beneficial use:

through the Sioux Rural Water System's distribution system.

The system is in the following condition fairThe point of diversion is located #1 595' E and 395' N of the SW corner.#2 790' E and 430' N of the SW corner in Section 21-T114N-R53WThe works are capable of diverting and conveying to the place of use .666cu. ft. per second of water which is to be used for Rural Water System Standby

Water has been put to beneficial use to the maximum extent as follows:

comprising a total of NA acres of land and the license should be issued for .666 cfsApplicable permit qualifications have been complied with X Yes NoExceptions to compliance are:

Date

8/6/1991

Norma C. Job
(signature)

5. System Type a) sideroll:

- 1) length _____ feet
- 2) diameter of pipe _____
- 3) make, model & number of
sprinklers _____
- 4) spacing of sprinklers _____
- 5) nozzle size _____

c) gun

- 1) make _____
- 2) nozzle size _____
- 3) capacity (GPM) _____
- 4) hose size _____
- 5) hose length _____

e) gated pipe

- 1) length _____
- 2) diameter _____
- 3) spacing of gates _____

f) portable boom

- 1) make _____
- 2) nozzle size _____
- 3) capacity (GPM) _____

b) towline:

- 1) length _____ feet
- 2) make, model & number of
sprinklers _____
- 3) spacing of sprinklers _____
- 4) nozzle size _____

d) center pivot

- 1) make _____
- 2) number of towers _____
- 3) distance between towers _____
- 4) overall length _____
- 5) end gun (Y/N) _____
- 6) high or low pressure _____
- 7) make & size of nozzles _____
- 8) capacity (GPM) _____

g) siphons

- 1) size _____
- 2) number _____

NOTE: For Permits with additional wells or changes in well locations, record the following for each well: pumping capacity, date constructed, well driller and if a well log is available.

Indicate any other permit(s) which are associated with project _____

Yes	No	Check Items
___NA___	___	1. Soil and water permit lands agree with lands being irrigated and lands listed on permit?
___✓___	___	2. Special qualifications to permit being abided by?
___✓___	___	3. All structures, wells and lands on map?
___NA___	___	4. Irrigation Questionnaires checked to determine if permit owner started irrigation by end of construction period?
___✓___	___	5. Is chemigation used?
___NA___	___	6. If yes, does equipment comply with chemigation rules?

REMARKS:

LICENSE FOR PERMIT NUMBER 2033-3

1. Legal location of wells: #1 SW 1/4 SW 1/4 #2 SW 1/4 SW 1/4
Section 21-T 114N-R 53W

dams & structures: _____

2. Well Information: Well Drilling Firm Empire Irrigation
Well logs not available

Completion Report Yes No No. of Wells 2 Depth 40 40

Casing a) diameter 12" 12" Screen a) type

b) length b) length

c) type Steel Steel Static Water Level

Pump a) make Layne Vertiline Motor a) make USE Electric USE Electric ^{Motor}

b) model 8RM-type 8RM-type b) model No. 213TP 213TP

c) size 8" 8" c) horsepower rating 7 1/2 7 1/2

d) capacity 150 150 gpm

e) turbine pump - no. of stages 3

f) operating PSI

#1 SN# V7403597 #2
V7403597

3. Distribution lines or canals

a) size 6" 6"

b) type PVC PVC

c) length 80' 222'

to Gu to the Ground-
Storage Water Storage

4. Dam Information:

a) height to crest m) Outlet tubes:

b) height to primary spillway 1) diameter

c) height to secondary spillway 2) type

d) crest width 3) valved (Y/N)

e) crest length 4) valve type

f) spillway length 5) location on structure

g) spillway width

h) approx. storage n) Category of Dam

i) approx. storage to crest

j) date constructed

k) inspection sheet completed (Y/N)

l) Name of Contractor

South Dakota

GREAT LACES. GREAT PLACES.

DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

December 19, 1991

2033-3

Sioux Rural Water System, Inc.
Rr 4, Box 162
Watertown SD 57201

Dear Sir:

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 No. 2033-3, has been completed. Your final water right document, the Water License, can now be issued.

Statutes require that we charge a \$50.00 fee for the inspection and issuance of the Water License. Upon receipt of the \$50.00 fee from you, we will begin processing your Water License.

South Dakota Water Law 46-5-30.1 requires that a permit holder may not divert water until the \$50.00 license fee has been paid. Please contact us if you have any questions.

Sincerely,

Genny McMath

Genny McMath
Natural Resources Analyst
(605) 773-3352

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

RECEIPT

Division of Water Rights

South Dakota Department of Water and Natural Resources

Pierre, January 2, 1912

RECEIVED OF Sioux Rural Water System, Inc., RR 4, Box 162, Watertown, SD 57201

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

Fee for Application for Permit No. _____ to Appropriate Water, to construct works 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. 2033-3	50	00
Fee for Filing Transfer Form _____		
Fee for Filing Extension Request _____		
Fee for Certified Copy of _____		
Fee for Print Copy of Map _____		
Fee for Certifying _____		
Fee for _____		
(Any Other Work Provided by Law)	Total	50 00

By Del. Hatch
Chief Engineer

Water Rights Division - DVHR

File No. 2032-3

Conversation or File Documentation

NAME OF PERSON OR FILE: Sioux Rural WaterADDRESS: _____ COUNTY HumboldtDATE: 8/22/91 TELEPHONE _____

RE: _____

COMMENTS:

On the inspection of this permit, I was told these two wells were used for ^{standby} ~~base~~ wells. #2 well was ready for use at the time of inspection. #1 well was missing a flow valve at the time. I mentioned to Doug Anderson that the valve would have to be replaced to be considered a standby well.

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

NAME: Norma C. Goh

2033-3

11411-550-36.6000

Preliminary
Report

Section:

Location

T.

R

Well:

Land Owner:

Date: 10-12-83

Elevation: 1685 (T)

E-Log: *No*

Samples:

Drilling Company: SIGS

Project: *Turner-McCook PWS*

Geologist: D. Helly

LONG. 97° 08' 51"
LAT. 44° 38' 14"

Rotary: ✓

Auger:

Driller: *M. Jarnett*

Thickness	Lithologic Description	From - to Feet
0-2	Silt, grayed-black sandy (topsoil)	
2-19	Sand, ^{and gravel} medium to very ^{fine} coarse gravel, mostly subrounded quartz, cobble and some dark crystalline rock fragments	
19-35	Sand and gravel medium sand to medium fine, more or less ^{medium} gravel below 30 feet; mostly ^{sub} angular to subrounded pebbles and black crystalline rock fragments and gravel	
35-40	Clay, medium dark gray, silty sandy, granular, unconsolidated calcareous	
	Total coring & screen 38'	
	5' sand point and 5' bottom slots above.	
	Development and 850	
	M.P. 2.4'	
	W.L. 17.2 10-20-83	
	W.L. 17.1 11-3-83	
Gap	1670	

1158-83 and 1158-83

REDUCTION RATIO

ROLL NUMBER:

DATE RECORDED

1

[illegible]

SAMPLE NC=HSX035

No Recommended Service - Data OK 12/5/83 mrc

Preliminary Report

S C I
 O C C U P A T I O N S
 1960-1970

[illegible][illegible]

$$= \cos^{-1} \left(\frac{1}{\sqrt{2}} \right) = 45^\circ$$

10. 114N-53N-36ABBB 108 25 66 438.84 0 15 402 4.9 1.13 0.05 0.38 0.2 0 0 0 0 0.95377 0 0 0 0 1073 1125 8.38323
CBS N LOC CA NA MG HCO3 CO3 CL SO4 K MN FE F NO3_N AS CU MO B C_COND CR ZN PB HG SE TDS COND CA_ME-
428 BAPI2/2
12 1 114N-53N-36ABBB 108 25 66 438.84 0 15 402 4.9 1.13 0.05 0.38 0.2 0 0 0 0 0.95377 0 0 0 0 1073 1125 8.38323
CBS NA_MEQ MG_MEQ MN_MEQ K_MEQ HCO3_MEQ CO3_MEQ CL_MEQ F_MEQ NO3_MEQ SO4_MEQ CATIONS ANIONS SUM PER_DIFF

12 1.05743 5.42763 0.00179083 0.0411358 0.12532 7.19174 0 0.423095 0.02 0.0142755 9.01899 15.0665 17.2681 95.123 0.3087
CBS N LOC CA NA MG HCO3 CO3 CL SO4 K MN FE F NO3_N AS CU MO B C_COND CR ZN PB HG SE TDS COND CA_ME-
13 1 114N-53N-36ABBB 108 25 66 438.84 0 15 402 4.9 1.13 0.05 0.38 0.2 0 0 0 0 0.95377 0 0 0 0 1073 1125 8.38323
CBS NA_MEQ MG_MEQ MN_MEQ K_MEQ HCO3_MEQ CO3_MEQ CL_MEQ F_MEQ NO3_MEQ SO4_MEQ CATIONS ANIONS SUM PER_DIFF

13 1.05743 5.42763 0.00179083 0.0411358 0.12532 7.19174 0 0.423095 0.02 0.0142755 9.01899 15.0665 17.2681 95.123 0.3087
CBS N LOC CA NA MG HCO3 CO3 CL SO4 K MN FE F NO3_N AS CU MO B C_COND CR ZN PB HG SE TDS COND CA_ME-
14 1 114N-53N-36ABBB 108 25 66 438.84 0 15 402 4.9 1.13 0.05 0.38 0.2 0 0 0 0 0.95377 0 0 0 0 1073 1125 8.38323
CBS NA_MEQ MG_MEQ MN_MEQ K_MEQ HCO3_MEQ CO3_MEQ CL_MEQ F_MEQ NO3_MEQ SO4_MEQ CATIONS ANIONS SUM PER_DIFF

14 1.05743 5.42763 0.00179083 0.0411358 0.12532 7.19174 0 0.423095 0.02 0.0142755 9.01899 15.0665 17.2681 95.123 0.3087
CBS N LOC CA NA MG HCO3 CO3 CL SO4 K MN FE F NO3_N AS CU MO B C_COND CR ZN PB HG SE TDS COND CA_ME-
15 1 114N-53N-36ABBB 108 25 66 438.84 0 15 402 4.9 1.13 0.05 0.38 0.2 0 0 0 0 0.95377 0 0 0 0 1073 1125 8.38323
CBS NA_MEQ MG_MEQ MN_MEQ K_MEQ HCO3_MEQ CO3_MEQ CL_MEQ F_MEQ NO3_MEQ SO4_MEQ CATIONS ANIONS SUM PER_DIFF

15 1.05743 5.42763 0.00179083 0.0411358 0.12532 7.19174 0 0.423095 0.02 0.0142755 9.01899 15.0665 17.2681 95.123 0.3087
CBS N LOC CA NA MG HCO3 CO3 CL SO4 K MN FE F NO3_N AS CU MO B C_COND CR ZN PB HG SE TDS COND CA_ME-
16 1 114N-53N-36ABBB 108 25 66 438.84 0 15 402 4.9 1.13 0.05 0.38 0.2 0 0 0 0 0.95377 0 0 0 0 1073 1125 8.38323
CBS NA_MEQ MG_MEQ MN_MEQ K_MEQ HCO3_MEQ CO3_MEQ CL_MEQ F_MEQ NO3_MEQ SO4_MEQ CATIONS ANIONS SUM PER_DIFF

Preliminary Report

No Review; Date OK 12/15/83 mee.

SOUTH DAKOTA GEOLOGICAL SURVEY

Location

Preliminary
Report

Location (T) 50-1-30-10

Section:

T.

Test Hole: 83-136

Well:

Land Owner:

County: Huron

Date: 8-3-83

Elevation: 1720 (T) 141° 11' 03" 51"
141° 41' 03" 58"

E-log: 120

Samples: 110-120
120-130

Drilling Company: SDGS

Project: Hayti-Silver Pass

Geologist: D. Holly

Rotary: C-60

Auger:

Driller: S. Mitchell

Thickness	Lithologic Description	From - to Feet
0-2	Silt, grayish-black sandy (topsoil)	
2-22	Clay, dusky yellow to light olive brown, silty sandy, generally oxidized, calcareous (full)	
22-37	Clay, medium-dark green, silty sandy, generally unoxidized, calcareous (full)	
37-103	Clay, dusky yellow to light olive brown, silty sandy, generally oxidized, calcareous (full)	
103-130	Sand and gravel, medium sand to fine gravel with (some medium gravel, mostly sub-rounded quartz carbonate, and some angular black and light chert-like rock fragments. may contain a few thin clay layers.	
130-146	Clay, light olive brown to medium dark gray, silty sandy, generally, partially oxidized, calcareous (full)	
	T. D. 146	
	Total casing & screen 132 feet	
	5' sandpoint & 15' bar screen	
	Slate above sandpoint	
	Gravel packed	
	Elev. completed 1,000	8-4-83
	M.P. 2.4'	
	W.C. 34.05 8-4-83	
	GWA 1683	

103-130 sand

130-146 clay

1158-83-24

SOUTH DAKOTA GEOLOGICAL SURVEY

Location

114N 53W Sec 16 T. 114N R. 53W Sec 16
Preliminary Report

Location 14N-53-1-26 old Section:

T.

Test Hole: CO-83-131 Well:

Land Owner:

County: Hamlin

Date: 8-4-83

Elevation: 1695(7) 1695.97° 08' 51"

E-Log: No

Samples: 65-75
105-115

Drilling Company: SDGS

Project: Tyti-Sour Rws

Geologist: D. Holly

Rotary: Combs

Auger:

Driller: S. Mitchell

Thickness	Lithologic Description	From - to Feet
0-2	Silt, grayish-black, clayey (top soil)	
2-18	Clay, dusky-yellow to light olive brown, silty sand, gravelly, oxidized calcareous (fill)	
18-55	Clay, medium dark gray, silty sand, gravelly, unoxidized, calcareous (fill)	
55-77	Sand, medium, medium coarse, gravelly, mostly subangular to subrounded, dark gray, and rounded, crystalline rock fragments	
77-92	Clay, dusky yellow to light olive brown, silty sand, gravelly, oxidized calcareous (fill)	
92-118	Clay, dusky yellow to light olive gray, silty	
118-136	Sandy, gravelly, partially oxidized, calcareous (fill)	
	T.D. 136'	
	Total casing & screen 125 feet	
55-62	Sand, fine, silty	
62-77	Sand, fine, silty	
77-92	Sand, fine, silty	
92-118	S&G	
	M.P. 2.60	
	W.C. 19.60 8-5-83	
	Elect Cond 600	

GWA 1678

115X-83-28

Location:

Section:

T.

R.

Well:

Land Owner:

Date: 7-27-83

Elevation: 1685 (7)

Samples: 5-13
15-21

Drilling Company: SDO S

Geologist: *D. Holz*

Augur:

Driller: S. Mitchell

[illegible]

9:34 105304V, SEPTEMBER 13, 1963

SAS

0.53010 0.001790 0.00182017 0.0409207 0.59472 0 0.169238 0.0157095 1.07000 2.7691 0.04005 8.0.992 493.003 0.12418

SAMPLEID=HSA023

Hardness (Co, Mg) = 271

0.53010 0.001790 0.00182017 0.0409207 0.59472 0 0.169238 0.0157095 1.07000 2.7691 0.04005 8.0.992 493.003 0.12418

0.53010 0.001790 0.00182017 0.0409207 0.59472 0 0.169238 0.0157095 1.07000 2.7691 0.04005 8.0.992 493.003 0.12418

0.53010 0.001790 0.00182017 0.0409207 0.59472 0 0.169238 0.0157095 1.07000 2.7691 0.04005 8.0.992 493.003 0.12418

0.53010 0.001790 0.00182017 0.0409207 0.59472 0 0.169238 0.0157095 1.07000 2.7691 0.04005 8.0.992 493.003 0.12418

SAMPLEID=HSA024

Hardness (Co, Mg) = 509

0.53010 0.001790 0.00182017 0.0409207 0.59472 0 0.169238 0.0157095 1.07000 2.7691 0.04005 8.0.992 493.003 0.12418

0.53010 0.001790 0.00182017 0.0409207 0.59472 0 0.169238 0.0157095 1.07000 2.7691 0.04005 8.0.992 493.003 0.12418

11/10 view - Shored

Section

Location

I.

R.

Well:

Land Owner:

Lat: 99 43 02

Date: 7-20-83

Elevation: 1680 (7) Long: 97 03 26

Samples: $\frac{1}{2}$ ✓

Drilling Company: SDGS

Geologist: D. Holly

Auger:

Driller: S. M. & L. B.

2
36
2
36
36

W.L. 4.8 11-4-83
Conrad 400 11-4-83

1 3.04276 0.00279083 0.00254823 0.176471 4.79449 0 0.592334 0.0684211 0.278373 2.47762 8.83911 8.21124 462.437 3.68258

Hardness (Ca/Mg) = 375

2 1.15N-52N-35DBAB 82 13 32 243.8 0 9 121 7.1 0.46 0.07 0.13 0 0 0 0.678460 0 0 0 0 450.678 4.09182 0.565403

Hardness (Ca/Mg) = 336

2 2.03158 0.00250710 0.0107455 0.181586 3.99541 0 0.253857 0.00684211 0 2.51920 7.4897 8.77537 384.636 5.00753

2 114N-52N-03BAAA 87 17 20 255.99 0 6 101 4.04 0.07 0.05 0.27 2.4 0 0 0 0.703428 0 0 0 0 472.071 4.34132 0.739452

2 2.13810 0.00179083 0.00254823 0.103325 4.19518 0 0.169238 0.0142105 0.171306 2.10285 7.32659 8.05279 377.925 4.6199

2 114N-52N-04AAAA 91 21 34 280.37 0 5 95 2.3 0.08 0.31 0.28 4.9 0 0 0 0.69599 0 0 0 0 558 773 4.54092 0.913441

117N 55W 23 Sec 19

SOUTH DAKOTA GEOLOGICAL SURVEY

Location

Location 117N 55W 23 Sec 19

Section:

T.

R.

Test Hole CO-83-136

Well:

Land Owner:

County: Hamilton

Date: 8-3-83

Elevation: 1720 (T) 1416.97' 08' 51"

E-Log: No

110-120
120-130

Drilling Company: SDG 5

1416.44' 03' 58"

Project: Hayti-Sioux

Geologist: D. Holly

Rotary: Combu

Auger:

Driller: S. Mitchell

Thickness	Lithologic Description	From - to Feet
0-2	Silt, grayish-black sandy (top soil)	
2-22	Clay, dusky yellow to light-olive brown, silty sandy, gravelly, oxidized, calcareous (fill)	
22-37	Clay, medium-dark gray, silty, sandy, gravelly, unoxidized, calcareous (fill)	
37-103	Clay, dusky-yellow to light olive brown, silty sandy, gravelly, oxidized, calcareous (fill)	
103-130	Sand and gravel, medium sand to fine gravel with (some medium gravel, mostly subrounded quartz carbonate, and angular black and light crystalline rock fragments. may contain a few thin clay layers.	
130-146	Clay, light-olive brown to medium dark gray, silty, sandy, gravelly, partially oxidized, calcareous (fill)	
	T.D. 196	
	Total casing & screen 132 feet	
	5' sandpoint & 15' backflow	
	Slots above sandpoint	
	Gravel packed	
	Elect. conductivity 1.00	8-9-83
	M.P. 2.4'	
	W.L. 37.05	8-9-83
	GWA 1683	

103-130 sand
130-146 clay

H5X-83-29

SOUTH DAKOTA GEOLOGICAL SURVEY

Location

Location 190-531-26 added Section:

T.

R.

Test Hole: CO-83-226137 Well:

Land Owner:

County: *Hamlin*

Date: 8-4-83

Elevation: 16.95(7) Lat. 47° 08' 51"
Long. 110° 39' 07"

E.Log: No

Samples: 65-75
105-115

Drilling Company: SDG S

Project: Hayti - Sioux RUS

Geologist: D. Holly

Rotary: Combo

Auger:

Driller: S. Mitchell

Thickness	Lithologic Description	From - to Feet
0-2	Silt, grayish-black, clayey (top soil)	
2-18	Clay, dusky-yellow to light olive brown, silty sandy, granular, oxidized, calcareous (fill)	
18-55	Clay, medium dark gray, silty, sandy, granular, unoxidized, calcareous (fill)	
55-77	Sand, medium coarse, medium coarse, granular, mostly subangular to subangular, dark & light and associated crystalline rock fragments contains clay lenses. From 55 to 62 feet	
77-92	Clay, dusky yellow to light olive brown, silty sandy, granular, oxidized calcareous (fill)	
92-118	Sand, orange, clay, dusky yellow to light olive gray, silty	
118-136	Sandy, granular, partially oxidized, calcareous (fill)	
	T D 136	118'
	Total casing & screen 123 feet	118'
Sand up to 100 ft	5' sand point & 15' bottom	
Sand	slate above sand point	
Sand & clay	Gravel packed.	
S & G	M.P. 2.60	
	W.C. 19.60 8-5-83	
	Elect. Cond 600	
	10-28	

GWA 1678

115X-83-28

9:34 TUESDAY, SEPTEMBER 13, 1963

CSAS

0.366683 0.02 0.0278373 21.2367 28.1813 29.0428 1760.67 -1.5054

2.65333 21053 0.00179083 0.0815435 0.16524 7.39151 0

SAMPLENO=HSX028

Hardness (Ca, Mg) = 588

1 114N-53W-26ADD 148 24 53 335.225 0.5 355 3.6 0.2 0.05 0.14 0.44 0.00 0.00 0.752441 0.00 0.00 768 1020 7.38523 1.0-393

LOC C N M A A G H C G C 3 L 2 K N E F A C M N S D O B

C 2 P H S T O N D K N B O E S

C A I X E

4 35855 0.00179083 0.00728067 0.00728067 5.49369 0.0141032 0.00736842 0.0314061 7.39121 12.8889 13.0847 755.768 -0.67757

HC O 3 K I M E C

S D 4 I M E C

4 2 1 0 2 3

P E R I D E E

S U M

SS0009 - END OF DATA SET

HSX-29 - 115N-52W-10Cdddd2 NO₃-N(only) = 5.0 $\frac{mg}{l}$
HSX-30 115N-52W-27Cdddd2 NO₃-N(only) = 0.6 $\frac{mg}{l}$
HSX-31 115N-52W-34Cdddd2 NO₃-N(only) = 64. $\frac{mg}{l}$

Boiled

Drilling log

115N - 50W - 270666

#2A - up gravel at 72 mi. on E side.

SOUTH DAKOTA GEOLOGICAL SURVEY

Location 115N-50W-270666

Location

Section:

T.

R.

Test Hole: CO-83-102

Well: CO-83-102

Land Owner:

County: HAMILIN

Date: 7-26-83

Elevation:

Lot: 44 49 20
Long: 97 04 02

E-Log: No

Samples: 2-12
12-31

Drilling Company: SDGS

Project: HAYTISJOK RWS

Geologist: A. J. - M. PALM

Rotary: L

Auger:

Driller: Stu (MI) Mitchell

Thickness	Lithologic Description	From - to Feet
0-2	SILT, FINE, SANDY, CLAYEY (TOP SOIL)	
2-7	GRAVEL, FINE, SANDY, ASSOCIATED BLACK CRYSTALLINE ROCK FRAGMENTS with some carbonate and quartz fragments.	
7-12	GRAVEL - MEDIUM TO COARSE, SANDY, MISCELLANEOUS PLATE CRYSTALLINE ROCK FRAGMENTS WITH SOME CARBONATES.	
12-31	GRAVEL, FINE SAND, FINE GRAVEL TO VERY COARSE SAND, MISCELLANEOUS BLACK CRYSTALLINE ROCK FRAGMENTS WITH CARBONATE ROCK FRAGMENTS AND SOME QUARTZ.	
31-56	SAND AND GRAVEL, FINE GRAVEL TO COARSE SAND, CLAYEY MISCELLANEOUS BLACK CRYSTALLINE FRAGMENTS AND SOME CARBONATE AND QUARTZ FRAGMENTS.	
TOTAL DEPTH 56'		
TOTAL CASING AND SCREEN - 33'		
5' steel pt. 5' setted above screen		
gravel packed well 1.2' stick up		
2" pt. SCH. 50		
W.L. 9.8 7-26-83		
0-2 TOPSOIL		
2-7 FINE GRAVEL		
7-12 MED GRAV		
12-31 FINE GRAV		
31-56 FINE GRAV CLAYEY		
W.L. 10.2 11-9-83		
Cased 600 11-9-83		
12-31		
31-56		
GWA 1676		

115N-83-48
and
115N-83-13

44° 45' 58"

Location

Section:

I.

R.

Well:

Land Owner:

Date:

7-27-83

Elevation: 1685(T)

Samples:

5-15
15-21

Drilling Company: SDGS

Geologist: *D. Holt*

Auger:

Driller: S. Mitchell

Thickness	Lithologic Description	From - to Feet
0-3	Silt, grayish black sandy (loose)	
3-21	Sand medium to very coarse, gravelly; mostly subangular calcareous, block crystalline rock fragments and quartz; contains some clay layers from 5 to 10 feet. (coal seam at 5 feet)	
21-36	Clay medium-dark-gray (?) very poor cuttings recovered	
	Total casing & screen 23 ft	
	5' sand point & 5' hook	
	Shots above sand point	
	Gravel pointed.	
	Wt. 8-3-33 G.I.	
	STEEL 2.1	
	Cord 400 8-2-83	
	G.W.A. 11.81	
	H5X-8B-23	

3.53e18 0.00179083 0.00182017 C.0409207 4.59472 0 0.169239 0.0157895 1.07066 2.7691 8.64095 8.61952 493.263 0.12418

9:34 TUESDAY, SEPTEMBER 13, 1983

SAS

SAMPLEND=HSX023

Hardness (cap Mg) = 271

1 115N-52a-150CCC 64 13 27 255.99 0 11 74 2.5 0.13 0.05 0.21 5.7 C C C C 0.66787 C C C 0 0 370 554 3.19361 0.565403

2.22039 C.00179083 0.00473244 0.0639386 4.19516 0 C.31027 0.0110526 0.406852 1.5407 6.06993 6.40406 342.994 -3.2093

Hardness (cap Mg) = 509

2 114N-53a-230AAA 128 23 46 316.94 C 12 502 4.3 0.79 0.05 0.22 0.23 0 0 0 0.769116 0 0 0 C 0 742 960 6.38723 1.50043

... coded

Drilling log

115N - 52W - 27CHDD

#2A - up gravel at 1/2 mi. on East side.

SOUTH DAKOTA GEOLOGICAL SURVEY.

Location 115N - 52W - 27CHDD

Location

Section:

T.

R.

Test Hole: CO-83-102

Well: CO-83-102

Land Owner:

Lat: 44 49 20

County: HAMILTON

Date: 7-26-83

Elevation:

1685 (f) Long: 97 09 02

E-Log: No

Samples:

2-12

12-31

Drilling Company: SDGS

Project: HAYTISTEUK RWS

Geologist: J. - M. PALM

Rotary: ✓

Auger:

Driller: Stu (HJ) Mitchell

Thickness	Lithologic Description	From - to Feet
0-2	SILT, FINE, SANDY, CLAYEY (TOP SOIL)	
2-7	GRAVEL, FINE, SANDY, Associated ^{CRYSTALLINE} BLACK ROCK FRAGMENTS with some carbonate and quartz fragments.	
7-12	GRAVEL - MEDIUM TO COARSE, SANDY, MISCELLANEOUS BLACK CRYSTALLINE ROCK FRAGMENTS WITH SOME CARBONATES.	
12-31	GRAVEL, MEDIUM SAND, FINE GRAVEL TO VERY COARSE SAND, MISCELLANEOUS BLACK CRYSTALLINE ROCK FRAGMENTS WITH CARBONATE ROCK FRAGMENTS AND SOME QUARTZ.	
31-56	CLAY, with SAND AND GRAVEL, FINE GRAVEL TO COARSE SAND, CLAYEY MISCELLANEOUS BLACK CRYSTALLINE FRAGMENTS and some CARBONATE and QUARTZ FRAGMENTS.	
TOTAL DEPTH 56'		56.0
TOTAL CASING AND SCREEN - 33'		
5' gravel pt. 5' scattered above screen		
gravel packed well 1.2' stick up		
2" at SCH. 50		
W.L. 9.8 7-26-83		
0-2 TOP SOIL		
2-7 FINE GRAVEL		
7-12 MED. GRAV		
12-31 FINE GRAV - SAND		
31-56 CLAYEY		
W.L.	0.2 11-7-83	115X-83-48
Casual	600 11-7-83	and 115X-83-13

GAS N
 LUC
 CA NA
 سائر الممتلكات والممتلكات، والممتلكات

CBS N	CA	NA MG	HCO3	CL	SO4 K	MN	FE	F	NO3_N	AS CD MO B	C_COND	CR	ZN PB	HG SE TDS	COND CA_MEQ					
12	1	114N-53W-36ABBB	108	25	462	4.9	1.13	0.05	0.38	0.2	0	0	0	0.95770	0	0	0	1073	1125	B.38323
CBS NA_MEQ	MG_MEQ	FE_MEQ	MN_MEQ	K_MEQ	HCO3_MEQ	CO3_MEQ	CL_MEQ	F_MEQ	NO3_MEQ	NH3_MEQ	SO4_MEQ	CAT	IONS	SUM	PEN_DIFF					
12	1.08743	5.42763	0.00179083	0.0411358	0.12532	7.19174	0	0.423095	0.02	0.0142755	9.61899	15.0065	7.2681	959.123	-6.8087					

SAMPLENO=HSX046 7-77 ($\frac{f}{\text{Hz}}$) =
Hutchings (Cn, Hg)
Date OK 12/8/83 mac

[illegible]

SAMPLEEND=HSX047

Data OK 1.1.783 1200

[illegible]

SAMPLE NO=H SX048

0124 of 12/17/03 19102

115N-524-27CB8B
 304.75 0
 0.91.2
 0.0429799 0.032703
 4.99426 0

150XSM-UNENIDM12

11-17-2017

QSS N LOC = CA NA MG HCO3 CO3 CL SO4 K MN FE F NO3 N AS CO MO B C COND CR ZN PB HG SE TDS COND CA_MG

No Permit; Date OK: 12/5/63 - mcs.

Hardness (Ca, Mg) = 111 / 1

117N - S.30W - 26.00000

Location

R.

Date: 8-7-83

Elevation: 16.95 (7) Loc. 97° 08' 51"
5065 Lat. 11° 39' 07"

Samples: 65-75
105-115

Drilling Company: SDG 5

Project: Hayti - Sioux RWS

Geologist: *D. Holtz*

Rotary: Combos

Auger:

Driller: S. Mitchell

#5X-83-28

GWA 1678

SOUTH DAKOTA GEOLOGICAL SURVEY

Location

Location 1141N - 55W - 23d009

Section:

T.

R.

Test Hole: CO-83-136

Well:

Land Owner:

County: Hamlin

Date: 8-3-83

Elevation: 1720 (T) Lat. 44° 08' 51" N. 101° 39' 58" W.

E-Log: No

Samples: 110-120
120-130

Drilling Company: SDG 5

Project: Hayti-Sioux River

Geologist: D. Helly

Rotary: Combo

Auger:

Driller: S. M. Lell

Thickness	Lithologic Description	From - to Feet
0-2	Silt, grayish-black sand (topsoil)	
2-22	Clay, dusky yellow to light-olive brown, silty sandy, gravelly, oxidized, calcareous (till)	
22-37	Clay, medium-dark gray, silty sandy, gravelly, unoxidized, calcareous (till)	
37-103	Clay, dusky-yellow to light olive brown, silty sandy, gravelly, oxidized, calcareous (till)	
103-130	Sand and gravel, medium sand to fine gravel with (some medium gravel, mostly subrounded quartz carbonate, iron and associated black and light crystalline rock fragments. may contain a few thin clay layers)	
130-146	Clay, light-olive brown to medium dark gray, silty, sandy, gravelly, partially oxidized, calcareous (till)	
	T.D. 146	
	Total casing & screen 132 feet	
	5' sandpoint & 15' back-sawn	
	slots above sandpoint	
	Gravel packed	
	Elect. conductivity 600	8-4-83
	M.P. 2.4'	
	W.C. 37.05	8-4-83
	GWT 16.83	

103-130 sand
130-146 clay

HSR-83-29

119N - S2W - 3b area

Section:

Location

T.

R

Well:

Land Owner:

Lot: 994302

Date: 7-20-83

Elevation: 1680 (7)

Long: 97 03 24

E-Log: No

Samples: $\frac{1}{2}$ ✓

Drilling Company: SDGS

Project: Hayti-Sugar PLS

Geologist: D. *W. H. H.*

Rotary: *Comb*

Auger:

Driller: S. M. - 1/2

Hsx-83-7 and

U.L. 4.8 11-9-83
Conrad 400 11-9-83

1 3.00270 0.00179083 0.00294823 0.021371 -
Hardness (Ca. 11g) = 375

Hardness (C₆₀) = 336
SAMPLE NO = HSA007

Hardness (Ca, Mg) = 529

[Faint handwritten notes and scribbles]

3 114N-52A-U3BAAA 87 17 20 255.99 0 6 101 4.04 U.S.M. U.S.M.

[illegible]

DATE	DESCRIPTION	AMOUNT	BALANCE
10/10/50	...	...	...
10/11/50	...	...	...
10/12/50	...	...	...
10/13/50	...	...	...
10/14/50	...	...	...
10/15/50	...	...	...
10/16/50	...	...	...
10/17/50	...	...	...
10/18/50	...	...	...
10/19/50	...	...	...
10/20/50	...	...	...
10/21/50	...	...	...
10/22/50	...	...	...
10/23/50	...	...	...
10/24/50	...	...	...
10/25/50	...	...	...
10/26/50	...	...	...
10/27/50	...	...	...
10/28/50	...	...	...
10/29/50	...	...	...
10/30/50	...	...	...
10/31/50	...	...	...

SAMPLE NO=MSX008

533 LUC 34 280-37 0 5 95 2.3 0.08 0.31 0.28 4.9 0 0 0 0 0.69599 0 0 0 0 538-773 4.52092 0.91344
 534 LUC 34 280-37 0 5 95 2.3 0.08 0.31 0.28 4.9 0 0 0 0 0.69599 0 0 0 0 538-773 4.52092 0.91344
 535 LUC 34 280-37 0 5 95 2.3 0.08 0.31 0.28 4.9 0 0 0 0 0.69599 0 0 0 0 538-773 4.52092 0.91344

1. The first part of the document is a title page. It contains the title of the document, the author's name, and the date of the document. The title is "The History of the United States of America". The author is "John Adams". The date is "1776".

