

STATE OF SOUTH DAKOTA  
William J. Janklow, Governor

DEPARTMENT OF WATER AND NATURAL RESOURCES  
Warren R. Neufeld, Secretary

GEOLOGICAL SURVEY  
Duncan J. McGregor, State Geologist

Open-File Report No. 31-UR

OBSERVATION WELLS IN THE VICINITY OF  
BROOKINGS, SOUTH DAKOTA

Constructed in 1979

by

Kelly Carter

Science Center  
University of South Dakota  
Vermillion, South Dakota

1980

CONTENTS

	Page
INTRODUCTION .....	1
REFERENCES CITED .....	1

ILLUSTRATION

Figure 1. Map showing the location of test holes and observation wells construction in 1979 .....	2
--	---

APPENDIX

A. Logs of test holes drilled in 1979 .....	3
---	---

## INTRODUCTION

This study was conducted by the South Dakota Geological Survey for the City of Brookings from June 7 to June 25, 1979. The purpose of the project was to install observation wells in order to monitor the water levels in the aquifers along the Deer Creek and Sixmile Creek.

The project was financed by the City of Brookings, the East Dakota Conservancy Sub-District, and the South Dakota Geological Survey.

Nineteen rotary test holes were drilled (fig. 1 and app. A) and observation wells were constructed in all except Test Hole BK-10-79. The wells are made of 2-inch diameter PVC casings with a 3-foot long sandpoint at the bottom. The casings are slotted for 5 feet above the sandpoints. The wells were back-flushed and posts were placed around them for protection.

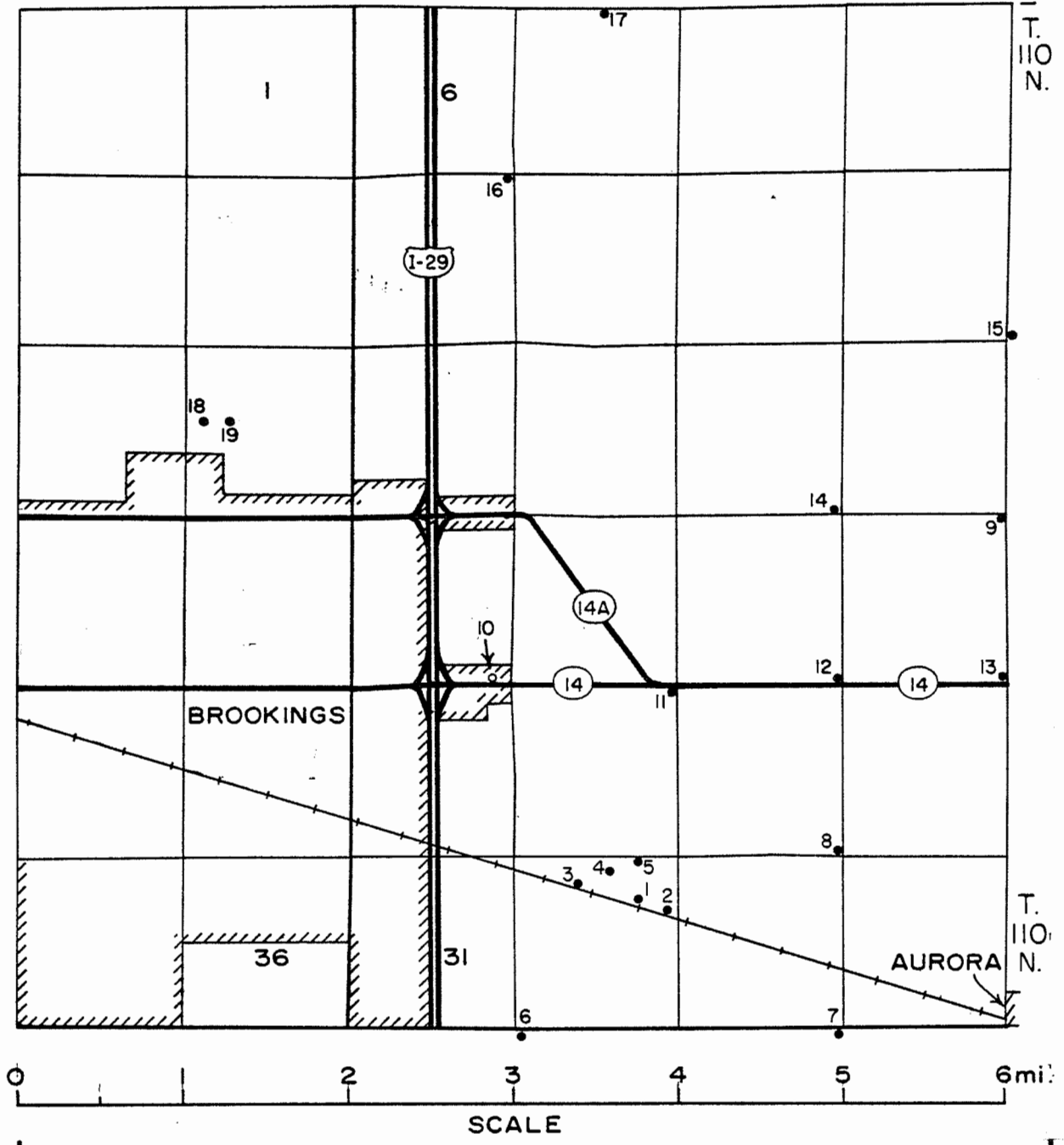
The elevations of the drill sites were taken from U.S. Geological Survey topographic maps and the water levels were measured on July 16, 1979 (app. A).

## REFERENCES CITED

U.S. Geological Survey, 1964, Brookings, South Dakota Quadrangle.

U.S. Geological Survey, 1964, Aurora, South Dakota Quadrangle.

R. 50 W. | R. 49 W.



- Test hole.
- Observation well.



Figure 1. Map showing the locations of test holes and observation wells construction in 1979.

APPENDIX A

Logs of test holes drilled in  
the Brookings vicinity in 1979

(for map location, see fig. 1)

All elevations have been estimated using  
a 7½ minute topographic map and are pre-  
sented in feet above mean sea level.

Test Hole BK-1-79

Location: NW¼NW¼SE¼NE¼ sec. 32, T. 110 N., R. 49 W.

Date Drilled: June 12, 1979

Elevation: 1615

Depth to water: 7.4 feet

0- 1	Topsoil, black, clayey
1- 8	Clay, black to gray, soft
8-22	Sand, fine to gravel, medium, well rounded
22-30	Clay, gray to brown, very sandy, gravelly

Observation well: 22 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-2-79

Location: SW¼NE¼SE¼NE¼ sec. 32, T. 110 N., R. 49 W.

Date Drilled: June 12, 1979

Elevation: 1615

Depth to water: 5.0 feet

0- 1	Topsoil, black, clayey
1- 9	Clay, black to gray, soft
9-40	Sand, fine to gravel, coarse, well rounded, with some small (½') clay lenses

Observation well: 20 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-3-79

Location: NW¼SE¼NE¼NW¼ sec. 32, T. 110 N., R. 49 W.

Date Drilled: June 13, 1979

Elevation: 1615

Depth to water: 3.1 feet

Test Hole BK-3-79 -- continued.

0- 1           Topsoil, black, clayey  
1-10           Clay, black to brown, soft  
10- 40          Sand, fine to gravel, medium, well rounded

Observation well: 30 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-4-79

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 32, T. 110 N., R. 49 W.

Date Drilled: June 12, 1979

Elevation: 1615

Depth to water: 8.98 feet

0-10           Clay, black to gray, soft  
10-39          Sand, fine to gravel, medium, well rounded  
39-42          Clay, gray, hard  
42-63          Sand, fine to coarse, subangular  
63-70          Clay, gray to brown, sandy, silty, pebbly  
              (till)

Observation well: 44 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-5-79

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 32, T. 110 N., R. 49 W.

Date Drilled: June 14, 1979

Elevation: 1613

Depth to water: 7.18 feet

0- 1           Topsoil, black, clayey  
1- 9           Clay, black to gray, soft  
9-38          Sand, fine to gravel, angular

Observation well: 20 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-6-79

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 5, T. 109 N., R. 49 W.

Date Drilled: June 13, 1979

Elevation: 1608

Depth to water: 6.27 feet

Test Hole BK-6-79 -- continued.

0- 2 Topsoil, black, very gravelly  
2-24 Sand, fine to gravel, medium, well rounded  
24-30 Clay, brown to gray, sandy, silty, pebbly  
(till)

Observation well: 20 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-7-79

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 4, T. 109 N., R. 49 W.

Date Drilled: June 13, 1979

Elevation: 1614

Depth to water: 6 feet

0- 1 Topsoil, black, clayey  
1- 8 Clay, brown to gray, very sandy  
8-28 Sand, fine to gravel, well rounded

Observation well: 27 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-8-79

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 28, T. 110 N., R. 49 W.

Date Drilled: June 14, 1979

Elevation: 1634

Depth to water: something stuck in well

0- 1 Topsoil, black, clayey  
1- 5 Clay, brown, very pebbly  
5-28 Sand, fine to gravel, well rounded

Observation well: 17 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-9-79

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 22, T. 110 N., R. 49 W.

Date Drilled: June 14, 1979

Elevation: 1643

Depth to water: 12.7 feet

0- 2 Topsoil, black, sandy

Test Hole BK-9-79 -- continued.

2-35 Sand, fine to gravel, coarse, well rounded  
35-40 Clay, brown, sandy, silty, pebbly (till)

Observation well: 27 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-10-79

Location: SE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 19, T. 110 N., R. 49 W.

Date Drilled: June 18, 1979

Elevation: 1628

Depth to water: not measured

0- 1 Topsoil, black, clayey  
1- 5 Clay, gray, sandy  
5-25 Clay, brown, sandy, pebbly  
25-48 Clay, gray, sandy, silty, pebbly (till)

\* \* \* \*

Test Hole BK-11-79

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 29, T. 110 N., R. 49 W.

Date Drilled: June 18, 1979

Elevation: 1623

Depth to water: 4.6 feet

0- 1 Topsoil, black, clayey  
1-18 Sand, fine to gravel, oxidized  
18-28 Sand, fine, silty  
28-42 Sand, fine to gravel, unoxidized  
42-50 Clay, brown to gray, sandy, silty, pebbly (till)

Observation well: 36 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-12-79

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 21, T. 110 N., R. 49 W.

Date Drilled: June 19, 1979

Elevation: 1638

Depth to water: 18.47 feet

0- 1 Topsoil, black, clayey  
1- 3 Clay, brown, pebbly  
3-29 Sand, fine to gravel, angular  
29-34 Sand, coarse to gravel, angular



Test Hole BK-12-79 -- continued.

34-46 Clay, gray, silty, sandy, pebbly (till)  
46-50 Clay, gray, silty, sandy

Observation well: 32 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-13-79

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 22, T. 110 N., R. 49 W.

Date Drilled: June 19, 1979

Elevation: 1653

Depth to water: 11.18 feet

0- 1 Topsoil, black, clayey  
1- 8 Clay, brown, sandy, pebbly  
8-46 Sand, medium to gravel, angular  
46-55 Clay, brown, sandy, pebbly  
55-60 Clay, gray, sandy, silty

Observation well: 37 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-14-79

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 16, T. 110 N., R. 49 W.

Date Drilled: June 19, 1979

Elevation: 1633

Depth to water: 6.5 feet

0- 1 Topsoil, black, clayey  
1- 8 Clay, brown, some pebbles  
8-17 Sand, fine to gravel, well rounded  
17-28 Clay, brown to tan, sandy, silty, pebbly (till)

Observation well: 17 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-15-79

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 11, T. 110 N., R. 49 W.

Date Drilled: June 20, 1979

Elevation: 1645

Depth to water: 8.64 feet

0- 1 Topsoil, black, clayey

Test Hole BK-15-79 -- continued.

1- 4 Clay, brown, pebbly  
4-28 Sand, fine to gravel, well rounded  
28-38 Clay, gray, silty, sandy, pebbly (till)

Observation well: 20 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-16-79

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 7, T. 110 N., R. 49 W.

Date Drilled: June 20, 1979

Elevation: 1633

Depth to water: 4.45 feet

0- 1 Topsoil, black, clayey  
1- 6 Clay, brown, pebbly  
6-52 Sand, fine to gravel, well rounded  
52-58 Clay, brown, sandy, silty, pebbly (till)

Observation well: 20 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-17-79

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 5, T. 110 N., R. 49 W.

Date Drilled: June 22, 1979

Elevation: 1646

Depth to water: 6.6 feet

0- 4 Clay, black, sandy (topsoil)  
4-34 Sand, coarse to gravel, coarse, angular  
34-45 Sand, coarse to gravel, coarse, very silty  
and clayey  
45-68 Sand, fine to gravel, very coarse, angular  
to subrounded  
68-80 Clay, brown, sandy, silty, pebbly, some large  
cobbles (oxidized till)

Observation well: 40 feet of 2-inch diameter  
PVC and a 3-foot sandpoint with 5 feet of  
slots above the sandpoint.

\* \* \* \*

Test Hole BK-18-79

Location: SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 13, T. 110 N., R. 50 W.

Date Drilled: June 22, 1979

Elevation: 1614

Depth to water: 11.65 feet

0- 2	Clay, black (topsoil)
2- 9	Clay, black to brown, sandy
9-36	Gravel, coarse to sandy, medium, angular to subangular
36-50	Sand, fine and gravel, fine, subangular to rounded
50-60	Clay, gray-green, sandy, pebbly, some large cobbles (till?)

Observation well: 40 feet of 2-inch diameter PVC and a 3-foot sandpoint with 5 feet of slots above the sandpoint.

(NOTE: see BK-19-79)

\* \* \* \*

Test Hole BK-19-79

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 13, T. 110 N., R. 50 W.

Date Drilled: June 22, 1979

Elevation: 1610

Depth to water: 7.65 feet

0- 2	Clay, black (topsoil)
2- 7	Clay, brown to black, sandy
7-32	Sand, fine to gravel, coarse, angular to subangular
32-50	Clay, gray-green, sandy, pebbly, some large cobbles

Observation well: 20 feet of 2-inch diameter PVC and a 3-foot sandpoint with 5 feet of slots above the sandpoint.

(NOTE: to get to the observation well one must go in the farm next to the city wells. The observation wells (No. 18 and 19) are next to the fence.)

\* \* \* \*