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William J. Janklow, Governor

DEPARTMENT OF WATER AND NATURAL RESOURCES  
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GEOLOGICAL SURVEY  
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TRIPP PETROLEUM LEAK

by

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## DEFINITION OF TERMS

**Till:** An unconsolidated sediment containing all sizes of fragments from clay to boulders deposited by glacial action, usually nonbedded (Press and Siever, 1974). The till encountered in drilling for this investigation consisted primarily of a clay matrix with varying amounts of silt, sand, and pebbles. Till can be fractured and may contain sand lenses.

**Hydraulic conductivity:** The volume of water that will move in unit time under a unit ground-water gradient through a unit area measured at right angles to the direction of flow.

## INTRODUCTION

At the request of the City of Tripp, the South Dakota Geological Survey investigated the hydrogeology of an area near a residence in Tripp that reportedly had gasoline fumes present in the basement. The field work was conducted in 1984 and included the drilling of 10 test holes, in which 9 observation wells were installed. The relative elevations of the observation wells were surveyed and water levels were measured on three occasions.

## BACKGROUND

To put things in perspective, a brief outline of events leading up to the Geological Survey's involvement is as follows. All information was gathered directly by the writer.

1. There was a loss of gasoline in 1978 from at least one of the buried gasoline tanks at the Cenex Station in Tripp. The tanks were located near the southeast corner of the station. This loss of gasoline is acknowledged by Dennis Merkwan, the present manager of the station.
2. The duration and magnitude of this loss has not been made known to the Geological Survey.
3. Richard West, the owner of a house across the street east of the Cenex Station, reportedly experienced gasoline fume problems in his basement in 1978. The duration of this fume problem was not made known to the Geological Survey. Mr. West did say, however, that the fumes later ceased to be a problem.
4. Both buried gasoline tanks (for leaded and unleaded gasoline) at the Cenex Station were replaced in 1978 after gasoline fumes were detected by Richard West in his home.
5. During the summer of 1983, the presence of water was noted in one of the buried tanks emplaced in 1978 but there was no loss of gasoline then, nor had there ever been any loss of gasoline from that tank, according to Dennis Merkwan (Cenex Station Manager).
6. Both of the buried tanks which were installed in 1978 were replaced in the summer or fall of 1983. The reason given by Dennis Merkwan for replacement of both tanks was that the presence of water was noted in one tank.
7. There has been no reported loss of gasoline at the Cenex Station since 1978.
8. Richard West reportedly began having gasoline fume problems again on January 5, 1984.

It was at this point that the Geological Survey became involved.

### OBSERVATION-WELL CONSTRUCTION

All holes were drilled using the flight-auger method (4-inch diameter) to a depth of 17 or 18 feet (app.). The casing for each observation well consists of one 20-foot length of 2-inch diameter, 160 psi PVC. Vertical, overlapping slots were cut in the lower 14 feet of the casing using a circular saw. The observation-well bottom was capped with a 2-inch diameter slip cap which was not glued to the casing. The observation well was gravel packed with quartzite chips to within 2.5 to 3.5 feet of ground surface (depending on the drill-hole depth). The remainder of the annulus was filled with powdered bentonite to provide a seal at the top of the observation well. Locations of the observation wells are shown on figure 1.

### WATER LEVELS

All observation wells are completed in glacial till. Wells installed in till have water levels that may be inconsistent over short distances and may take weeks or months to reach equilibrium with the ground-water level. This is because of the generally low but locally varying hydraulic conductivities that are dependent upon lithologic and physical characteristics of the till (i.e., sand lens, clay matrix, fractures, etc.). As a result, water levels and ground-water gradients in a relatively small area, such as that studied in Tripp, are very difficult to evaluate in detail especially during a short period of monitoring. It can be stated, however, that there is a general potential for lateral ground-water movement toward the east through the problem area (fig. 2). This ground-water gradient would allow migration of gasoline from the vicinity of Cenex's buried tanks to the vicinity of the Richard West residence. The relative elevations of the observation wells and the depth to water from casing top are listed in table 1.

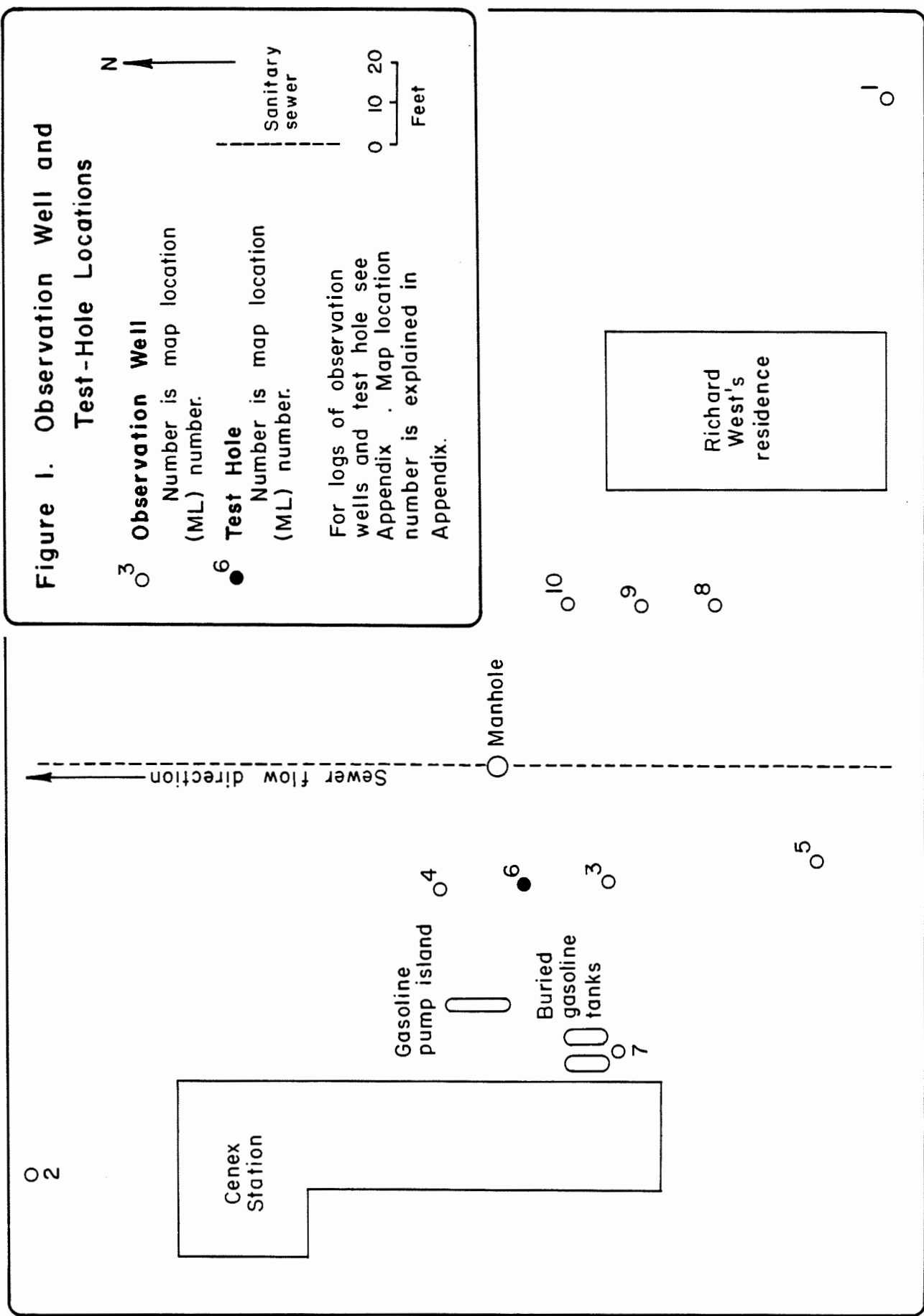
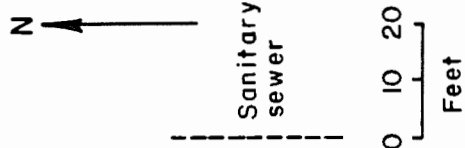
### CONTAMINATION

The intent of the drilling was to determine the extent of gasoline contamination in the ground and establish the ground-water gradient through the problem area. The sediments in 8 of the 10 holes drilled appeared to be contaminated with a petroleum product using visual appearance and odor as criteria for determining the presence of contamination. One of the two holes that did not exhibit contaminated sediments is located north of, and upgradient from, the Cenex Station and the other is located southeast of, and is the farthest downgradient from, the Cenex Station (figs. 2 and 3).

**Figure 1. Observation Well and Test-Hole Locations**

- <sup>3</sup> **Observation Well**  
Number is map location (ML) number.
- <sup>6</sup> **Test Hole**  
Number is map location (ML) number.

For logs of observation wells and test hole see Appendix. Map location number is explained in Appendix.



**Figure 2. Water-Level Elevations:**

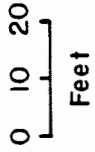
April 17, 1984



**Observation Well**

Number is relative elevation, in feet, of water in observation well. All numbers are relative to an arbitrary datum of 100.00.

Sanitary sewer



**Test Hole**

96.44  
○



95.66  
○

95.88  
○

96.44  
○

95.65  
○

← Sewer flow direction

○ Manhole

98.81  
○

Cenex Station

Gasoline pump island  
98.42  
○

Buried gasoline tanks

98.16  
○

95.08  
○

Richard West's residence



98.61  
○

TABLE 1

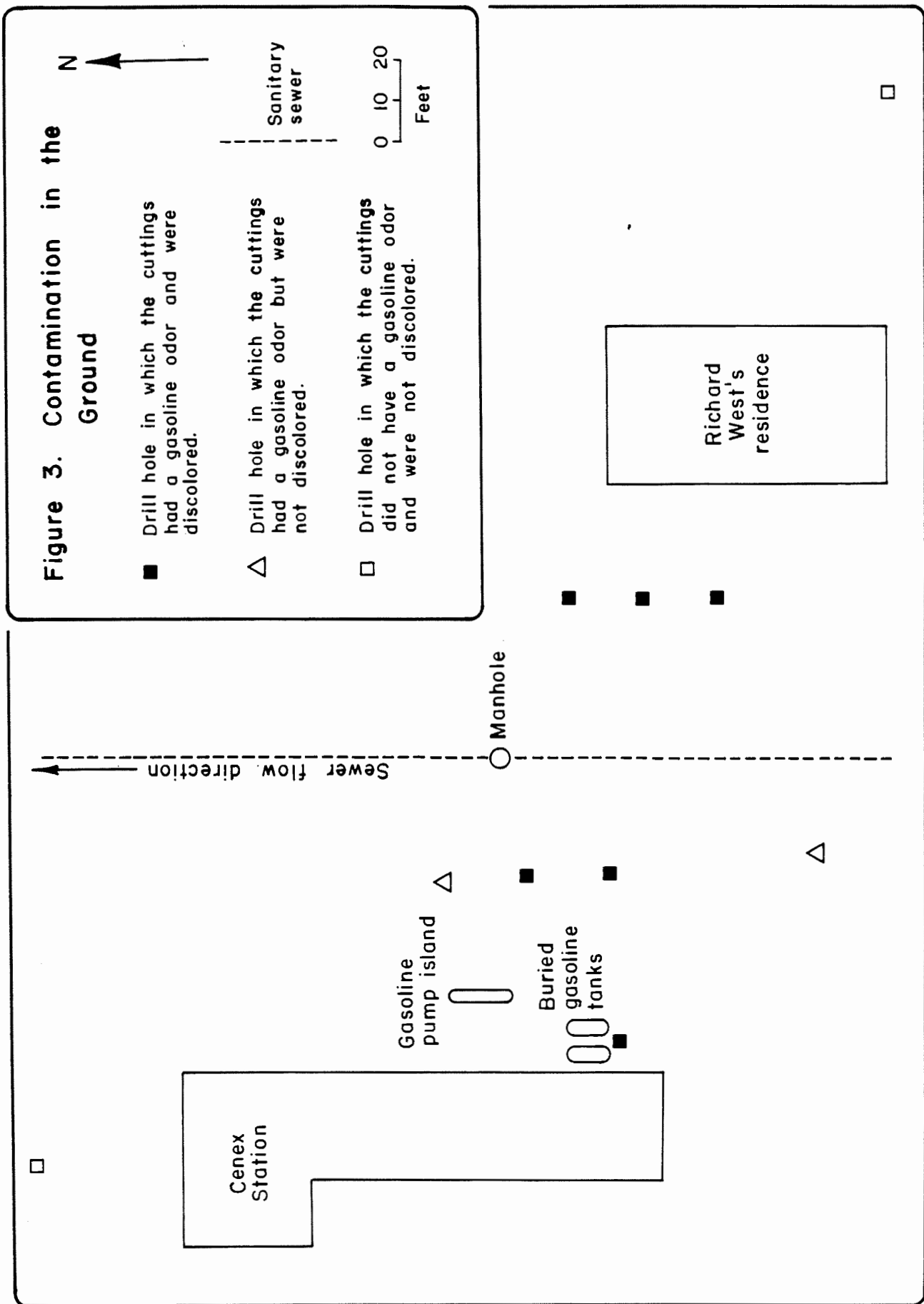
Surveying and water-level measurements

Well map location number *	Relative elevation of casing top (ft)**	Depth to water from casing top (ft)		
		1-18-84	1-25-84	4-17-84
1	99.42	15.07	14.07	3.77
2	102.29	dry	17.68	3.48
3	102.52	8.09	8.06	4.36
4	102.48	7.76	8.09	4.06
5	102.68	9.63	9.67	7.60
7	103.44	8.79	8.86	4.83
8	100.66	11.64	9.77	4.22
9	100.47	9.26	9.19	4.59
10	100.38	18.85	10.62	4.72

\* For location, see figure 1. For explanation of map location (ML) number, see appendix.

\*\* All elevations are relative to an assumed datum of 100.00





Drill cuttings from the eight contaminated holes all had an odor of gasoline which was present at various depths and to varying degrees (app.). Another characteristic observed in six of the eight contaminated holes was a discoloration of the normal yellow or yellow-brown color of the weathered till to a yellow-gray, gray, olive-brown, or olive-green color. The two drill holes which had a gasoline odor but which showed no discoloration of the sediment -- holes at map locations (ML) 4 and 5, figs. 1 and 3, app. -- are assumed to be on the fringes of the contaminant plume.

The manhole for the sanitary sewer in the street east of the Cenex Station and apparently in the path of the contaminant plume was checked for the presence of gasoline on January 25, 1984. No gasoline odor was detected and no liquid gasoline was observed. It is believed that this is because gasoline in the ground is present in residual quantities only and any gasoline in the sediment surrounding the sanitary sewer has already volatilized to the extent where it cannot be detected by smell.

Test drilling and subsequent monitoring of observation wells support the interpretation that gasoline contamination is present in the form of residual saturation in the sediments and/or in the form of dissolved gasoline in the ground water. Although fresh cuttings may have appeared wet with gasoline and observation wells may have had a strong gasoline odor when first installed, the odor subsided within a few days and no accumulation of gasoline was ever observed in the wells.

## CONCLUSIONS

The general potential for lateral ground-water movement is from the Cenex Station toward the vicinity of the Richard West residence. Deposits in drill holes west of the Richard West residence, with the exception of the hole at ML 2 (fig. 1), were contaminated with gasoline. Contamination in the ground and the reported gasoline fume problem in the Richard West residence is most likely the result of gasoline loss in the property of the Cenex Station. This interpretation is supported by the site specific hydrogeologic conditions and the fact that there are no other known buried gasoline tanks within a one-to-two block radius of the Cenex Station.

## REFERENCE

Press, Frank, and Siever, Raymond, 1974, Earth: W. H. Freeman and Company, San Francisco.

## APPENDIX

### Logs of test holes and observation wells

#### MAP LOCATION (ML)

A number which is arbitrarily assigned to the log according to the order in which it is listed (see LEGAL LOCATION and LOCATION). This number corresponds to the numbers shown on figure 1.

#### LEGAL LOCATION and LOCATION

The logs are listed by smallest township number, then the smallest range number, the smallest section number, and then by quarter section: NE = A; NW = B; SW = C; SE = D.

#### LATITUDE and LONGITUDE

The format is DD.MMSS where D is degrees, M is minutes, and S is seconds.

#### DRILLING COMPANY

SDGS is an abbreviation for South Dakota Geological Survey.

#### TOTAL DRILL HOLE DEPTH and SCREEN LENGTH

The numbers are presented in feet.

#### SCREEN TYPE and CASING TYPE

PVC - polyvinylchloride; HM. - home made.

#### CASING-TOP ELEVATION and GROUND-SURFACE ELEVATION

The numbers are presented in feet above mean sea level. The (T) following the number means that the elevation was estimated from a 7-1/2 minute series topographic map.

#### CASING DIAMETER

The numbers are presented in inches.

COUNTY: HUTCHINSON LOCATION: 097N-60W-17BDAC  
 MAP LOCATION: 1  
 LEGAL LOCATION: SW NE SE NW SEC. 17, T. 097 N., R. 60 W.  
 LATITUDE: 43.1317 LONGITUDE: 97.5753  
 LAND OWNER:  
 PROJECT: TRIPP PETROLEUM LEAK  
 DRILLING COMPANY: SDGS  
 DRILLER: M. THOMPSON DRILLER'S LOG:  
 GEOLOGIST: D. ILES GEOLOGIST'S LOG: X  
 DATE DRILLED: 01-17-1984 DRILLING METHOD: AUGER  
 GROUND SURFACE ELEVATION: 1556.00 T  
 TOTAL DRILL HOLE DEPTH: 18 TEST HOLE NUMBER: A1-84-31  
 WATER RIGHTS WELL: SDGS WELL NAME: A1-84-31  
 OTHER WELL NAME:  
 BASIN: JAMES AQUIFER: TILL  
 MANAGEMENT UNIT:  
 SCREEN TYPE: PVC, HM. SCREEN LENGTH: 14.0  
 CASING TYPE: PVC CASING DIAMETER: 2.0  
 CASING TOP ELEVATION:  
 CASING STICK-UP: 2.00 TOTAL CASING AND SCREEN: 20.0  
 WELL MAINTENANCE DATE:  
 USGS HYDROLOGICAL UNIT CODE: 10160011  
 ELECTRIC LOG INFORMATION:  
 SPONTANEOUS POTENTIAL: SINGLE POINT RESISTIVITY:  
 NATURAL GAMMA: EXTRA:  
 SAMPLES:

THE WELL SCREEN CONSISTS OF VERTICAL OVERLAPPING  
 SLOTS CUT IN THE 160 PSI CASING WITH A CIRCULAR  
 SAW. THE WELL BOTTOM IS CAPPED WITH A SLIP CAP  
 (NOT GLUED). THE WELL WAS GRAVEL PACKED WITH  
 QUARTZITE CHIPS AND SEALED AT THE TOP WITH  
 BENTONITE.

0 - 6 TOPSOIL, BLACK  
 6 - 18 CLAY, YELLOW-BROWN, SILTY, SANDY, PEBBLY  
 (TILL)

\* \* \* \*

COUNTY: HUTCHINSON LOCATION: 097N-60W-17BDBA  
 MAP LOCATION: 2  
 LEGAL LOCATION: NE NW SE NW SEC. 17, T. 097 N., R. 60 W.  
 LATITUDE: 43.1318 LONGITUDE: 97.5753  
 LAND OWNER:  
 PROJECT: TRIPP PETROLEUM LEAK  
 DRILLING COMPANY: SDGS  
 DRILLER: M. THOMPSON DRILLER'S LOG:  
 GEOLOGIST: D. ILES GEOLOGIST'S LOG: X

DATE DRILLED: 01-17-1984 DRILLING METHOD: AUGER  
 GROUND SURFACE ELEVATION: 1559.00 T  
 TOTAL DRILL HOLE DEPTH: 18 TEST HOLE NUMBER: A1-84-32  
 WATER RIGHTS WELL: SDGS WELL NAME: A1-84-32  
 OTHER WELL NAME:  
 BASIN: JAMES AQUIFER: TILL  
 MANAGEMENT UNIT:  
 SCREEN TYPE: PVC, HM. SCREEN LENGTH: 14.0  
 CASING TYPE: PVC CASING DIAMETER: 2.0  
 CASING TOP ELEVATION:  
 CASING STICK-UP: 2.00 TOTAL CASING AND SCREEN: 20.0  
 WELL MAINTENANCE DATE:  
 USGS HYDROLOGICAL UNIT CODE: 10160011  
 ELECTRIC LOG INFORMATION:  
 SPONTANEOUS POTENTIAL: SINGLE POINT RESISTIVITY:  
 NATURAL GAMMA: EXTRA:  
 SAMPLES:

THE WELL SCREEN CONSISTS OF VERTICAL OVERLAPPING  
 SLOTS CUT IN THE 160 PSI CASING WITH A CIRCULAR  
 SAW. THE WELL BOTTOM IS CAPPED WITH A SLIP CAP  
 (NOT GLUED). THE WELL WAS GRAVEL PACKED WITH  
 QUARTZITE CHIPS AND SEALED AT THE TOP WITH  
 BENTONITE.

0 - 5 TOPSOIL, BLACK  
 5 - 18 CLAY, YELLOW-BROWN, SILTY, SANDY, PEBBLY  
 (TILL)

\* \* \* \*

COUNTY: HUTCHINSON LOCATION: 097N-60W-17BDBD 1  
 MAP LOCATION: 3  
 LEGAL LOCATION: SE NW SE NW SEC. 17, T. 097 N., R. 60 W.  
 LATITUDE: 43.1317 LONGITUDE: 97.5755  
 LAND OWNER:  
 PROJECT: TRIPP PETROLEUM LEAK  
 DRILLING COMPANY: SDGS  
 DRILLER: L. HELSETH DRILLER'S LOG:  
 GEOLOGIST: D. ILES GEOLOGIST'S LOG: X  
 DATE DRILLED: 01-16-1984 DRILLING METHOD: AUGER  
 GROUND SURFACE ELEVATION: 1559.00 T  
 TOTAL DRILL HOLE DEPTH: 17 TEST HOLE NUMBER: R3-84-5  
 WATER RIGHTS WELL: SDGS WELL NAME: R3-84-5  
 OTHER WELL NAME:  
 BASIN: JAMES AQUIFER: TILL  
 MANAGEMENT UNIT:  
 SCREEN TYPE: PVC, HM. SCREEN LENGTH: 14.0  
 CASING TYPE: PVC CASING DIAMETER: 2.0

CASING TOP ELEVATION:  
CASING STICK-UP: 3.00 TOTAL CASING AND SCREEN: 20.0  
WELL MAINTENANCE DATE:  
USGS HYDROLOGICAL UNIT CODE: 10160011  
ELECTRIC LOG INFORMATION:  
SPONTANEOUS POTENTIAL: SINGLE POINT RESISTIVITY:  
NATURAL GAMMA: EXTRA:  
SAMPLES:

THE WELL SCREEN CONSISTS OF VERTICAL OVERLAPPING SLOTS CUT IN THE 160 PSI CASING WITH A CIRCULAR SAW. THE WELL BOTTOM IS CAPPED WITH A SLIP CAP (NOT GLUED). THE WELL WAS GRAVEL PACKED WITH QUARTZITE CHIPS AND SEALED AT THE TOP WITH BENTONITE.

0 -	5	CLAY, GRAY, SILTY, SANDY, PEBBLY
5 -	10	CLAY, DARK-GRAY TO BLACK, SILTY, SANDY, PEBBLY; APPEARED WET, VERY STRONG GASOLINE ODOR (TILL)
10 -	17	CLAY, GRAY, SILTY, SANDY, PEBBLY; APPEARED WET, LESS GASOLINE ODOR THAN INTERVAL FROM 5 TO 10 FEET (TILL)

\* \* \* \*

COUNTY: HUTCHINSON LOCATION: 097N-60W-17BDBD 2  
MAP LOCATION: 4  
LEGAL LOCATION: SE NW SE NW SEC. 17, T. 097 N., R. 60 W.  
LATITUDE: 43.1317 LONGITUDE: 97.5755  
LAND OWNER:  
PROJECT: TRIPP PETROLEUM LEAK  
DRILLING COMPANY: SDGS  
DRILLER: L. HELSETH DRILLER'S LOG:  
GEOLOGIST: D. ILES GEOLOGIST'S LOG: X  
DATE DRILLED: 01-17-1984 DRILLING METHOD: AUGER  
GROUND SURFACE ELEVATION: 1559.00 T  
TOTAL DRILL HOLE DEPTH: 17 TEST HOLE NUMBER: R3-84-6  
WATER RIGHTS WELL: SDGS WELL NAME: R3-84-6  
OTHER WELL NAME:  
BASIN: JAMES AQUIFER: TILL  
MANAGEMENT UNIT:  
SCREEN TYPE: PVC, HM. SCREEN LENGTH: 14.0  
CASING TYPE: PVC CASING DIAMETER: 2.0  
CASING TOP ELEVATION:  
CASING STICK-UP: 3.00 TOTAL CASING AND SCREEN: 20.0  
WELL MAINTENANCE DATE:  
USGS HYDROLOGICAL UNIT CODE: 10160011  
ELECTRIC LOG INFORMATION:

SPONTANEOUS POTENTIAL:  
NATURAL GAMMA:  
SAMPLES:

SINGLE POINT RESISTIVITY:  
EXTRA:

THE WELL SCREEN CONSISTS OF VERTICAL OVERLAPPING SLOTS CUT IN THE 160 PSI CASING WITH A CIRCULAR SAW. THE WELL BOTTOM IS CAPPED WITH A SLIP CAP (NOT GLUED). THE WELL WAS GRAVEL PACKED WITH QUARTZITE CHIPS AND SEALED AT THE TOP WITH BENTONITE.

0 - 3 CLAY, GRAY  
3 - 17 CLAY, YELLOW, SILTY, SANDY, PEBBLY;  
SLIGHT GASOLINE ODOR AT 5 FEET (TILL)

\* \* \* \*

COUNTY: HUTCHINSON LOCATION: 097N-60W-17BDBD 3  
MAP LOCATION: 5  
LEGAL LOCATION: SE NW SE NW SEC. 17, T. 097 N., R. 60 W.  
LATITUDE: 43.1317 LONGITUDE: 97.5755  
LAND OWNER:  
PROJECT: TRIPP PETROLEUM LEAK  
DRILLING COMPANY: SDGS  
DRILLER: L. HELSETH DRILLER'S LOG:  
GEOLOGIST: D. ILES GEOLOGIST'S LOG: X  
DATE DRILLED: 01-17-1984 DRILLING METHOD: AUGER  
GROUND SURFACE ELEVATION: 1559.00 T  
TOTAL DRILL HOLE DEPTH: 17 TEST HOLE NUMBER: R3-84-7  
WATER RIGHTS WELL: SDGS WELL NAME: R3-84-7  
OTHER WELL NAME:  
BASIN: JAMES AQUIFER: TILL  
MANAGEMENT UNIT:  
SCREEN TYPE: PVC, HM. SCREEN LENGTH: 14.0  
CASING TYPE: PVC CASING DIAMETER: 2.0  
CASING TOP ELEVATION:  
CASING STICK-UP: 3.00 TOTAL CASING AND SCREEN: 20.0  
WELL MAINTENANCE DATE:  
USGS HYDROLOGICAL UNIT CODE: 10160011  
ELECTRIC LOG INFORMATION:  
SPONTANEOUS POTENTIAL: SINGLE POINT RESISTIVITY:  
NATURAL GAMMA: EXTRA:  
SAMPLES:

THE WELL SCREEN CONSISTS OF VERTICAL OVERLAPPING SLOTS CUT IN THE 160 PSI CASING WITH A CIRCULAR SAW. THE WELL BOTTOM IS CAPPED WITH A SLIP CAP (NOT GLUED). THE WELL WAS GRAVEL PACKED WITH QUARTZITE CHIPS AND SEALED AT THE TOP WITH

BENTONITE.

0 - 5 CLAY, GRAY, SILTY, SANDY, PEBBLY (TILL)  
5 - 10 CLAY, YELLOW, SILTY, SANDY, PEBBLY (TILL)  
10 - 11 CLAY, YELLOW-BROWN, SILTY, SANDY,  
PEBBLY; VERY SLIGHT GASOLINE ODOR  
(TILL)  
11 - 17 CLAY, YELLOW-BROWN, SILTY, SANDY,  
PEBBLY (TILL)

\* \* \* \*

COUNTY: HUTCHINSON LOCATION: 097N-60W-17BDBD 4  
MAP LOCATION: 6  
LEGAL LOCATION: SE NW SE NW SEC. 17, T. 097 N., R. 60 W.  
LATITUDE: 43.1317 LONGITUDE: 97.5755  
LAND OWNER:  
PROJECT: TRIPP PETROLEUM LEAK  
DRILLING COMPANY: SDGS  
DRILLER: L. HELSETH DRILLER'S LOG:  
GEOLOGIST: D. ILES GEOLOGIST'S LOG: X  
DATE DRILLED: 01-17-1984 DRILLING METHOD: AUGER  
GROUND SURFACE ELEVATION: 1559.00 T  
TOTAL DRILL HOLE DEPTH: 17 TEST HOLE NUMBER: R3-84-8  
USGS HYDROLOGICAL UNIT CODE: 10160011  
ELECTRIC LOG INFORMATION:  
SPONTANEOUS POTENTIAL: SINGLE POINT RESISTIVITY:  
NATURAL GAMMA: EXTRA:  
SAMPLES:

0 - 4 CLAY, GRAY, SILTY, SANDY, PEBBLY  
4 - 5 CLAY, DARK-BROWN, SILTY, SANDY, PEBBLY  
(TILL)  
5 - 6 CLAY, OLIVE-BROWN, SILTY, SANDY, PEBBLY;  
SLIGHT GASOLINE ODOR (TILL)  
6 - 17 CLAY, OLIVE-GREEN, SILTY, SANDY, PEBBLY;  
MORE GASOLINE ODOR THAN INTERVAL FROM  
5 TO 6 FEET (TILL)

\* \* \* \*

COUNTY: HUTCHINSON LOCATION: 097N-60W-17BDBD 5  
MAP LOCATION: 7  
LEGAL LOCATION: SE NW SE NW SEC. 17, T. 097 N., R. 60 W.  
LATITUDE: 43.1317 LONGITUDE: 97.5755



LAND OWNER:  
 PROJECT: TRIPP PETROLEUM LEAK  
 DRILLING COMPANY: SDGS  
 DRILLER: L. HELSETH  
 GEOLOGIST: D. ILES  
 DATE DRILLED: 01-17-1984  
 GROUND SURFACE ELEVATION: 1560.00 T  
 TOTAL DRILL HOLE DEPTH: 17  
 WATER RIGHTS WELL:  
 OTHER WELL NAME:  
 BASIN: JAMES  
 MANAGEMENT UNIT:  
 SCREEN TYPE: PVC, HM.  
 CASING TYPE: PVC  
 CASING TOP ELEVATION:  
 CASING STICK-UP: 3.00  
 WELL MAINTENANCE DATE:  
 USGS HYDROLOGICAL UNIT CODE: 10160011  
 ELECTRIC LOG INFORMATION:  
 SPONTANEOUS POTENTIAL:  
 NATURAL GAMMA:  
 SAMPLES:

DRILLER'S LOG:  
 GEOLOGIST'S LOG: X  
 DRILLING METHOD: AUGER  
 TEST HOLE NUMBER: R3-84-9  
 SDGS WELL NAME: R3-84-9  
 AQUIFER: TILL  
 SCREEN LENGTH: 14.0  
 CASING DIAMETER: 2.0  
 TOTAL CASING AND SCREEN: 20.0  
 SINGLE POINT RESISTIVITY:  
 EXTRA:

THE WELL SCREEN CONSISTS OF VERTICAL OVERLAPPING  
 SLOTS CUT IN THE 160 PSI CASING WITH A CIRCULAR  
 SAW. THE WELL BOTTOM IS CAPPED WITH A SLIP CAP  
 (NOT GLUED). THE WELL WAS GRAVEL PACKED WITH  
 QUARTZITE CHIPS AND SEALED AT THE TOP WITH  
 BENTONITE.

0 -	1	CLAY, GRAY
1 -	3	CLAY, GRAY, SILTY, SANDY, PEBBLY
3 -	13	CLAY, DARK-GRAY, SILTY, SANDY, PEBBLY; STRONG GASOLINE ODOR (TILL)
13 -	17	CLAY, YELLOW-BROWN, SILTY, SANDY, PEBBLY (TILL)

\* \* \* \*

COUNTY: HUTCHINSON  
 MAP LOCATION: 8  
 LEGAL LOCATION: SE NW SE NW SEC. 17, T. 097 N., R. 60 W.  
 LATITUDE: 43.1317  
 LAND OWNER:  
 PROJECT: TRIPP PETROLEUM LEAK  
 DRILLING COMPANY: SDGS  
 DRILLER: M. THOMPSON  
 GEOLOGIST: D. ILES  
 DATE DRILLED: 01-17-1984

LOCATION: 097N-60W-17BDBD 6  
 LONGITUDE: 97.5755  
 DRILLER'S LOG:  
 GEOLOGIST'S LOG: X  
 DRILLING METHOD: AUGER

GROUND SURFACE ELEVATION: 1557.00 T  
TOTAL DRILL HOLE DEPTH: 18 TEST HOLE NUMBER: A1-84-28  
WATER RIGHTS WELL: SDGS WELL NAME: A1-84-28  
OTHER WELL NAME:  
BASIN: JAMES AQUIFER: TILL  
MANAGEMENT UNIT:  
SCREEN TYPE: PVC, HM. SCREEN LENGTH: 14.0  
CASING TYPE: PVC CASING DIAMETER: 2.0  
CASING TOP ELEVATION:  
CASING STICK-UP: 2.00 TOTAL CASING AND SCREEN: 20.0  
WELL MAINTENANCE DATE:  
USGS HYDROLOGICAL UNIT CODE: 10160011  
ELECTRIC LOG INFORMATION:  
SPONTANEOUS POTENTIAL: SINGLE POINT RESISTIVITY:  
NATURAL GAMMA: EXTRA:  
SAMPLES:

THE WELL SCREEN CONSISTS OF VERTICAL OVERLAPPING SLOTS CUT IN THE 160 PSI CASING WITH A CIRCULAR SAW. THE WELL BOTTOM IS CAPPED WITH A SLIP CAP (NOT GLUED). THE WELL WAS GRAVEL PACKED WITH QUARTZITE CHIPS AND SEALED AT THE TOP WITH BENTONITE.

0 - 4 TOPSOIL, BLACK  
4 - 11 CLAY, YELLOW-BROWN, SILTY, SANDY, PEBBLY (TILL)  
11 - 15 CLAY, YELLOW-GRAY, SILTY, SANDY, PEBBLY; SLIGHT GASOLINE ODOR (TILL)  
15 - 18 CLAY, YELLOW-BROWN, SILTY, SANDY, PEBBLY; LESS GASOLINE ODOR THAN INTERVAL FROM 11 TO 15 FEET (TILL)

\* \* \* \*

COUNTY: HUTCHINSON LOCATION: 097N-60W-17BDBD 7  
MAP LOCATION: 9  
LEGAL LOCATION: SE NW SE NW SEC. 17, T. 097 N., R. 60 W.  
LATITUDE: 43.1317 LONGITUDE: 97.5755  
LAND OWNER:  
PROJECT: TRIPP PETROLEUM LEAK  
DRILLING COMPANY: SDGS  
DRILLER: M. THOMPSON DRILLER'S LOG:  
GEOLOGIST: D. ILES GEOLOGIST'S LOG: X  
DATE DRILLED: 01-17-1984 DRILLING METHOD: AUGER  
GROUND SURFACE ELEVATION: 1557.00 T  
TOTAL DRILL HOLE DEPTH: 18 TEST HOLE NUMBER: A1-84-29  
WATER RIGHTS WELL: SDGS WELL NAME: A1-84-29  
OTHER WELL NAME:

BASIN: JAMES                                   AQUIFER: TILL  
MANAGEMENT UNIT:  
SCREEN TYPE: PVC, HM.                       SCREEN LENGTH:       14.0  
CASING TYPE: PVC                            CASING DIAMETER:    2.0  
CASING TOP ELEVATION:  
CASING STICK-UP:    2.00                   TOTAL CASING AND SCREEN:   20.0  
WELL MAINTENANCE DATE:  
USGS HYDROLOGICAL UNIT CODE: 10160011  
ELECTRIC LOG INFORMATION:  
  SPONTANEOUS POTENTIAL:                   SINGLE POINT RESISTIVITY:  
  NATURAL GAMMA:                                 EXTRA:  
  SAMPLES:

THE WELL SCREEN CONSISTS OF VERTICAL OVERLAPPING  
  SLOTS CUT IN THE 160 PSI CASING WITH CIRCULAR  
  SAW. THE WELL BOTTOM IS CAPPED WITH A SLIP CAP  
  (NOT GLUED). THE WELL WAS GRAVEL PACKED WITH  
  QUARTZITE CHIPS AND SEALED AT THE TOP WITH  
  BENTONITE.

  0 -     5    TOPSOIL, BLACK  
  5 -     11   CLAY, YELLOW-BROWN, SILTY, SANDY, PEBBLY  
              (TILL)  
  11 -    15   CLAY, YELLOW-GRAY, SILTY, SANDY, PEBBLY;  
              SLIGHT GASOLINE ODOR (TILL)  
  15 -    18   CLAY, YELLOW-BROWN, SILTY, SANDY, PEBBLY;  
              VARIABLE GASOLINE ODOR BUT NEVER REAL  
              STRONG (TILL)

\* \* \* \*

COUNTY: HUTCHINSON                                LOCATION: 097N-60W-17BDBD 8  
MAP LOCATION:                                     10  
LEGAL LOCATION: SE NW SE NW SEC. 17, T. 097 N., R. 60 W.  
LATITUDE: 43.1317                                LONGITUDE: 97.5755  
LAND OWNER:  
PROJECT: TRIPP PETROLEUM LEAK  
DRILLING COMPANY: SDGS  
DRILLER: M. THOMPSON                            DRILLER'S LOG:  
GEOLOGIST: D. ILES                               GEOLOGIST'S LOG: X  
DATE DRILLED: 01-17-1984                        DRILLING METHOD: AUGER  
GROUND SURFACE ELEVATION: 1557.00 T  
TOTAL DRILL HOLE DEPTH: 18                      TEST HOLE NUMBER: A1-84-30  
WATER RIGHTS WELL:                               SDGS WELL NAME: A1-84-30  
OTHER WELL NAME:  
BASIN: JAMES                                    AQUIFER: TILL  
MANAGEMENT UNIT:  
SCREEN TYPE: PVC, HM.                           SCREEN LENGTH:       14.0  
CASING TYPE: PVC                                CASING DIAMETER:    2.0

CASING TOP ELEVATION:  
CASING STICK-UP: 2.00 TOTAL CASING AND SCREEN: 20.0  
WELL MAINTENANCE DATE:  
USGS HYDROLOGICAL UNIT CODE: 10160011  
ELECTRIC LOG INFORMATION:  
SPONTANEOUS POTENTIAL: SINGLE POINT RESISTIVITY:  
NATURAL GAMMA: EXTRA:  
SAMPLES:

THE WELL SCREEN CONSISTS OF VERTICAL OVERLAPPING SLOTS CUT IN THE 160 PSI CASING WITH A CIRCULAR SAW. THE WELL BOTTOM IS CAPPED WITH A SLIP CAP (NOT GLUED). THE WELL WAS GRAVEL PACKED WITH QUARTZITE CHIPS AND SEALED AT THE TOP WITH BENTONITE.

0 -	6	TOPSOIL, BLACK
6 -	12	CLAY, YELLOW-BROWN, SILTY, SANDY, PEBBLY (TILL)
12 -	15	CLAY, YELLOW-GRAY, SILTY, SANDY, PEBBLY; SLIGHT GASOLINE ODOR (TILL)
15 -	18	CLAY, YELLOW-BROWN, SILTY, SANDY, PEBBLY (TILL)

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