

# **Waste Isolation Pilot Plant Borehole Data**



**April 1995**

Prepared for  
**United States Department of Energy  
Carlsbad Area Office**

**Westinghouse Electric Corporation  
Waste Isolation Division**

**MASTER**

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Processing and final preparation of this report was performed by the Waste Isolation Pilot Plant Management and Operating Contractor for the U.S. Department of Energy under Contract No. DE-AC04-86AL31950.

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H-7b2	105
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## EXECUTIVE SUMMARY

Data pertaining to all the surface boreholes that have been used at the WIPP site for site characterization hydrological testing and resource evaluation exist in numerous source documents. This project was initiated to develop a comprehensive data base that would include the data on all WIPP related surface boreholes from the Atomic Energy Commission, Waste Isolation Pilot Plant Energy Research and Development Administration, Department of Energy, and Hydrologic Test Borehole Programs.

The data compiled from each borehole includes: the operator, permit number, location, total depth, type of well, driller, drilling record, casing record, plugging schedule, and stratigraphic summary. There are six groups of boreholes contained in this data base, they are as follows: Commercially Drilled Potash Boreholes, Energy Department Wells, Geologic Exploration Boreholes, Hydrologic Test Boreholes, Potash Boreholes, and Subsurface Exploration Boreholes.

There were numerous references which contained borehole data. During the compilation of this data base, it was noted that in some cases the data found in one document was inconsistent with data in another document. In order to ensure consistency and accuracy in the data base, the same references were used for as many of the boreholes as possible. For example, all elevations and locations were taken from *Compilation and Comparison of Test-Hole Location Surveys in the Vicinity of the WIPP Site*. SAND 88-1065, Table 3-5. There are some sections where a data field is left blank. In this case, the information was either not applicable or was unavailable.

The attached reference list is divided into two categories: major references and minor references. The major references are the references most frequently used to obtain data for this document. Minor references were primarily single borehole reference reports.

All the data included in this document has been reviewed by an independent third party and verified as to its accuracy and completeness.

**ENERGY DEPARTMENT WELLS DATA BASE**

---

**BOREHOLE:** AEC-7  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1323

**LOCATION:** 2036.97' FNL, 2033.23' FEL  
Sec. 31, T 21 S, R 32 E

**ELEVATION:** 3657.25' (Top of Casing)  
**TOTAL DEPTH:** 4734'  
**TYPE OF WELL:** Geological Exploration  
**DRILLER:** Verna Drilling Company

**DRILLING RECORD:**      **Date Started:** 03/20/74      **Date Completed:** 04/19/80

**CASING RECORD:**

Diameter: 13 3/8  
Grade: H-40  
Wt/Ft: 48  
From: 0  
To: 40  
Cement:

Diameter: 8 5/8  
Grade: H-40  
Wt/Ft: 28  
From: 0  
To: 1016  
Cement:

**PLUGGING SCHEDULE:**

No plugging data.

**STRATIGRAPHIC SUMMARY:**      Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
AEC-7	Quaternary	
	Holocene-Eolian Sand	16.2-20.2
	Mescalero Caliche	20.2-24.2
	Triassic	
	Santa Rosa Sandstone	24.2-133.0
	Permian	
	Dewey Lake Red Beds	133.0-675.0
	Rustler Formation	675.0-1000.6
	Magenta Dolomite Member	733.5-767.0
	Culebra Dolomite Member	872.2-900.5
	Salado Formation	1000.6-3014.7
	Upper Member	1000.6-1505.1
	MB 101	1125.8
	MB 102	1158.5
	MB 103	1171.4-1186.5
	MB 104	1197.0
	MB 105	1211.5
	MB 106	1230.5
	MB 107	1269.0
	MB 108	1278.0
	MB 109	1303.8-1324.5
	MB 111	1378.0
	MB 112	1397.5
	MB 114	1450.5
	MB 116	1498.4
	McNutt Potash Zone	1505.1-1881.0
	Vaca Triste Sandstone	1505.1-1514.1
	MB 117	1578.9
	MB 118	1595.6
	MB 119	1619.8
	MB 121	1661.5
	MB 122	1668.5
	Union Anhydrite	1696.2-1705.0
	MB 123	1774.8-1781.2
	MB 124	1785.5-1795.5
	MB 126	1881.0
	Lower Member	1881.0-3104.7
	MB 128	1918.0
	MB 129	1943.9
	MB 131	2013.5
	MB 132	2039.0
	MB 133	2057.5
	MB 134	2097.0-2109.0
	MB 136	2161.0-2168.0
	MB 139	2267.5
	MB 140	2302.8-2314.2
	MB 141	2364.5
	MB 142	2400.2-2406.5
	MB 143	2453.0-2455.6
	Cowden Anhydrite	2520.0-2539.0

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>AEC-7</b>	Castile Formation	3014.7-4535.3
	Anhydrite III	3014.7-3113.0
	Halite II	3113.0-3310.0
	Anhydrite II	3310.0-3506.9
	Halite II	3506.9-3588.2
	Anhydrite II	3588.2-4055.0
	Halite I	4055.0-4182.3
	Anhydrite I	4182.3-4535.5
	Bell Canyon Formation	4535.5-4731.9 (T.D.)
	Reef Talus	4535.5-4584.7
	Lamar Limestone	4584.7-4633.3
	Ramsey Sandstone	4633.3-4678.5
	Ford Shale	4678.5-4714.9
	Olds Sandstone	4714.9-4731.9



**ENERGY DEPARTMENT WELLS DATA BASE**

**BOREHOLE:** AEC-8  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** Unkown  
  
**LOCATION:** 935' FNL, 1979' FWL  
Sec. 11, T 22 S, R 31 E  
  
**ELEVATION:** 3532' (Top of Casing)  
**TOTAL DEPTH:** 4922'  
**TYPE OF WELL:** Geological Exploration  
**DRILLER:** Sonora Drilling Company

**DRILLING RECORD:**      **Date Started:** 06/28/76      **Date Completed:** 08/05/76

**CASING RECORD:**

Diameter: 13 3/8  
Grade:  
Wt/Ft: 54.5  
From: 0  
To: 42  
Cement:

Diameter: 8 5/8  
Grade:  
Wt/Ft: 28  
From: 0  
To: 885  
Cement: 660 Cu. Ft.

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 4919  
Cement: 2481 Cu. Ft.

Note: Completed logging. Ran 7 7/8" bit in the hole and conditioned mud to run casing. Corrected total depth to 4922'. Laid down drill pipe. Ran 123 joints (4933.72') of 5 1/2" O.D., 15.50#, J-55, range 3, ST&C casing in the hole and landed at 4918.77' (4907.22' GL). A Halliburton guide shoe was on bottom with a float shoe at 4859.52' GL. Centralizers were placed at 4905' GL, 4827' GL, 800' GL and 50' GL. 38 joints (1533.25') of casing were sand blasted for better bond from 2374' to 4907' KB.

Completed running casing. Cemented annulus using Halliburton with 1500 sacks (2085 cu ft) of 50-50 Pozmix "C" with 9.7 #/sk of salt and 2% bentonite followed by 300 sacks (396 cu ft) of Class "C" cement. Displaced cement with 117 barrels of water. Casing was reciprocated during displacement. After displacing 90 barrels approximately 2 barrels of cement circulated to the surface, circulation was lost at this point. Bumped plug with 2000 psi and held. Cement in place at 0220 hours. Ran Dresser Atlas temperature log, top of cement at 880'. Ran Sperry-Sun gyroscopic multishot survey in the hole on 25' stations and 100' stations out of the hole.

All depths are measured from Kelly Bushing 11.5' above ground level.

**PLUGGING SCHEDULE:**

See Casing Record.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
AEC-8	Quaternary: Holocene-Eolian Sand	9.0-29.0
	Mescalero Caliche	29.0-35.0
	Triassic	
	Santa Rosa Sandstone	35.0-177.4
	Permian	
	Dewey Lake Red Beds	177.4-668.0
	Rustler Formation	668.0-990.0
	Magenta Dolomite Mem	727.3-749.5
	Culebra Dolomite Mem	848.3-873.3
	Salado Formation	990.0-2979.6
	Upper Member	990.0-1469.3
	MB 101	1101.0-1116.5
	MB 102	1146.7
	MB 103	1157.7-1173.7
	MB 104	1184.4
	MB 105	1197.6
	MB 106	1215.3
	MB 107	1240.5
	MB 108	1261.3
	MB 109	1286.1-1304.7
	MB 111	1351.9
	MB 112	1370.4
	MB 113	1398.7
	MB 114	1418.2
	MB 115	1451.3
	MB 116	1462.5
	McNutt Potash Zone	1469.3-1826.5
	Vaca Triste Sands	1469.3-1484.1
	MB 117	1535.4
	MB 118	1557.0
	MB 119	1580.5
	MB 120	1603.2
	MB 121	1622.0
	MB 122	1628.6
	Union Anhydrite	1648.0-1657.9
	MB 123	1733.5
	MB 124	1746.8
	MB 126	1826.5
	Lower Member	1826.5-2979.6
	MB 127	1849.5
	MB 128	1861.5
	MB 129	1885.3
	MB 130	1894.7
	MB 131	1959.6
	MB 132	1989.0
	MB 133	2005.5
	MB 134	2047.9-2060.5
	MB 135	2076.0
	MB 136	2114.0-2128.3
	MB 137	2138.5

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
AEC-8	MB 138	2187.4
	MB 139	2247.8
	MB 140	2309.1-2316.5
	MB 141	2369.1
	MB 142	2411.8-2419.6
	MB 143	2465.2-2472.7
	MB 144	2498.8-2510.9
	Cowden Anhydrite	2539.5-2561.6
	Castile Formation	2979.6-4315.0
	Anhydrite III	2979.6-3290.0
	Halite II	3290.0-3555.0
	Anhydrite II	3555.0-3695.5
	Halite I	3695.5-4038.0
	Anhydrite I	4038.0-4315.0
	Bell Canyon Formation	4315.0-4918.0 (T.D.)
	Lamar Limestone	4344.5-4374.0
	Ramsey Sand	4374.0-4436.0
	Ford Shale	4436.0-?

**ENERGY DEPARTMENT WELLS DATA BASE**

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**BOREHOLE:** ERDA-6  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** Unknown  
  
**LOCATION:** 2152' FSL, 910' FEL  
Sec. 35, T 21 S, R 31 E  
  
**ELEVATION:** 3540.2' (Top of Casing)  
**TOTAL DEPTH:** 2775'  
**TYPE OF WELL:** Geologic Exploration  
**DRILLER:** Boyles Bros. Drilling Company: 06/11/75 to 08/15/75 - Pan AM L

**DRILLING RECORD:**      **Date Started:** 06/13/75      **Date Completed:** 09/23/75

**CASING RECORD:**

Diameter: 13 3/8  
Grade:  
Wt/Ft: 54.5  
From: 0  
To: 30  
Cement: Ready Mix

Diameter: 8 5/8  
Grade: K-55  
Wt/Ft: 24  
From: 0  
To: 880  
Cement: 575 SX.

Note: Plugged back 2773' to 2560' with 225 cement. Hole filled with brine.

**PLUGGING SCHEDULE:**

See Casing Record.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
ERDA-6	Quaternary	
	Holocene-Eolian Sand	0-9
	Mescalero Caliche	9-17
	Triassic	
	Santa Rosa Sandstone	17-72
	Permian	
	Dewey Lake Red Beds	72-538
	Rustler Formation	538-811
	Dissolution Residue	570-581
	Magenta Dolomite Member	598-623
	Dissolution Residue	696-707
	Culebra Dolomite Member	713-739
	Dissolution Residue	742-762
	Salado Formation	811-2396.5
	Upper Unit	811-1276.6
	MB 100	NR
	MB 101	923.5-929.9
	MB 102	956.8-958.2
	MB 103	970.3-984.3
	MB 104	992.1-992.4
	MB 105	NR
	MB 106	NR
	MB 107	1060.0-1060.9
	MB 108	1069.1-1069.9
	MB 109	1090.9-1113.5
	MB 110	NP
	MB 111	1161.5-1161.8
	MB 112	1178.9-1180.2
	MB 113	NP
	MB 114	1224.9-1226.9
	MB 115	1256.1-1257.2
	MB 116	1268.7-1271.4
	McNutt Potash Zone	1276.6-1612.9
	Vaca Triste Sandstone	1276.6-1287.3
	11th Ore Zone	1324.7-1329.8
	MB 117	1340.7-1342.7
		1346-1349.0
	MB 118	1359.0-1366.2
	MB 119	1378.4-1379.4
	10th Ore Zone	1386.1-1395.5
	MB 120	1401.0-1402.3
	9th Ore Zone	1403.2-1410.3
	MB 121	1413.3-1415.5
	MB 122	1422.3-1424.3
	8th Ore Zone	1424.9-1437.0
	Union Anhydrite	1444.6-1453.8
	7th Ore Zone	1464.0-1468.5
	6th Ore Zone	1479.7-1482.2
	5th Ore Zone	1487.8-1494.9
	MB 123	1517.7-1524.9

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
ERDA-6	MB 124	1529.4-1537.5
	4th Ore Zone	1541.9-1549.1
		1549.7-1553.0
	3rd Ore Zone	1555.5-1567.2
	2nd Ore Zone	1571.0-1574.3
	MB 125	NP
	1st Ore Zone	1587.0-1603.3
	MB 126	NP
	Lower Member	1612.9-2396.5
	MB 127	1635.0-1635.7
	MB 128	1647.7-1648.5
	MB 129	1670.0-1671.5
	MB 130	NP
	MB 131	1743.0-1743.7
	MB 132	1770.6-1771.4
	MB 133	1785.6-1789.2
	MB 134	1833.2-1843.4
	MB 135	1860.4-1861.5
	MB 136	1900.5-1910.5
	MB 137	NP
	MB 138	1967.5-1967.7
	MB 139	2019.5-2022.4
	MB 140	2060.4-2075.6
	MB 141	2124.5-2126.6
	MB 142	2163.8-2169.5
	MB 143	2212.7-2215.6
	MB 144	2237.0-2237.7
	Cowden Anhydrite	2269.5-2291.0
	Castile Formation	2400.5-2775.0
	Halite II	2400.5-2555.1
	Anhydrite II	2555.1-2732.5 (Fault or Rupture Zone)
	Halite I	2732.5-2775.0
	Cowden Anhydrite	2540.0-2653.0
	Castile Formation	2836.0-2889.0

**ENERGY DEPARTMENT WELLS DATA BASE**

**BOREHOLE:** ERDA-9  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** Unknown

**LOCATION:** 267.17' FSL, 176.74' FEL  
Sec. 20, T 22 S, R 31 E

**ELEVATION:** 3410.10' (Top of Casing)  
**TOTAL DEPTH:** 2886'  
**TYPE OF WELL:** Geologic Exploration  
**DRILLER:** Sonora Drilling Company

**DRILLING RECORD:**      **Date Started:** 04/28/76      **Date Completed:** 06/26/76

**CASING RECORD:**

Diameter: 16  
Grade:  
Wt/Ft:  
From: 0  
To: 40  
Cement: 95 Cu. Ft.

Diameter: 10 3/4  
Grade: J-55  
Wt/Ft: 40.5  
From: 0  
To: 1045  
Cement: 1159 Cu. Ft.

Diameter: 7  
Grade: J-55  
Wt/Ft: 23  
From: 0  
To: 2883  
Cement: Mud Pack

Note: Ran Dresser Atlas caliper log. Ran 79 joints (2889.66') of 7" O.D., 23# casing with a Dowell swirl type shoe on bottom and a Dowell orifice fill collar on top of the bottom joint. Set casing at 2882.66' with centralizers at 2868', 2520', and 1030'. Rigged up Dowell and pumped in 140 barrels of Baroid casing pack mud. Cemented annulus with 10 barrels of water, 12 barrels of chemical wash, 12 barrels of oil base slurry ahead of 122 cu. ft. (115 sacks) of Class "H" cement + 3% calcium chloride. Seated plug with 1000 psi, plug holding. Cement in place at 1445 hours.

All depths are measured from Kelly Bushing 11.5' above ground level.

**PLUGGING SCHEDULE:**

See Casing Record.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
ERDA-9	Kelly Bushing (KB) to Land Surface (LS)	0-12.0
	Holocene Deposits	12.0-22.0
	Pleistocene Rocks	
	Mescalero Caliche	22.0-27.0
	Gatuna Formation	27.0-54.0
	Triassic	
	Santa Rosa Sandstone	54.0-63.0
	Permian	
	Dewey Lake Red Beds	63.0-550.0
	Ruslter Formation	550.0-860.0
	Dissolution Residue	580.0-592.0
	Magenta Dolomite Member	608.0-632.0
	Dissolution Residue	691.0-710.0
	Culebra Dolomite Member	716.0-739.0
	Dissolution Residue	742.0-748.0
	Salado Formation	860.0-2836.0
	Upper Member	860.0-1362.0
	MB 100	939.0
	MB 101	984.0
	MB 102	1026.0
	MB 103	1040.0-1050.0
	MB 104	1061.0
	MB 105	1075.0
	MB 106	1093.0-1094.0
	MB 107	1132.0
	MB 108	1142.0
	MB 109	1165.0-1188.0
	MB 110	NP
	MB 111	1238.0
	MB 112	1256.0-1258.0
	MB 113	1282.0-1284.0
	MB 114	1306.0
	MB 115	1340.0-1344.0
	MB 116	1354.0-1356.0
	McNutt Potash Zone	1362.0-1742.0
	Vaca Triste Sands	1365.0-1367.0
	11th Ore Zone	1420.0-1422.0
	MB 117	1431.0-1433.0
	MB 118	1455.0-1463.0
	MB 119	1482.0
	10th Ore Zone	1487.0-1493.0
	MB 120	1501.0-1502.0
	9th Ore Zone	1507.0-1512.0
	MB 121	1515.0-1517.0
	MB 122	1524.0
	8th Ore Zone	1531.0-1542.0
	Union Anhydrite	1549.0-1557.0
	7th Ore Zone	1572.0-1576.0
	6th Ore Zone	1590.0-1593.0
	5th Ore Zone	1597.0-1603.0



## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
ERDA-9	MB 123	1630.0-1637.0
	MB 124	1645.0-1653.0
	4th Ore Zone	1659.0-1669.0
	3rd Ore Zone	1676.0-1688.0
	2nd Ore Zone	1696.0-1698.0
	MB 125	NP
	1st Ore Zone	1712.0-1723.0
	MB 126	1742.0
	Lower Member	1742.0-2836.0
	MB 127	1768.0-1770.0
	MB 128	1778.0-1781.0
	MB 129	1803.0-1805.0
	MB 130	1815.0
	MB 131	1884.0
	MB 132	1914.0-1915.0
	MB 133	1933.0-1935.0
	MB 134	1976.0-1989.0
	MB 135	2006.0
	MB 136	2043.0-2058.0
	MB 137	2075.0
	MB 138	2120.0-2121.0
	MB 139	2177.0-2180.0
	MB 140	2241.0-2251.0
	MB 141	2320.0-2330.0
	MB 142	2377.0-2391.0
	MB 143	2450.0-2456.0
	MB 144	2493.0-2506.0
	Cowden Anhydrite	2540.0-2653.0
	Castile Formation	2836.0-2889.0

**ENERGY DEPARTMENT WELLS DATA BASE**

**BOREHOLE:** ERDA-10  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** Unkown  
  
**LOCATION:** 200' FNL, 2327' FEL  
Sec. 34, T 23 S, R 30 E  
  
**ELEVATION:** 3371.2' (Top of Casing)  
**TOTAL DEPTH:** 4418.5'  
**TYPE OF WELL:** Geologic Exploration  
**DRILLER:** Corel Drilling Company

**DRILLING RECORD:**      **Date Started:** 08/18/77      **Date Completed:** 10/14/77

**CASING RECORD:**

Diameter: 13 3/8  
Grade: H-40  
Wt/Ft: 48  
From: 0  
To: 50  
Cement: 81 Cu. Ft.

Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 805  
Cement: 554 Cu. Ft.

Note: Hole plugged to surface.  
All depths are measured from Kelly Bushing 13' above ground level.

**PLUGGING SCHEDULE:**

10/01/77 - Made trip with 7 7/8" bit and conditioned hole. Ran 2 3/8" O.D. tubing in the hole and plugged back hole using Dowell with 10 barrels of water ahead of 48 barrels of mud wash followed by 414 cu. ft. of class "C" cement with 2% calcium chloride. Displace cement with 12.5 barrels of water. Cement in place at 1300 hours. Pulled tubing and waited on cement.

10/03/77 - Made trip with 7 7/8" bit and tagged cement at 3556', conditioned hole. Made up 7 13/16" core bit and cut core #32 from 3556' to 3595', recovered 10' of cement. Cut core #33 from 3595' to 3623', recovered 20' of cement. Cut core #34 from 3623' to 3630'.

10/04/77 - Completed core #34 from 3630' to 3673', recovered 27' of cement. Ran 2 7/8" O.D. tubing in the hole to 3673'. Cemented plug #2 using Dowell with 10 barrels of water ahead of 84 barrels of mud flush followed by 10 barrels of water ahead of 1040 cu. ft. of 70% class "C" cement and 30% Litepoz. Cement in place at 1140 hours. Pulled tubing to 2300' and circulated hole. Waited on cement. Laid down drill pipe.

10/05/77 - Waited on cement to 0900 hours. Tagged top of plug #2 at 2335' with tubing. Cemented plug #3 with 10 barrels of water, 60 barrels of mud flush and 10 barrels of water, ahead of 1039 cu. ft. of cement slurry. Cement in place at 1420 hours. Pulled tubing to 803' and circulated out mud flush and cement. Waited on cement.

10/06/77 - Tagged top of plug #3 at 827'. Cemented plug #4 to surface with 10 barrels of water, 1000 gallons of mud flush and 10 barrels of water ahead of 417 cu. ft. of cement slurry. Cement in place at 0050 hours. Rigged down government furnished equipment and released rig at 1600 hours.

10/14/77 - Cement had dropped to 11.5' inside the 9 5/8" O.D. casing. Cemented to surface with 6 sacks of cement. Hole plugged

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
ERDA-10	Quaternary	
	Holocene-Eolian Sand	
	Mescalero Caliche	13.0-17.0
	Triassic	
	Gatuna Formation	17.0-164.0
	Permian	
	Dewey Lake Red Beds	164.0-378.0
	Rustler Formation	378.0-640.0
	Magenta Dolomite Member	378.0-379.0
	Culebra Dolomite Member	489.0-517.0
	Salado Formation	640.0-2350.0
	Upper Member	640.0-1078.0
	MB 101	696.0
	MB 102	743.0
	MB 103	775.0-783.5
	MB 104	794.5
	MB 105	807.0
	MB 106	817.0
	MB 107	829.0
	MB 108	852.5
	MB 109	879.5-904.5
	MB 111	960.0
	MB 112	978.0
	MB 113	1018.0
	MB 114	1035.0
	MB 115	1068.0
	MB 116	1076.0
	McNutt Postash Zone	1087.0-1521.5
	Vaca Triste Sands	1087.0-1092.5
	MB 117	1162.0
	MB 118	1189.0
	MB 119	1225.0
	MB 121	1264.0
	MB 122	1279.5
	Union Anhydrite	1310.0-1330.0
	MB 123	1380.5-1387.0
	MB 124	1399.5-1407.5
	MB 125	1482.5
	MB 126	1521.5
	Lower Member	1521.5-2350.0
	MB 128	1556.0
	MB 129	1590.0
	MB 130	1604.0
	MB 131	1674.5
	MB 132	1704.5
	MB 133	1722.0
	MB 134	1771.5-1781.0
	MB 135	1807.0
	MB 136	1855.0-1864.5
	MB 138	1930.0

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
ERDA-10	MB 139	1993.0
	MB 140	2053.0-2062.5
	MB 141	2150.9-2155.4
	MB 142	2220.6-2237.4
	MB 143	2302.6-2313.6
	Castile Formation	2350.0-3842.9
	Anhydrite IV	2350.0-2398.2
	Cowden Anhydrite	2398.2-2424.0
	Anhydrite III	2424.0-3097.2
	Halite II	3097.2-3283.7
	Anhydrite II	3283.7-3377.4
	Halite I	3377.4-3616.4
	Anhydrite I	3616.4-3842.9
	Bell Canyon Formation	3842.9-4430.0 (T.D.)
	Lamar Limestone	3842.9-3870.0
	Ramsey Sandstone	3870.0-3918.0
	Ford Shale	3918.0-3928.0
	Old Sandstone	3928.0-3956.0

**ENERGY DEPARTMENT WELLS DATA BASE**

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**BOREHOLE:** BABY-1  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:**

**LOCATION:** 1989.5' FNL, 2017.1' FEL  
Sec 5, T 23 S, R 31 E

**ELEVATION:** 3328.38' (Top of Casing)  
**TOTAL DEPTH:** 4298.6'  
**TYPE OF WELL:** Oil and Gas Well (Exploratory)  
**DRILLER:** Michel P. Grace - 1974 and Salazar Bros.- 1983

**DRILLING RECORD:**      **Date Started:** 08/12/83      **Date Completed:** 02/08/75  
  
Deepened to 4298.6'  
Date Started: 17/18/83  
Date Completed: 08/19/83

**CASING RECORD:**

13 3/8" O.D. casing set in cement to surface 650'  
9 7/8" O.D. 650 - 4159'  
7 27/32" O.D. 4159 - 4298.6'

**PLUGGING SCHEDULE:**

Ran 20 joints of 13 3/8 71# casing set at 650'. Cemented with 275 sacks of Trin. Lt. Wt. and 125 sacks Cl. C. and 300# CaCl and 69# celloflake.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
BABY-1	Quaternary	15.5
	Triassic	
	Santa Rosa Sandstone	15.5-142.8
	Permian	
	Dewey Lake Red Beds	142.8-362.9
	Rustler Formation	362.9-653.0
	Magenta Dolomite Member	375.0-414.1
	Culebra Dolomite Member	469.0-487.2
	Salado Formation	653.0-2703.5
	Upper Member	781.3
	MB 101	818.0
	MB 102	845.0-851.0
	MB 103	884.2
	MB 105	922.1
	MB 106	946.8
	MB 107	962.1
	MB 108	977.0-993.9
	MB 109	1036.9
	MB 111	1065.8
	MB 112	1097.0
	MB 113	1117.1
	MB 114	1157.1
	MB 115	1169.8
	MB 116	1182.0-1585.1
	McNutt Potash Zone	1251.0
	MB 117	1277.6
	MB 118	1299.9
	MB 119	1328.9
	MB 120	1346.1
	MB 121	1353.2
	MB 122	1381.8-1395.2
	Union Anhydrite	1454.5-1463.1
	MB 123	1470.0-1481.0
	MB 124	1585.1
	MB 126	1585.1-2703.5
	Lower Member	1610.2
	MB 127	1621.8
	MB 128	1650.1
	MB 129	1663.2
	MB 130	1732.9
	MB 131	1763.7
	MB 132	1784.2
	MB 133	1837.7-1848.9
	MB 134	1871.9
	MB 135	1871.9
	MB 136	1905.2-1912.0
	MB 137	1930.5
	MB 138	1990.4
	MB 139	2040.7
	MB 140	2104.0-2110.6

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
BABY-1	MB 141	2188.8-2196.9
	MB 142	2239.8-2259.0
	MB 143	2314.1-2321.0
	MB 144	2356.0-2370.0
	Cowden Anhydrite	2407.7-2434.7
	Castile Formation	2703.5-4045.0
	Anhydrite III	2703.5-3154.8
	Halite II	3154.8-3373.1
	Anhydrite II	3373.1-3480.0
	Halite I	3480.0-3810.0
	Anhydrite I	3810.0-4045.0
	Bell Canyon Formation	4045.0-T.D.
	Lamar Limestone	4045.0-4086.0
	Ramsey Sandstone	4086.0-4132.0
	Ford Shale	4132.0-4140.0
	Olds Sandstone	4140.0-4171.0
	Hays Sandstone	4171.0-4298.6

**ENERGY DEPARTMENT WELLS DATA BASE**

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**BOREHOLE:** D-268  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unkown

**LOCATION:** 720.4 FSL, 762.7 FEL, Sec.  
35, T 22 S, R 30 E

**ELEVATION:** 3280.70 (Top of Casing)  
**TOTAL DEPTH:** 1411'  
**TYPE OF WELL:** Old Potash Drillhole  
**DRILLER:** Pennsylvania Drilling Co.

**DRILLING RECORD:**      **Date Started:** 11/15/89      **Date Completed:**

**CASING RECORD:**

Diameter: 4 1/2  
Grade:  
Wt/Ft:  
From: 0  
To: 528'  
Cement: Cement in place

**PLUGGING SCHEDULE:**

From: 1411'  
To: 528'  
Int:  
Material: Concrete Plug

**STRATIGRAPHIC SUMMARY:** Attached



## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
D-268	Quaternary	
	Holocene-Eolian Sand	0-15.0
	Mescalero Caliche	
	Triassic	
	Santa Rosa Sandstone	15.0-30.0
	Permian	
	Dewey Lake Red Beds	30.0-187.0
	Rustler Formation	187.0-494.0
	Megenta Dolomite Member	255.0-275.0
	Culebra Dolomite Member	369.0-392.0
	Salado Formation	469.0
	Upper Member	
	MB 101	
	MB 102	
	MB 103	
	MB 104	
	MB 105	
	MB 106	
	MB 107	
	MB 108	
	MB 109	
	MB 111	
	MB 112	
	MB 114	
	MB 116	
	McNutt Potash Zone	
	Vaca Triste Sandstone	
	MB 117	
	MB 118	
	MB 119	
	MB 121	
	MB 122	
	Union Anhydrite	
	MB 123	
	MB 124	
	MB 126	
	Lower Member	
	MB 128	
	MB 129	
	MB 131	
	MB 132	1411.0

**ENERGY DEPARTMENT WELLS DATA BASE**

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**BOREHOLE:** DOE-1  
**OPERATOR:** Westinghouse  
**PERMIT NO.:** Unknown

**LOCATION:** 182.4' FSL, 607.8' FEL  
Sec. 28, T 22 S, R 31 E

**ELEVATION:** 3465.22' (Top of Casing)  
**TOTAL DEPTH:** 4057.3'  
**TYPE OF WELL:** Geologic Exploration/Hydrologic Test Hole  
**DRILLER:** Salazar Bros. Drilling Co.

**DRILLING RECORD:**      **Date Started:** 07/14/82      **Date Completed:** 07/28/82

**CASING RECORD:**  
Diameter: 10 3/4 O.D.  
Grade:  
Wt/Ft:  
From: 0  
To: 41  
Cement: Set and cemented

Diameter: 10 3/4 O.D.  
Grade: J-55  
Wt/Ft: 40.5  
From: 49  
To: 1126.2  
Cement:

Diameter: 7 7/8  
Grade:  
Wt/Ft:  
From: 1126.2  
To: 4057  
Cement: Uncased

**PLUGGING SCHEDULE:**  
No plugging data.

**STRATIGRAPHIC SUMMARY:**      Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
DOE-1	Quaternary	
	Eolian Sand	Not Described
	Gatuna Formation	Not Described
	Triassic	
	Santa Rosa Sandstone	46.0-133.0
	Permian	
	Dewey Lake Red Beds	133.0-667.5
	Rustler Formation	667.5-976.5
	Magenta Dolomite Member	722.0-745.0
	Culebra Dolomite Member	828.6-850.5
	Salado Formation	976.5-2936.5
	Upper Member	976.5-1486.0
	MB 101	1102.0
	MB 102	1138.5
	MB 103	1159.0-1169.0
	MB 105	1199.0
	MB 106	1216.0
	MB 107	1254.0
	MB 108	1263.0
	MB 109	1286.0-1309.5
	MB 111	1361.3
	MB 112	1379.8
	MB 113	1406.9
	MB 114	1429.3
	MB 115	1465.8
	MB 116	1477.6
	McNutt Potash Zone	1486.0-1880.3
	Vaca Triste Sandstone	1486.0-1489.8
	MB 117	1557.2
	MB 118	1582.6
	MB 119	1608.0
	MB 120	1632.0
	MB 121	1646.5
	MB 122	1656.0
	Union Anhydrite	1681.4-1694.0
	MB 123	1762.0-1769.9
	MB 124	1773.0-1783.8
	MB 126	1880.3
	Lower Member	1880.3-2936.5
	MB 127	1907.4
	MB 128	1919.7
	MB 129	1944.3
	MB 130	1956.7
	MB 131	2025.8
	MB 132	2056.6
	MB 133	2076.0
	MB 134	2117.0-2130.0
	MB 135	2149.4
	MB 136	2192.1-2197.1
	MB 137	2209.2

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
DOE-1	MB 138	2264.0
	MB 139	2323.7
	MB 140	2374.5-2389.0
	MB 141	2457.0
	MB 142	2497.0-2512.0
	MB 143	2563.5-2570.5
	MB 144	2606.0-2621.5
	Cowden Anhydrite	2647.8-2677.0
	Castile Formation	2936.5 (T.D.)
	Anhydrite III	2936.5-3374.8
	Halite II	3374.8-3600.0
	Anhydrite II	3600.0-3708.3
	Halite I	3708.3-4032.3
	Anhydrite I	4032.3-(T.D.)

**ENERGY DEPARTMENT WELLS DATA BASE**

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**BOREHOLE:** DOE-2  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** 0.08.1467(State Engineer's Office)

**LOCATION:** 704.07' FSL, 128.19' FEL  
Sec. 8, T 22 S, R 31 E

**ELEVATION:** 3419.09' (Top of Casing)  
**TOTAL DEPTH:** 4325'  
**TYPE OF WELL:** Geologic Exploration/Hydrologic Test Hole  
**DRILLER:** Unknown

**DRILLING RECORD:**      **Date Started:** 09/08/84      **Date Completed:** 09/18/84

**CASING RECORD:**

Diameter: 9.625

Grade: J-55

Wt/Ft: 36

From: 0

To: 1009

Cement:

Diameter: 13 3/8 O.D.

Grade: H-40

Wt/Ft: 48#

From: 0

To: 39

Cement: Cemented with 81 Cu. Ft.

**PLUGGING SCHEDULE:**

No plugging data.

**STRATIGRAPHIC SUMMARY:**      Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
DOE-2	Quaternary	
	Holocene-Dune Sand	0-8
	Pleistocene-Mescalero Caliche	8-13
	Triassic	
	Santa Rosa Sandstone	13-133.3
	Permian	
	Dewey Lake Red Beds	133.3-639.1
	Rustler Formation	639.1-698.6
	Forty-Niner Member	698.6-722.4
	Magenta Dolomite Member	722.4-823.7
	Tamarisk Member	823.7-846.0
	Culebra Dolomite Member	846.0-960.9
	Unnamed Lower Member	
	Salado Formation	960.9-3082.8
	Upper Member	960.9-1448.7
	MB 101	1080.3-1084.2
	MB 102	1116.6-1117.7
	MB 103	1130.4-1143.5
	MB 104	1154.7-1155.1
	MB 105	1170.8-1171.8
	MB 106	Not Present
	MB 107	1228.0-1228.4
	MB 108	1237.5-1238.1
	MB 109	1260.0-1283.5
	MB 110	Not Present
	MB 111	1330.8-1331.0
	MB 112	1347.0-1349.2
	MB 113	1372.4-1372.9
	MB 114	1394.3-1394.8
	MB 115	1427.7-1430.6
	MB 116	1439.3-1441.4
	McNutt Potash Zone	1448.7-1827.4
	Vaca Triste Sandstone	1448.7-1456.1
	MB 117	1510.0-1511.9
	MB 118	1533.6-1534.7
	MB 119	1556.8-1557.9
	10th Ore Zone	1574.0-1580.0
	MB 120	1581.4-1581.8
	9th Ore Zone	1580-1584(EST.)
	MB 121	1598.5-1599.8
	MB 122	1606.6-1607.5
	8th Ore Zone	1611.1-1619.3
	Union Anhydrite	1630.1-1637.9
	MB 123	1716.5-1721.9
	MB 124	1728.8-1738.4
	4th Ore Zone	1746.0-1748.5
	3rd Ore Zone	1766-1774(EST.)
	2nd Ore Zone	1780-1782.5(EST.)
	MB 125	Not Present
	MB 126	1825.9-1827.4

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
DOE-2	Lower Member	1827.4-3082.8
	MB 127	1852.7-1853.8
	MB 128	1864.5-1865.5
	MB 129	1889.9-1891.9
	MB 130	1901.8-1902.0
	MB 131	1971.2-1971.7
	MB 132	1999.7-2001.2
	MB 133	2018.8-2021.7
	MB 134	2069.3-2081.0
	MB 135	2099.8-2100.5
	MB 136	2144.9-2157.3
	MB 137	Not Present
	MB 138	2203.1
	MB 139	2303.3-2306.3
	MB 140	2372.1-2388.0
	MB 141	2450.1-2454.5
	MB 142	2503.6-2517.9
	MB 143	2566.4-2571.6
	MB 144	2603.6-2615.7
	Cowden Anhydrite	2644.5-2669.5
	Castile Formation	3082.8-4071.4
	Anhydrite III	3082.8-3801.1
	Halite II	Not Present
	Anhydrite II	?
	Halite I	3801.1-3809.2
	Anhydrite I	3809.2-4071.4
	Delaware Mountain Group	
	Bell Canyon Formation	4071.4-4325+
	Lamar Limestone Member	4071.4-4103.4
	Ramsey Sand	4103.4-4174.0
	Ford Shale	4174.0-4182.8
	Olds Sand	4182.8-4218.2(?)
	Hays Sand	4218.2(?) - 4248+

**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** WIPP-11  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.08.994 (State Engineer's Office)

**LOCATION:** 711.80' FNL, 294.08' FWL  
Sec. 9, T 22 S, R 31 E

**ELEVATION:** 3426.07'  
**TOTAL DEPTH:** 3580'  
**TYPE OF WELL:** Geologic Exploration  
**DRILLER:** Verna Drilling Compa

**DRILLING RECORD:** **Date Started:** 02/06/78 **Date Completed:** 03/14/78

**CASING RECORD:** Diameter: 13 3/8  
Grade: H-40  
Wt/Ft: 48  
From: 0  
To: 40  
Cement: 81 Cu. Ft.

Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 985  
Cement: 656 Cu. Ft.

Note: Hole loaded with brine based mud, hole temporarily capped pending further testing and/or plugging, all depths are measured from Kelly Bushing 13 ft. above ground level.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached



**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>WIPP-11</b>	MB 136-T	1978.5
	MB 136-B	1978.5-1986.0
	MB 138-T	1986-2025.0
	MB 138-B	2025-2027
	Anhydrite A	Not Encountered
	Anhydrite B	Not Encountered
	MB 139-T	2061.0
	MB 139-B	2061-2064
	MB 140-T	2064-2092
	MB 140-B	2092-2105

# GEOLOGIC EXPLORATION BOREHOLE DATA BASE

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**BOREHOLE:** WIPP-12  
**OPERATOR:** Westinghouse  
**PERMIT NO.:** Unknown

**LOCATION:** 149.4' FSL, 80.4' FEL  
Sec. 17, T 22 S, R 31 E

**ELEVATION:** 3472.06 (Top of Casing)  
**TOTAL DEPTH:** 3927.5'  
**TYPE OF WELL:** Geologic Exploration  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 11/17/81 **Date Completed:** 12/07/78

**CASING RECORD:** Diameter: 9 5/8  
Grade: H-40  
Wt/Ft: 32.3  
From: 39  
To: 1001.8  
Cement: 475 Cu. Ft.

Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 39  
Cement: 475 Cu. Ft.

Diameter: 9 5/8  
Grade: H-40  
Wt/Ft: 32  
From: 39  
To: 1013  
Cement: 475 Cu. Ft.

Note: Hole loaded with brine based mud pending further tests. All depths are measured from Kelly Bushing 12.2 ft. above ground level.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
WIPP-12	Quaternary Deposits	
	Sand (Holocene-eolian)	0-16.2
	Mescalero Caliche	16.2-19.2
	Gatuna Formation	19.2-28.8
	Triassic Rocks	
	Santa Rosa Sandstone	28.8-167.0
	Permian Rocks	
	Dewey Lake Red Beds	167.0-640.0
	Rustler Formation	640.0-966.0
	Magenta Dolomite Member	703.9-727.0
	Culebra Dolomite Member	822.0-846.8
	Salado Formation	966.0-2737.5
	Upper Member	966.0-1444.0
	MB 101	1084.5
	MB 102	1116.0
	MB 103	1130.0-1141.0
	MB 104	1150.0
	MB 105	1167.6
	MB 106	1183.5
	MB 107	1223.5
	MB 108	1232.5
	MB 109	1254.0-1278.0
	MB 111	1324.0
	MB 112	1338.0-1342.0
	MB 113	1367.0
	MB 114	1389.0
	MB 115	1424.5
	MB 116	1436.0
	McNutt Member	1444.0-1798.0
	Vaca Triste Sandstone Member	1444.0-1447.0
	MB 117	1507.5
	MB 118	1531.0
	MB 119	1552.0-1556.5
	MB 120	1575.0
	MB 121	1588.0
	MB 122	1596.0
	Union Anhydrite	1617.0-1625.0
	MB 123	1695.0-1700.8
	MB 124	1708.0-1715.4
	MB 126	1798.0
	Lower Member	1798.0-2737.5
	MB 127	1825.0
	MB 128	1834.0
	MB 129	1856.0
	MB 130	1867.0
	MB 131	1928.0
	MB 132	1957.5

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
WIPP-12	MB 133	1976.0
	MB 134	2015.0-2025.0
	MB 135	2040.0
	MB 136	2071.6-2083.1
	MB 138	2135.1
	MB 139	2184.9
	MB 140	2226.1-2238.1
	MB 141	2290.0-2296.0
	MB 142	2332.0-2344.0
	MB 143	2381.5-2387.6
	MB 144	2413.5-2423.9
	Cowden Anhydrite	2445.5-2471.0
	Castile Formation	2337.5-T.D.
	DEEPENED PORTION OF WIPP-12	
	Castile Formation	2776.0-T.D.
	Anhydrite III Member	2776.0-3053.9
	Halite II Member	3053.9-3281.8
	Anhydrite II Member	3281.8-3391.0
	Halite I Member	3391.0-3901.6
	Anhydrite I Member	3901.6-T.D.

**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** WIPP-13  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.09.1182 (State Engineer's Office)

**LOCATION:** 2565.68' FSL, 1730.59' FWL  
Sec. 17, T 22 S, R 31 E

**ELEVATION:** 2565.68' (Top of Casing)  
**TOTAL DEPTH:** 3856'  
**TYPE OF WELL:** Geologic Exploration  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 07/26/78 **Date Completed:** 10/05/79 (Recompletion)

**CASING RECORD:** Diameter: 13 3/8  
Grade:  
Wt/Ft: 48  
From: 0  
To: 35.5  
Cement: 108 Cu. Ft.

Diameter: 9 5/8  
Grade:  
Wt/Ft: 36  
From: 0  
To: 1023  
Cement: 665 Cu. Ft.

Note: Hole loaded with brine based mud pending further test and/or plugging. All depths are measured from Kelly Bushing 12.2 ft. above ground except cores between 570 and 878 ft. and Schlumberger logs which were measured from ground level.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
WIPP-13	Quaternary Deposits	0-13
	Triassic Rocks	
	Santa Rosa Sandstone	13-66
	Permian Rocks	
	Dewey Lake Red Beds	66-517
	Rustler Formation	517-846
	Dissolution Residue	543-550
	Magenta Dolomite Member	565-583
	Dissolution Residue	679-686
	Culebra Dolomite Member	703-726
	Dissolution Residue	730-735
	Top of Highest Salt in Section	745
	Salado Formation	846-1025
	Upper Member	846-1025
	MB 101	967
	MB 102	1003
	MB 103	1018
	DEEPENED PORTION OF WIPP-13 (Distance below K.B.)	
	Permian Rocks	
	Salado Formation	858.0-2971.6
	Upper Member	858.0-1356.7
	MB 103	1030.0-1042.3
	MB 104	1069.8
	MB 105	1091.0
	MB 106	1111.0
	MB 107	1128.0
	MB 108	1136.1
	MB 109	1161.0-1185.0
	MB 111	1232.8
	MB 112	1250.0
	MB 113	1277.9
	MB 114	1300.9
	MB 115	1338.3
	MB 116	1350.0
	McNutt Member	1356.7-1730.4
	Vaca Triste Sandstone Member	1356.7-1359.0
	MB 117	1426.5
	MB 118	1451.5
	MB 119	1478.2
	MB 120	1497.0
	MB 121	1513.8
	MB 122	1522.0
	Union Anhydrite	1542.0-1550.0
	MB 123	1628.0
	MB 124	1644.7
	MB 126	1730.4
	Lower Member	1730.4-2971.6

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
WIPP-13	MB 127	1757.8
	MB 128	1770.0
	MB 129	1794.0
	MB 130	1804.5
	MB 131	1873.6
	MB 132	1902.0
	MB 133	1924.0
	MB 134	1968.9-1980.6
	MB 135	1996.8
	MB 136	2033.0-2048.0
	MB 137	2063.0
	MB 138	2110.2
	MB 139	2168.3
	MB 140	2221.0-2232.9
	MB 141	2294.6
	MB 142	2341.5-2355.0
	MB 143	2409.0-2417.0
	MB 144	2460.4
	Cowden Anhydrite	2493.9-2521.6
	Castile Formation	2971.6-3861.6+ (T.D.)
	Anhydrite III	2971.6-3518.7
	Halite II	3518.7-3638.0
	Anhydrite II	3638.0-3727.5
	Halite I	3727.5-3821.0
	Anhydrite I	3821.0-3861.6+ (T.D.)

# GEOLOGIC EXPLORATION BOREHOLE DATA BASE

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**BOREHOLE:** WIPP-14  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.08.1458 (State Engineer's Office)

**LOCATION:** 98.57' FSL, 2112.08' FEL  
Sec. 9, T 22 S, R 31 E

**ELEVATION:** 3429' (G.L.)  
**TOTAL DEPTH:** 1000'  
**TYPE OF WELL:** Geologic Exploration  
**DRILLER:** Boyles Brothers Drilling

**DRILLING RECORD:**      **Date Started:** 05/02/81      **Date Completed:** 06/08/81

**CASING RECORD:**      Diameter: 7  
Grade: J-55  
Wt/Ft: 23  
From: 0  
To: 111  
Cement:

Note: Hole loaded with brine based mud and temporarily abandoned pending further tests and/or plugging.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached



**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>WIPP-14</b>	Quaternary Rocks	
	Sand (Holocene-eolian)	0-15.4
	Triassic Rocks	
	Santa Rosa Sandstone	15.4-141.0
	Permian Rocks	
	Dewey Lake Red Beds	141.0-638.7
	Rustler Formation	638.7-951
	Magenta Dolomite Member	706.5-730.0
	Culebra Dolomite Member	817.2-836.2
	Salado Formation (Upper Member)	951.6

**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** WIPP-15  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.13.00 (State Engineer's Office)

**LOCATION:** 2426' FNL, 1973' FWL  
Sec. 18, T 23 S, R 35 E

**ELEVATION:** 3269.34' (G.L.I.)  
**TOTAL DEPTH:** 810'  
**TYPE OF WELL:** Geologic Exploration  
**DRILLER:** Boyles Brothers Drilling

**DRILLING RECORD:** **Date Started:** 03/08/78 **Date Completed:** 04/04/78

**CASING RECORD:** Diameter: 7  
Grade: J-55  
Wt/Ft: 20  
From: 0  
To: 13  
Cement:

Diameter: 6 1/8  
Grade: HW  
Wt/Ft: 11.3  
From: 13  
To: 592  
Cement:

Diameter: 4  
Grade: Core  
Wt/Ft:  
From: 592  
To: 810  
Cement:

Diameter: 4 1/2  
Grade: HW  
Wt/Ft: 11.3  
From: 0  
To: 555  
Cement:

Note: Hole loaded with mud and temporarily capped pending further testing and/or plugging.  
Hole was relinquished to land owner for use as water well to relieve liability for plugging.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>WIPP-15</b>	Quaternary Deposits	
	Clay	0-34
	Marl	34-99
	Sand	99-153.3
	Clay	153.3-226
	Sand	226-547.2
	Triassic Rocks	
	Chinle	547.2-790.5
	Santa Rosa Sandstone	790.5-812

# GEOLOGIC EXPLORATION BOREHOLE DATA BASE

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**BOREHOLE:** **WIPP-16**  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.08.1290 (State Engineer's Office) 0.08.1182 (reentry)

**LOCATION:** 2356.6' FSL, 138.8' FWL  
Sec. 5, T 21 S, R 30 E

**ELEVATION:** 3383.40' (Top of Casing)  
**TOTAL DEPTH:** 1300'  
**TYPE OF WELL:** Geologic Exploration  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 01/11/80 **Date Completed:** 02/08/80

**CASING RECORD:** Diameter: 13 3/8  
Grade: H-40  
Wt/Ft: 48  
From: 0  
To: 38  
Cement:

Diameter: 4 1/2  
Grade: J-55  
Wt/Ft: 10.5  
From: 0  
To: 459  
Cement:

Note: Hole filled with brine based mud and temporarily abandoned.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:**

**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** WIPP-18  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.08.1123 (State Engineer's Office)

**LOCATION:** 983.58' FNL, 11.85' FEL  
Sec. 20, T 22 S; R 31 E

**ELEVATION:** 3458.7' (Top of Casing)  
**TOTAL DEPTH:** 1060'  
**TYPE OF WELL:** Geologic Exploration/Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 03/14/78      **Date Completed:** 04/03/78

**CASING RECORD:**      Diameter: 7  
Grade: Used  
Wt/Ft: 20  
From: 0  
To: 16  
Cement:

Note: Hole loaded with mud pending further testing and/or plugging.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
WIPP-18	Quaternary Deposits	
	Holocene Deposits	0-5
	Mescalero Caliche	5-9
	Triassic Rocks	
	Santa Rosa Sandstone	9-138
	Permian Rocks	
	Dewey Lake Red Beds	138-613
	Rustler Formation	613-928
	Dissolution Residue	643-655
	Magenta Dolomite Member	672-696
	Dissolution Residue	757-769
	Culebra Dolomite Member	787-808
	Dissolution Residue	812-822
	Salt-bearing Interval	822-928
	Salado Formation	928-1060
	Upper Member	928-1060
	MB 101	1049
	Maximum Depth Recorded	1060

**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** WIPP-19  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.08.1124 (State Engineer's Office)

**LOCATION:** 2286.5' FNL, 12.7' FEL  
Sec. 20, T 22 S, R 31 E

**ELEVATION:** 3435.14' (Top of Casing)  
**TOTAL DEPTH:** 1038'  
**TYPE OF WELL:** Geologic Exploration/Hydrologic Test Hole  
**DRILLER:** Boyles Brothers Drilling

**DRILLING RECORD:**      **Date Started:** 04/06/78      **Date Completed:** 05/08/78

**CASING RECORD:**      Diameter: 7  
Grade: Used  
Wt/Ft: 20  
From: 0  
To: 8  
Cement:

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
WIPP-19	Quaternary Deposits	
	Holocene Deposits	0-7
	Mescalero Caliche	7-14
	Triassic Rocks	
	Santa Rosa Sandstone	14-96
	Permian Rocks	
	Dewey Lake Red Beds	96-590
	Rustler Formation	590-895
	Dissolution Residue	619-629
	Magenta Dolomite Member	647-672
	Dissolution Residue	730-756
	Culebra Dolomite Member	756-779
	Dissolution Residue	781-795
	Salt-bearing Interval	795-895
	Salado Formation	895-1038.2
	Upper Member	895-1038.2
	MB 101	1010-1012
	Maximum Depth Recorded	1034



**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** **WIPP-21**  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.08.1126 (State Engineer's Office)

**LOCATION:** 1450.6' FSL, 11.7' FEL  
Sec. 20, T 22 S, R 31 E

**ELEVATION:** 3418.96' (Top of Casing)  
**TOTAL DEPTH:** 1045'  
**TYPE OF WELL:** Geologic Exploration/Hydrologic Test Hole  
**DRILLER:** Boyles Brothers Drilling

**DRILLING RECORD:** **Date Started:** 05/24/78 **Date Completed:** 05/26/78

**CASING RECORD:** Diameter: 7  
Grade: J-55  
Wt/Ft: 23  
From: 0  
To: 20  
Cement:

Note: Hole loaded with brine mud pending further testing and/or plugging.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
WIPP-21	Quaternary Deposits	
	Holocene Deposits	0-6
	Mescalero Caliche	6-12
	Gatuna Formation	12-39
	Triassic Rocks	
	Santa Rosa Sandstone	39-73
	Permian Rocks	
	Dewey Lake Red Beds	73-560
	Rustler Formation	560-868
	Dissolution Residue	588-601
	Magenta Dolomite Member	618-642
	Dissolution Residue	706-715
	Culebra Dolomite Member	729-753
	Dissolution Residue	755-759
	Salt-bearing Interval	770-868
	Salado Formation	868-1046
	Upper Member	868-1046
	MB 101	986-989
	MB 102	1025-1026
	MB 103	1039
	Maximum Depth Recorded	1046

**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** WIPP-22  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.08.1127 (State Engineer's Office)

**LOCATION:** 2544.9' FSL, 10.82' FEL  
Sec. 20, T 22 S, R 31 E

**ELEVATION:** 3428.12' (Top of Casing)  
**TOTAL DEPTH:** 1450'  
**TYPE OF WELL:** Geologic Exploration/Hydrologic Test Hole  
**DRILLER:** Boyles Brother Drilling

**DRILLING RECORD:** **Date Started:** 05/08/78 **Date Completed:** 05/24/78

**CASING RECORD:** Diameter: 7  
Grade: Used  
Wt/Ft: 20  
From: 0  
To: 20  
Cement:

Note: Hole loaded with mud pending further testing and/or plugging.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
WIPP-22	Quaternary Deposits	
	Holocene Deposits	0-6
	Mescalero Caliche	6-13
	Triassic Rocks	
	Santa Rosa Sandstone	13-81
	Permian	
	Dewey Lake Red Beds	81-574
	Rustler Formation	574-885
	Dissolution Residue	603-614
	Magenta Dolomite Member	630-654
	Dissolution Residue	717-728
	Culebra Dolomite Member	742-764
	Dissolution Residue	767-773
	Salt Interval	777-885
	Salado Formation	885-1450
	Upper Member	883-1363
	MB 101	1000-1003
	MB 102	1036-1037
	MB 103	1049-1063
	MB 104	1071-1072
	MB 105	1086-1087
	MB 106	1102-1103
	MB 107	1142-1143
	MB 108	1150-1151
	MB 109	1172-1196
	MB 111	1242-1243
	MB 112	1259-1261
	MB 113	1285-1286
	MB 114	1307-1308
	MB 115	1342-1344
	MB 116	1353-1355
	McNutt Potash Unit	1363-1450
	Vaca Triste Sandstone Member	1363-1367
	MB 117	1426-1427
	Maximum Depth Recorded	1448

**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** **WIPP-25**  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.08.1172 (State Engineer's Office)

**LOCATION:** 1852.77' FSL, 2838.10' FEL  
Sec. 15, T 22 S, R 30 E

**ELEVATION:** 3214.39' (Top of Casing)  
**TOTAL DEPTH:** 650'  
**TYPE OF WELL:** Geologic Exploration/Hydrologic Test Hole  
**DRILLER:** Boyles Brothers Drilling

**DRILLING RECORD:** **Date Started:** 08/28/78 **Date Completed:** 09/12/78

**CASING RECORD:** Diameter: 7  
Grade: J-55  
Wt/Ft: 23  
From: 0  
To: 21  
Cement:

Diameter: 5 1/2  
Grade: K-55  
Wt/Ft: 15.5  
From: 0  
To: 649  
Cement: 269 Cu. Ft.

Note: 7" casing pulled. Culebra perforated from 445-475 with 120 holes spaced at 4 holes per foot. Magenta perforated from 300-330 with 120 holes spaced at 4 holes per foot. Rustler perforated from 579-608 with 116 holes spaced at 4 holes per foot. Top of Pip Packers set at 572.7 and 365.1.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
WIPP-25	Pleistocene Deposits	0-17
	Permian Rocks	
	Dewey Lake Red Beds	17-232
	Rustler Formation	232-565
	Dissolution Residue	270-287
	Magenta Dolomite Member	302-328
	Dissolution Residue	415-424
	Culebra Dolomite Member	447-472
	Dissolution Residue	475-512
	Salado Formation	565-655 (T.D.)
	Upper Member	565-600
	Dissolution Residue	565-600
	MB 101	589
	MB 102	599
	Salt Interval	600-655
	MB 103	615
	MB 104	628
	MB 105	640
	Maximum Depth Recorded on Geophysical Logs	651

**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** **WIPP-26**  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.08.1173 (State Engineer's Office)

**LOCATION:** 2232.27' FNL, 12.20' FEL  
Sec. 29, T 22 S, R 30 E

**ELEVATION:** 3153.20' (Top of Casing)  
**TOTAL DEPTH:** 503'  
**TYPE OF WELL:** Geologic Exploration/Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 08/28/78 **Date Completed:** 09/11/78

**CASING RECORD:** Diameter: 7  
Grade: J-55  
Wt/Ft: 23  
From: 0  
To: 268  
Cement:

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 502  
Cement: 510 Cu. Ft.

Note: 7" casing pulled. Culebra perforated from 185-210 with 100 holes spaced at 4 holes per foot. Magenta perforated from 70-100 with 120 holes spaced at 4 holes per foot, and from 50-70 with 80 holes spaced at 4 holes per foot. Rustler perforated from 288-329 with 164 holes spaced at 4 holes per foot. Top of Pip Packers set at 269 and 139.1.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
WIPP-26	Holocene Deposits	0-10
	Permian Rocks	
	Rustler Formation	10-309
	Dissolution Residue	34-50
	Magenta Dolomite Member	70-99
	Dissolution Residue	152-174
	Culebra Dolomite Member	186-209
	Dissolution Residue	213-234
	Salado Formation	309-503
	Upper Member	309-503
	Dissolution Residue	309-320
	Salt Interval	320-503
	MB 101	387
	MB 102	423
	MB 103	460
	MB 104	469
	MB 105	481
	MB 106	495
	Maximum Depth Recorded	503



**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** WIPP-27  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.08.1174 (State Engineer's Office)

**LOCATION:** 89.79' FNL, 1485.03' FWL  
Sec. 21, T 21 S, R 30 E

**ELEVATION:** 3178.98' (Top of Casing)  
**TOTAL DEPTH:** 592'  
**TYPE OF WELL:** Geologic Exploration/Hydrologic Test Hole  
**DRILLER:** Boyles Brothers Drilling

**DRILLING RECORD:**      **Date Started:** 09/12/78      **Date Completed:** 10/09/78

**CASING RECORD:**      Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 588  
Cement: 440 Cu. Ft.

Note: Culebra perforated from 290-320 with 120 holes spaced at 4 holes per foot. Magenta perforated from 175-195 with 80 holes spaced at 4 holes per foot. Rustler perforated from 425-460 with 135 holes and from 483-513 with 120 holes spaced at 4 holes per foot. Top of Pig Packers set at 399.4 and 267.4.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
WIPP-27	Quaternary Deposits	
	Holocene Deposits	0-74
	Mescalero Caliche	74-79
	Permian Rocks	
	Dewey Lake Red Beds	79-152
	Rustler Formation	152-421
	Dissolution Residue	152-193
	Magenta Dolomite Member	175-193
	Dissolution Residue	270-281
	Culebra Dolomite Member	292-318
	Dissolution Residue	321-421
	Salado Formation	421-592
	Upper Member	421-592
	Dissolution Residue	421-509
	MB 101	442-447
	MB 102	449-451
	MB 103	456-468
	MB 107-108	481-484
	MB 109	487-494
	Salt Interval	509-592
	MB 113	548-550
	Maximum Depth Recorded	592

**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** WIPP-28  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.08.1175 (State Engineer's Office)

**LOCATION:** 98.72' FNL, 2400.99' FEL  
Sec. 18, T 21 S, R 31 E

**ELEVATION:** 3349.21' (Top of Casing)  
**TOTAL DEPTH:** 801'  
**TYPE OF WELL:** Geologic Exploration/Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 08/07/78      **Date Completed:** 08/28/78

**CASING RECORD:**      Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 21  
Cement: Ready Mix

                         Diameter: 7  
Grade: J-55  
Wt/Ft: 23  
From: 0  
To: 223  
Cement:

                         Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 800  
Cement: 314 Cu. Ft.

Note: 7" casing pulled. Culebra perforated from 420-446 with 104 holes spaced at 4 holes per foot. Magenta perforated from 285-310 with 100 holes spaced at 4 holes per foot. Rustler perforated from 549-589 with 160 holes spaced at 4 holes per foot. Top of Pip Packers set at 526.7 and 365.1.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
WIPP-28	Holocene Deposits	0-12
	Permian Rocks	
	Dewey Lake Red Beds	12-215
	Rustler Formation	215-531
	Magenta Dolomite Member	285-310
	Culebra Dolomite Member	420-446
	Salado Formation	531-801 (T.D)
	Upper Member	531-801
	Dissolution Residue	531-589
	MB 101	567
	MB 103	585
	Salt Interval	589-801
	MB 105	598
	MB 106	612
	MB 107	656
	MB 108	664
	MB 109	694
	MB 111	731
	MB 112	743
	MB 113	769
	MB 114	791
	Maximum Depth Recorded	802

**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

---

**BOREHOLE:** WIPP-29  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.08.1176 (State Engineer's Office)

**LOCATION:** 406.62' FSL, 1827.54' FEL  
Sec. 34, T 22 S, R 29 E

**ELEVATION:** 2978.26' (Top of Casing)  
**TOTAL DEPTH:** 377'  
**TYPE OF WELL:** Geologic Exploration/Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 10/03/78 **Date Completed:** 10/10/78

**CASING RECORD:** Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 376  
Cement: 135 Cu. Ft.

Note: Top joint of 5.5 casing is 14 lb. Culebra perforated from 10-45 with 140 holes spaced at 4 holes per foot. Rustler perforated from 216-250 with 136 holes spaced at 4 holes per foot. Top of Pip Packers set at 203.7.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
WIPP-29	Holocene Deposits	0-12
	Permian Rocks	
	Rustler Formation	12-143
	Culebra Dolomite Member	12-42
	Salado Formation	143-377 (T.D.)
	Upper Member	143-248
	Dissolution Residue	143-248
	MB 101	175
	MB 102	181
	MB 103	199
	MB 109	228
	McNutt Potash Zone	248-377 (T.D.)
	Dissolution Residue	248-251
	Vaca Triste Sandstone Member	248-251
	Salt Interval	251-377
	MB 117	319
	MB 118	346
	Maximum Depth Recorded	358

**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** **WIPP-30**  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 0.08.1177 (State Engineer's Office)

**LOCATION:** 667.5' FNL, 177.41' FWL  
Sec. 33, T 21 S, R 30 E

**ELEVATION:** 3429.05' (Top of Casing)  
**TOTAL DEPTH:** 913'  
**TYPE OF WELL:** Geologic Exploration/Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 09/08/78 **Date Completed:** 10/02/78

**CASING RECORD:** Diameter: 7  
Grade: J-55  
Wt/Ft: 23  
From: 0  
To: 246  
Cement:

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 912  
Cement: 463 Cu. Ft.

Note: 7" casing pulled. Culebra perforated from 631-654 with 92 holes spaced at 4 holes per foot. Magenta perforated from 510-540 with 120 holes spaced at 4 holes per foot. Rustler perforated from 731-753 with 88 holes spaced at 4 holes per foot. Top of Pip Packers set at 701.1 and 585.4.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>WIPP-30</b>	Permian Rocks	
	Dewey Lake Red Beds	0-449
	Rustler Formation	449-748
	Magenta Dolomite Member	513-537
	Culebra Dolomite Member	631-653
	Salado Formation	748-912 (T.D.)
	Upper Member	748-912
	Salt Interval	748-912
	MB 101	862
	MB 102	894
	MB 103	In Bed at Total Depth
	Maximum Depth Recorded	908



**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** **WIPP-31**  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** Unknown

**LOCATION:** 422.54' FSL, 1762.24' FWL  
Sec. 35, T 20 S, R 30 E

**ELEVATION:** 3401.43' (Top of Casing)  
**TOTAL DEPTH:** 1981.7'  
**TYPE OF WELL:** Geologic Exploration  
**DRILLER:** Chortes Drilling Company

**DRILLING RECORD:** **Date Started:** 07/18/80 **Date Completed:** 09/29/80 (Recompletion)

**CASING RECORD:** Diameter:  
Grade: 6' x 6' CEL  
Wt/Ft:  
From: 0  
To: 5  
Cement: Dirt

Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 3  
To: 37  
Cement: 81 Cu. Ft.

Diameter: 7 5/8  
Grade: J-55  
Wt/Ft: 26.4  
From: 2.5  
To: 808  
Cement: 414 Cu. Ft.

Note: Hole loaded with brine based mud pending further testing and/or plugging.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>WIPP-31</b>	Quaternary Deposits	
	Triassic Rocks	
	Santa Rosa Sandstone	
	Permian Rocks	
	Dewey Lake Red Beds	
	Rustler Formation	
	Dissolution Residue	
	Magenta Dolomite Member	
	Dissolution Residue	
	Culebra Dolomite Member	
	Dissolution Residue	
	Top of Highest Salt in Section	
	Salado Formation	
	Upper Member	
	MB 101	
	MB 102	
	MB 103	

**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** **WIPP-32**  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** SEO: 04/25/79; USGS: 10/15/79

**LOCATION:** 1673.22' FSL, 29.14' FEL  
Sec. 33, T 22 S, R 29 E

**ELEVATION:** 3023.26' (Top of Casing)  
**TOTAL DEPTH:** 390'  
**TYPE OF WELL:** Geologic Exploration  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 08/07/79 **Date Completed:** 08/23/79

**CASING RECORD:** No casing used.

**PLUGGING SCHEDULE:** Note: Hole plugged to surface with 500 Cu. Ft. cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>WIPP-32</b>	Quaternary Deposits	
	Triassic Rocks	
	Santa Rosa Sandstone	
	Permian Rocks	
	Dewey Lake Red Beds	
	Rustler Formation	
	Dissolution Residue	
	Magenta Dolomite Member	
	Dissolution Residue	
	Culebra Dolomite Member	
	Dissolution Residue	
	Top of Highest Salt in Section	
	Salado Formation	
	Upper Member	
	MB 101	
	MB 102	
	MB 103	

**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** WIPP-33  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** SEO: 04/25/79

**LOCATION:** 1762.48' FSL, 2426.65' FWL  
Sec. 13, T 22 S, R 30 E

**ELEVATION:** 3323.23' (Top of Casing)  
**TOTAL DEPTH:** 840'  
**TYPE OF WELL:** Geologic Exploration  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 07/13/79      **Date Completed:** 07/26/79

**CASING RECORD:**      Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 38  
Cement: 192 Cu. Ft.

Note: Hole filled with brine based mud. Fluid level at 27 ft.

**PLUGGING SCHEDULE:**      No plugging data.

**STRATIGRAPHIC SUMMARY:**      Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>WIPP-33</b>	Quaternary Deposits	
	Triassic Rocks	
	Santa Rosa Sandstone	
	Permian Rocks	
	Dewey Lake Red Beds	
	Rustler Formation	
	Dissolution Residue	
	Magenta Dolomite Member	
	Dissolution Residue	
	Culebra Dolomite Member	
	Dissolution Residue	
	Top of Highest Salt in Section	
	Salado Formation	
	Upper Member	
	MB 101	
	MB 102	
	MB 103	

**GEOLOGIC EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** WIPP-34  
**OPERATOR:** Sandia National Laboratories  
**PERMIT NO.:** 08.08.1291 (State Engineer's Office) 08.08.1195 (reentry)

**LOCATION:** 201.78' FSL, 1999.73' FWL  
Sec. 9, T 22 S, R 31 E

**ELEVATION:** 3433' (Top of Casing)  
**TOTAL DEPTH:** 1820'  
**TYPE OF WELL:** Geologic Exploration  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 08/16/79 **Date Completed:** 09/04/79

**CASING RECORD:** Diameter: 13 3/8  
Grade:  
Wt/Ft: 48  
From: 0  
To: 38  
Cement:  
  
Note: Hole filled with brine based mud.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
WIPP-34	Quaternary Deposits	0-11
	Triassic Rocks	
	Santa Rosa Sandstone	11-154
	Permian Rocks	
	Dewey Lake Red Beds	154-657
	Rustler Formation	657-973
	Magenta Dolomite Member	716-741
	Culebra Dolomite Member	834-861
	Salado Formation	973-1820+
	Upper Unit	973-1437
	MB 101	1092
	MB 102	1122
	MB 103	1148
	MB 104	1158
	MB 105	1173
	MB 106	1191
	MB 107	1228
	MB 108	1237
	MB 109	1280
	MB 110	1317
	MB 111	1326
	MB 112	1344
	MB 113	1366
	MB 114	1396
	MB 115	1420
	MB 116	1430
	McNutt Potash Unit	1437-1751
	Vaca Triste Sandstone Member	1437-1442
	MB 117	1498
	MB 118	1520
	MB 119	1540
	MB 120	1560
	MB 121	1573
	MB 122	1580
	Union Anhydrite	1599-1607
	MB 123	1676
	MB 124	1690
	MB 125	---
	MB 126	1751
	Lower Unit	1751-1820+
	MB 127	1768
	MB 128	1775
	MB 129	1785



**HYDROLOGIC TEST BOREHOLE DATA BASE**

**BOREHOLE:** H-1  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.979 (State Engineer's Office)

**LOCATION:** 623.2' FNL, 1083.1' FWL Sec.  
29, T 22 S, R 31 E

**ELEVATION:** 3399.53' (Top of Casing)  
**TOTAL DEPTH:** 856'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 05/20/76 **Date Completed:** 06/10/76

**CASING RECORD:** Diameter: 10 1/8  
Grade:  
Wt/Ft: 40.5  
From: 0  
To: 48  
Cement: 51 Cu. Ft.

Diameter: 7  
Grade: K-55  
Wt/Ft: 26  
From: 0  
To: 848  
Cement: 192 Cu. Ft.

Note: Perforated from 803 to 827 with 72 holes, 703 to 683 with 3 holes per foot, 683 to 675 with 3 holes per foot, 562 to 590 with 3 holes per foot. All depths are measured from Kelly Bushing 8' above ground level except DST's which are measured from ground level.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-1</b>	Holocene	
	Surficial Deposits	0-15
	Pleistocene	
	Gatuna Formation	15-35
	Ochoan	
	Dewey Lake Red Beds	35-502
	Rustler Formation	502-824
	Magenta Dolomite Member	563-589
	Culebra Dolomite Member	676-699
	Top of Salado	824
	Total Depth	856

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-2a  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.990 (State Engineer's Office)

**LOCATION:** 726.96' FNL, 1697.64', FWL  
Sec. 29, T 22 S, R 31 E

**ELEVATION:** 3378.09' (Top of Casing)  
**TOTAL DEPTH:** 672'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 02/14/77      **Date Completed:** 02/21/77

**CASING RECORD:**      Diameter: 10 3/4  
Grade:  
Wt/Ft:  
From: 0  
To: 33  
Cement: 54 Cu. Ft.

                         Diameter: 6 5/8  
Grade: J-55  
Wt/Ft: 24  
From: 0  
To: 511  
Cement: 260 Cu. Ft.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-2a</b>	Holocene	
	Surficial Deposit	0-14
	Pleistocene	
	Gatuna Formation	14-38
	Ochoan	
	Dewey Lake Red Beds	38-457
	Rustler Formation	457-672 (T.D.)
	Forty-Niner Member	457-515
	Magenta Dolomite Member	515-543
	Tamarisk Member	543-623
	Culebra Dolomite Member	623-645
	Unnamed Part	645-672 (T.D.)
	Total Depth	672

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-2b1  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.990 (State Engineer's Office)

**LOCATION:** 695.57' FNL, 1660.57' FWL,  
Sec. 29, T 22 S, R 31 E

**ELEVATION:** 3378.46 (Top of Casing)  
**TOTAL DEPTH:** 661'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 02/07/77      **Date Completed:** 02/14/77

**CASING RECORD:**      Diameter: 10 3/4  
Grade:  
Wt/Ft:  
From: 0  
To: 33  
Cement: 54 Cu. Ft.

Diameter: 6 5/8  
Grade: J-55  
Wt/Ft: 24  
From: 0  
To: 609  
Cement: 282 Cu. Ft.

Note: Perforated from 510'-538' with 3 holes per foot.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-2b1</b>	Holocene	
	Surficial Deposit	0-14
	Pleistocene	
	Gatuna Formation	14-38
	Ochoan	
	Dewey Lake Red Beds	38-457
	Rustler Formation	457-661
	Forty-Niner Member	457-515
	Magenta Dolomite Member	515-543
	Tamarisk Member	543-623
	Culebra Dolomite Member	623-645
	Unnamed Part	645-661
	Total Depth	661

## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-2b2  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.990 (State Engineer's Office)

**LOCATION:** 700.6' FNL, 1690.8' FWL, Sec.  
29, T 22 S, R 31 E

**ELEVATION:** 3378.31' (Top of Casing)  
**TOTAL DEPTH:** 660'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 07/16/83      **Date Completed:** 05/03/84

**CASING RECORD:**      Diameter: 9.625 O.D.  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 20  
Cement:

Diameter: 5.5 O.D.  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 620  
Cement:

Note: Open 613-650'.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-2b2</b>	Holocene	
	Surficial Deposits	0-14
	Quaternary	
	Gatuna Formation	14-38
	Permian	
	Dewey Lake Red Beds	38-457
	Rustler Formation	457-660 (T.D.)
	Forty-Niner Member	457-515
	Magenta Dolomite Member	515-543
	Tamarisk Member	543-623
	Culebra Dolomite Member	623-645
	Unnamed Part	645-660 (T.D.)



## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-2c  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.990 (State Engineer's Office)

**LOCATION:** 637.15' FNL, 1708.62' FWL,  
Sec. 29, T 22 S, R 31 E

**ELEVATION:** 3378.41' (Top of Casing)  
**TOTAL DEPTH:** 795'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 01/28/77      **Date Completed:** 02/05/77

**CASING RECORD:**      Diameter: 10 3/4  
Grade:  
Wt/Ft:  
From: 0  
To: 33  
Cement: 54 Cu. Ft.

Diameter: 6 5/8  
Grade: J-55  
Wt/Ft: 24  
From: 0  
To: 742  
Cement: 339 Cu. Ft.

Note: Perforated from 618-655 with 3 holes per foot.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-2c</b>	Holocene	
	Surficial Deposits	0-34
	Quaternary	
	Gatuna Formation	0-34
	Permian	
	Dewey Lake Red Beds	34-457
	Rustler Formation	
	Magenta Dolomite Member	515-540
	Culebra Dolomite Member	624-642
	Top of Rustler Salt	642
	Salado Formation	764-795 (T.D.)
	Maximum Depth	795

## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-3b1  
**OPERATOR:** Sandia National Lab  
**PERMIT NO.:** 0.08.991 (State Engineer's Office)

**LOCATION:** 2085.31' FSL, 138.10' FEL,  
Sec. 29, T 22 S, R 31 E

**ELEVATION:** 3390.64' (Top of Casing)  
**TOTAL DEPTH:** 902'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 07/25/76      **Date Completed:** 08/12/76

**CASING RECORD:**      Diameter: 10 3/4  
Grade:  
Wt/Ft: 40.5  
From: 0  
To: 38  
Cement: 54 Cu. Ft.

Diameter: 6 5/8  
Grade: J-55  
Wt/Ft: 24  
From: 0  
To: 891  
Cement: 625 Sacks

Note: Perforated from 813 to 837 with 72 holes, 683 to 703 with 3 holes per ft, 675 to 683 with 3 holes per ft, 562 to 590 with 3 holes per ft.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-3b1</b>	Holocene	
	Surficial Deposits	0-4
	Quaternary	
	Gatuna Formation	4-22
	Permian	
	Dewey Lake Red Beds	22-502
	Rustler Formation	502-821
	Magenta Dolomite Member	559-584
	Culebra Dolomite Member	672-694
	Top of Rustler Salt	Not Given
	Salado Formation	821- T.D.
	Maximum Depth	902

## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-3b2  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.991 (State Engineer's Office)

**LOCATION:** 2122.15' FSL, 231.29' FEL,  
Sec. 29, T 22 S, R 31 E

**ELEVATION:** 3390.03' (Top of Casing)  
**TOTAL DEPTH:** 725'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**                      **Date Started:**                      **Date Completed:**

**CASING RECORD:**                      Diameter: 5 1/2 O.D.  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 672.7  
Cement:

**PLUGGING SCHEDULE:**                      No plugging data.

**STRATIGRAPHIC SUMMARY:**                      Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-3b2</b>	Surficial Deposits	0-11
	Gatuna Formation	
	Dockum Group	11-65
	Dewey Lake Red Beds	65-565.7
	Rustler Formation	565.7-788.7
	Magenta Dolomite Member	564-590
	Culebra Dolomite Member	676-700
	Salado Formation	
	Upper Member	
	McNutt Member	
	Lower Member	
	Total Depth	725

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-3b3  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.991 (State Engineer's Office)

**LOCATION:** 2022.35' FSL, 217.30' FEL,  
Sec. 29, T 22 S, R 31 E

**ELEVATION:** 3388.67' (Top of Casing)  
**TOTAL DEPTH:** 730'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:**      **Date Completed:** 01/30/84

**CASING RECORD:**      Diameter: 5.5  
Grade: J-55  
Wt/Ft: 15.5  
From: .50  
To: 670.5  
Cement: Casing cemented in place

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-3b3</b>	Surficial Deposits	
	Gatuna Formation	
	Dockum Group	
	Dewey Lake Red Beds	
	Rustler Formation	
	Magenta Dolomite Member	563-586
	Culebra Dolomite Member	673-696
	Salado Formation	
	Upper Member	
	McNutt Member	
	Lower Member	
	Castile Formation	



**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-3d (H-3b4)  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.991 (State Engineer's Office)

**LOCATION:** 2067.3' FSL, 164.3' FEL, Sec.  
29, T 22 S, R 31 E

**ELEVATION:** 3390.01' (Top of Casing)  
**TOTAL DEPTH:** 554'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** **Date Completed:**

**CASING RECORD:** Diameter: 8 5/8  
Grade:  
Wt/Ft:  
From: 0  
To: 39  
Cement:  
  
Note: 7 7/8" uncased borehole 33-559'.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-3d</b>	Surficial Deposits	
	Gatuna Formation	
	Dockum Group	
	Dewey Lake Red Beds	420
	Rustler Formation	
	Forty-Niner Member	508-537
	Forty-Niner Claystone Member	537-547
	Salado Formation	
	Upper Member	
	McNutt Member	
	Lower Member	
	Castile Formation	

## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-4a  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1153 (State Engineer's Office)

**LOCATION:** 545.89' FNL, 720.00' FWL,  
Sec. 5, T 23 S, R 31 E

**ELEVATION:** 3333.29' (Top of Casing)  
**TOTAL DEPTH:** 415'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 04/30/78      **Date Completed:** 05/23/78

**CASING RECORD:**      Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 32  
Cement: 63 Cu. Ft.

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 364  
Cement: 173 Cu. Ft.

Note: Hole in standby condition for hydro tracer tests. 4 1/2" inflatable packer set at 485' on 1 1/2" galvanized pipe. 1 3/8" pump cylinder set at 499' in the Culebra Dolomite. The hole is dual completion across the Magenta and Culebra Dolomites.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-4a</b>	Holocene	
	Surficial Deposits	0-13
	Pleistocene	
	Gatuna Formation	13-29
	Ochoan	
	Dewey Lake Red Beds	29-315
	Rustler Formation	315
	Magenta Dolomite Member	375-400
	Total Depth	415

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-4b  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1154 (State Engineer's Office)

**LOCATION:** 498.47' FNL, 632.54' FWL,  
Sec. 5, T 23 S, R 31 E

**ELEVATION:** 3333.35 (Top of Casing)  
**TOTAL DEPTH:** 529'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 04/30/78 **Date Completed:** 05/15/78

**CASING RECORD:** Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 33  
Cement: 63 Cu. Ft.

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 476  
Cement: 269 Cu. Ft.

Note: Hole is in standby condition for hydro tracer tests.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-4b</b>	Surficial Deposits	0-13
	Gatuna Formation	13-29
	Dockum Group	NP
	Dewey Lake Red Beds	29-315
	Rustler Formation	315-T.D.
	Magenta Dolomite Member	377-402
	Culebra Dolomite Member	498-522
	Salado Formation	
	Upper Member	
	McNutt Member	
	Lower Member	
	Total Depth	529

## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-4c  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1152 (State Engineer's Office)

**LOCATION:** 446.36 FNL, 717.89 FWL,  
Sec. 5, T 23 S, R 31 E

**ELEVATION:** 3334.04' (Top of Casing)  
**TOTAL DEPTH:** 661'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 04/30/78 **Date Completed:** 05/09/78

**CASING RECORD:** Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 33  
Cement: 63 Cu. Ft.

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 610  
Cement: 270 Cu. Ft.

Note: Bridge plug at 530'. Perforated from 494' to 520' with 104 holes spaced at 4 holes per foot. Hole in standby condition for hydro tracer tests.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-4c</b>	Surficial Deposits	0-13
	Gatuna Formation	13-29
	Dockum Group	NP
	Dewey Lake Red Beds	29-315
	Rustler Formation	315-626
	Magenta Dolomite Member	377-403
	Culebra Dolomite Member	490-516
	Salado Formation	626-661



## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-5a  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1159 (State Engineer's Office)

**LOCATION:** 1091.98 FNL, 185.03 FEL,  
Sec. 15, T 22 S, R 31 E

**ELEVATION:** 3506.19 (Top of Casing)  
**TOTAL DEPTH:** 824'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 05/22/78 **Date Completed:** 06/20/78

**CASING RECORD:** Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 38  
Cement: 72 Cu. Ft.

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 774  
Cement: 192 Cu. Ft.

Note: Hole in standby condition for hydro tracer tests. 4 1/2" inflatable packer set at 895' on 1 1/2" galvanized pipe. 1 3/8" pump cylinder set at 905' in the Culebra Dolomite. The hole is dual-completion across the Magenta and Culebra Dolomites.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:**

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-5b  
**OPERATOR:** Sandia National Lab  
**PERMIT NO.:** 0.08.1160 (State Engineer's Office)

**LOCATION:** 1008.30' FNL, 236.22' FEL,  
Sec. 15, T 22 S, R 31 E

**ELEVATION:** 3506.04' (Top of Casing)  
**TOTAL DEPTH:** 925'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 05/22/78 **Date Completed:** 06/13/78

**CASING RECORD:** Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 38  
Cement: 72 Cu. Ft.

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 881  
Cement: 336 Cu. Ft.

Note: Hole is in standby condition for hydro tracer tests.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-5b</b>	Surficial Deposits	0-8
	Gatuna Formation	NP
	Dockum Group	8-225
	Dewey Lake Red Beds	225-732
	Rustler Formation	732-T.D.
	Magenta Dolomite Member	785-805
	Culebra Dolomite Member	897-920
	Salado Formation	
	Upper Member	
	McNutt Member	
	Lower Member	
	Castile Formation	

## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-5c  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1161 (State Engineer's Office)

**LOCATION:** 1005.55 FNL, 134.95 FEL,  
Sec. 15, T 22 S, R 31 E

**ELEVATION:** 3506.04' (Top of Casing)  
**TOTAL DEPTH:** 1076'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 05/22/78      **Date Completed:** 06/03/78

**CASING RECORD:**      Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 38  
Cement: 72 Cu. Ft.

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 1024  
Cement: 416 Cu. Ft.

Note: Bridge plug set at 935'. Perforated from 895' to 925' with 120 holes spaced at 4 holes per foot. Hole in standby condition for hydro tracer tests.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-5c</b>	Surficial Deposits	0-8
	Gatuna Formation	NP
	Dockum Group	8-225
	Dewey Lake Red Beds	225-732
	Rustler Formation	732-1041
	Magenta Dolomite Member	788-812
	Culebra Dolomite Member	899-924
	Salado Formation	1041-T.D.
	Upper Member	
	McNutt Member	
	Lower Member	
	Total Depth	1076

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-6a  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1162 (State Engineer's Office)

**LOCATION:** 283.30' FNL, 274.34' FWL,  
Sec. 18, T 22 S, R 31 E

**ELEVATION:** 3347.83' (Top of Casing)  
**TOTAL DEPTH:** 525'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 07/06/78      **Date Completed:** 07/11/78

**CASING RECORD:**      Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 38  
Cement: 72 Cu. Ft.

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 475  
Cement: 155 Cu. Ft.

Note: Hole in standby condition for hydro tracer tests. 4 1/2" packer set at 594' on 1 1/2" galvanized pipe. 1 3/8" pump cylinder at 608' in the Culebra Dolomite. The hole is dual-completion across the Magenta and Culebra Dolomites.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:**

## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-6b  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1163 (State Engineer's Office)

**LOCATION:** 196.34' FNL, 332.96' FWL,  
Sec 18, T 22 S, R 31 E

**ELEVATION:** 3348.25' (Top of Casing)  
**TOTAL DEPTH:** 640'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 06/19/78      **Date Completed:** 07/05/78

**CASING RECORD:**      Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 38  
Cement: 72 Cu. Ft.

                         Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 590  
Cement: 210 Cu. Ft.

Note: Hole in standby condition for hydro tracer tests.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-6b</b>	Surficial Deposits	0-12
	Gatuna Formation	12-38
	Dockum Group	NP
	Dewey Lake Red Beds	38-427
	Rustler Formation	427-T.D.
	Magenta Dolomite Member	492-511
	Culebra Dolomite Member	604-627
	Salado Formation	
	Upper Member	
	McNutt Member	
	Lower Member	
	Total Depth	640



**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-6c  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1164 (State Engineer's Office)

**LOCATION:** 281.06' FNL, 374.47' FWL,  
Sec. 18, T 22 S, R 31 E

**ELEVATION:** 3348.52' (Top of Casing)  
**TOTAL DEPTH:** 741'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 06/19/78      **Date Completed:** 06/26/78

**CASING RECORD:**      Diameter: 9 5/8  
Grade: J-55  
Wt/Ft: 36  
From: 0  
To: 38  
Cement: 72 Cu. Ft.

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: +1.29  
To: 699  
Cement: 335 Cu. Ft.

Note: Bridge plug set at 641'. Perforated from 604' to 631' with 108 holes spaced at 4 holes per foot.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-6c</b>	Surficial Deposits	0-12
	Gatuna Formation	12-38
	Dockum Group	NP
	Dewey Lake Red Beds	38-427
	Rustler Formation	427-721
	Magenta Dolomite Member	490-514
	Culebra Dolomite Member	604-627
	Salado Formation	721-T.D.
	Upper Member	
	McNutt Member	
	Lower Member	
	Total Depth	741

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-7a  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08-1271 (State Engineer's Office)

**LOCATION:** 2495.04' FNL, 2492.35' FWL,  
Sec. 14, T 23 S, R 30 E

**ELEVATION:** 3164'  
**TOTAL DEPTH:** 154'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 09/18/79      **Date Completed:** 10/18/79

**CASING RECORD:**      Diameter: 13 3/8  
Grade:  
Wt/Ft: 48  
From: 0  
To: 38  
Cement: 81 Cu. Ft.

Diameter: 7  
Grade:  
Wt/Ft: 23  
From: 0  
To: 109  
Cement: 265 Cu. Ft.

Note: Hole in standby condition for testing.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:**

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-7b1  
**OPERATOR:** Sandia National Lab  
**PERMIT NO.:** 0.08-1272 (State Engineer's Office)

**LOCATION:** 2565.80' FNL, 2563.45' FWL,  
Sec. 14, T 23 S, R 30 E

**ELEVATION:** 3164.17' (Top of Casing)  
**TOTAL DEPTH:** 286'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 09/13/79      **Date Completed:** 09/18/79

**CASING RECORD:**      Diameter: 13 3/8  
Grade:  
Wt/Ft: 48  
From: 0  
To: 38  
Cement: 54 Cu. Ft.

                         Diameter: 7  
Grade:  
Wt/Ft: 23  
From: 0  
To: 230  
Cement: 270 Cu. Ft.

                         Note: Hole in standby condition for testing.

**PLUGGING SCHEDULE:**      No plugging data.

**STRATIGRAPHIC SUMMARY:**      Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-7b1</b>	Holocene	
	Surficial Deposits	0-5
	Pleistocene	
	Gatuna Formation	12-38
	Dockum Group	NP
	Dewey Lake Red Beds	57-87
	Rustler Formation	87-T.D.
	Magenta Dolomite Member	117-140
	Culebra Dolomite Member	237-283
	Salado Formation	
	Upper Member	
	Lower Member	
	Castile Formation	
	Total Depth	286

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-7b2  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** ---- (State Engineer's Office)

**LOCATION:** 2662.16' FNL, 2537.98' FWL,  
Sec. 14, T 23 S, R 30 E

**ELEVATION:** 3164.40' (Top of Casing)  
**TOTAL DEPTH:** 295'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 08/27/83      **Date Completed:** 09/02/83.

**CASING RECORD:**      Diameter: 9 7/8  
Grade:  
Wt/Ft:  
From: 0  
To: 20  
Cement: Casing set in cement

                         Diameter: 7  
Grade: J-55  
Wt/Ft: 20  
From: 0  
To: 230.19  
Cement: Cemented in place

**PLUGGING SCHEDULE:**      Hole was back filled with peu gravel from 295' to 268' and left open for testing.

**STRATIGRAPHIC SUMMARY:**      Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-7b2</b>	Surficial Deposits	
	Gatuna Formation	57
	Dockum Group	NP
	Dewey Lake Red Beds	57-87
	Rustler Formation	87-T.D.
	Magenta Dolomite Member	117-140
	Culebra Dolomite Member	232-280
	Salado Formation	
	Upper Member	
	McNutt Member	
	Lower Member	
	Total Depth	295

**HYDROLOGIC TEST BOREHOLE DATA BASE**

---

**BOREHOLE:** H-7c  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:**

**LOCATION:** 2591.93' FNL, 2467.51' FWL,  
Sec. 14, T 23 S, R 30 E

**ELEVATION:** 3164.13 (Top of Casing)  
**TOTAL DEPTH:** 420'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 09/06/79 **Date Completed:** 11/02/79

**CASING RECORD:** Diameter: 13 3/8  
Grade:  
Wt/Ft: 48  
From: 0  
To: 38  
Cement: 68 Cu. Ft.

Diameter: 7  
Grade: J-55  
Wt/Ft: 23  
From: 0  
To: 356  
Cement: 706 Cu. Ft.

Note: Hole in standby condition for testing. Slotted liner installed from 347' to 420'.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached



**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-7c</b>	Holocene	
	Unconsolidated Alluvium and Dune Sand	0-5
	Pleistocene	
	Gatuna Formation	5-57
	Permian	
	Dewey Lake Red Beds	57-87
	Rustler Formation	87-283
	Magenta Dolomite Member	117-140
	Culebra Dolomite Member	237-273.5
	Salado Formation	283-420
	Dissolution Residue	283-405
	Top of Salt Interval	405
	Total Depth	420

## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-8a  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1274 (State Engineer's Office)

**LOCATION:** 1962.61' FNL, 1486.59' FEL,  
Sec. 23, T 24 S, R 30 E

**ELEVATION:** 3432.99' (Top of Casing)  
**TOTAL DEPTH:** 505'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 09/07/79      **Date Completed:** 09/18/79

**CASING RECORD:**      Diameter: 13 3/8  
Grade:  
Wt/Ft: 48  
From: 0  
To: 38  
Cement: 108 Cu. Ft.

                         Diameter: 7  
Grade:  
Wt/Ft: 23  
From: 0  
To: 452  
Cement: 393

                         Note: Hole in standby condition for testing

**PLUGGING SCHEDULE:**      No plugging data.

**STRATIGRAPHIC SUMMARY:**

## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-8b  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1275 (State Engineer's Office)

**LOCATION:** 1994.76' FNL, 1405.41' FEL,  
Sec. 23, T 24 S, R 30 E

**ELEVATION:** 3433.64' (Top of Casing)  
**TOTAL DEPTH:** 624'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 08/06/79      **Date Completed:** 08/12/79

**CASING RECORD:**      Diameter: 13 3/8  
Grade:  
Wt/Ft: 48  
From: 0  
To: 38  
Cement: 108 Cu. Ft.

..      Diameter: 7  
Grade:  
Wt/Ft: 20  
From: 0  
To: 574  
Cement: 378 Cu. Ft.

Note: Hole in standby condition for testing.

**PLUGGING SCHEDULE:**      No plugging data.

**STRATIGRAPHIC SUMMARY:**      Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-8b</b>	Surficial Deposits	0-10
	Gatuna Formation	10-153
	Dockum Group	NP
	Dewey Lake Red Beds	153-399
	Rustler Formation	399-T.D.
	Magenta Dolomite Member	466-490
	Culebra Dolomite Member	586-613
	Salado Formation	
	Upper Member	
	McNutt Member	
	Lower Member	
	Total Depth	624

**HYDROLOGIC TEST BOREHOLE DATA BASE**

---

**BOREHOLE:** H-8c  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1276 (State Engineer's Office)

**LOCATION:** 2059.36' FNL, 1470.14' FEL,  
Sec. 23, T 24 S, R 30 E

**ELEVATION:** 3432.90' (Top of Casing)  
**TOTAL DEPTH:** 808'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 07/27/79 **Date Completed:** 08/06/79

**CASING RECORD:** Diameter: 13 3/8  
Grade:  
Wt/Ft: 48  
From: 0  
To: 38  
Cement: 108 Cu. Ft.

Diameter: 7  
Grade:  
Wt/Ft: 20  
From: 0  
To: 734  
Cement: 314 Cu. Ft.

Note: Hole is standby condition for testing.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-8c</b>	Holocene	
	Unconsolidated Alluvium and Eolian Sand	0-4
	Pleistocene Rocks	
	Mescalero Caliche	4-10
	Gatuna Formation	10-153
	Permian	
	Dewey Lake Red Beds	153-399
	Rustler Formation	399-733
	Magenta Dolomite Member	466-488
	Culebra Dolomite Member	588-614
	Salado Formation	733-
	Dissolution Residue	733-774
	MB 103	774-786
	Top of Salt Interval	798
	Total Depth	808

## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-9a  
**OPERATOR:** Sandia National Lab  
**PERMIT NO.:** 0.08.1277 (State Engineer's Office)

**LOCATION:** 2392.14' FNL, 138.92' FWL,  
Sec. 4, T 24 S, R 31 E

**ELEVATION:** 3406.68' (Top of Casing)  
**TOTAL DEPTH:** 692'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 07/09/79      **Date Completed:** 08/23/83

**CASING RECORD:**      Diameter: 13 3/8  
Grade:  
Wt/Ft: 48  
From: 0  
To: 38  
Cement: 72 Cu. Ft.

                         Diameter: 7  
Grade: J-55  
Wt/Ft: 20  
From: 0  
To: 570  
Cement: 266 Cu. Ft.

                         Diameter: 4.5" O.D.  
Grade: J-55  
Wt/Ft: 9.5  
From: 0  
To: 643  
Cement:

                         Note: Hole in standby condition for testing.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-9a</b>	Holocene	
	Surficial Deposits	0-5
	Pleistocene	
	Gatuna Formation	5-25
	Ochoan	
	Dewey Lake Red Beds	25-455
	Rustler Formation	455-T.D.
	Forty-Niner Member	455-523
	Magenta Dolomite Member	523-554
	Tamarisk Member	554-647
	Culebra Dolomite Member	647-677
	Unnamed Part	677-T.D.
	Total Depth	692



## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-9b  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1278 (State Engineer's Office)

**LOCATION:** 2391.04' FNL, 238.63' FWL,  
Sec. 4, T 24 S, R 31 E

**ELEVATION:** 3406.86' (Top of Casing)  
**TOTAL DEPTH:** 708'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 08/14/79      **Date Completed:** 08/28/79

**CASING RECORD:**      Diameter: 13 3/8  
Grade: K-55  
Wt/Ft: 48  
From: 0  
To: 38  
Cement: 72 Cu. Ft.

Diameter: 7  
Grade: J-55  
Wt/Ft: 23  
From: 0  
To: 638  
Cement: 295 Cu. Ft.

Note: Hole in standby condition for testing.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-9b</b>	Surficial Deposits	0-5
	Gatuna Formation	5-25
	Dockum Group	NP
	Dewey Lake Red Beds	24-455
	Rustler Formation	455-T.D.
	Magenta Dolomite Member	523-554
	Culebra Dolomite Member	647-677
	Salado Formation	
	Upper Member	
	McNutt Member	
	Lower Member	
	Total Depth	708

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-9c  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1279 (State Engineer's Office)

**LOCATION:** 2479.06' FNL, 188.02' FWL,  
Sec. 4, T 24 S, R 31 E

**ELEVATION:** 3407.30' (Top of Casing)  
**TOTAL DEPTH:** 816'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 08/01/79 **Date Completed:** 09/24/79

**CASING RECORD:** Diameter: 13 3/8  
Grade: K-55  
Wt/Ft: 48  
From: 0  
To: 38  
Cement: 72 Cu. Ft.

Diameter: 7  
Grade: J-55  
Wt/Ft: 20  
From: 0  
To: 783  
Cement: 320 Cu. Ft.

Note: Hole in standby condition for testing.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:**

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-10a  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1280 (State Engineer's Office)

**LOCATION:** 433.0' FSL, 2068.9' FEL, Sec.  
20, T 23 S, R 32 E

**ELEVATION:** 3688.67' (Top of Casing)  
**TOTAL DEPTH:** 1318'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 08/21/79 **Date Completed:** 08/26/79

**CASING RECORD:** Diameter: 13 3/8  
Grade: K-55  
Wt/Ft: 48  
From: 0  
To: 38  
Cement: 72 Cu. Ft.

Diameter: 7  
Grade: J-55  
Wt/Ft: 23  
From: 0  
To: 1243  
Cement: 519 Cu. Ft.

Note: Hole in standby condition for testing.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:**

## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-10b  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1281 (State Engineer's Office)

**LOCATION:** 484.5' FSL, 1981.8' FEL, Sec.  
20, T 23 S, R 32 E

**ELEVATION:** 3689.47' (Top of Casing)  
**TOTAL DEPTH:** 1398'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 10/07/79 **Date Completed:** 10/13/79

**CASING RECORD:** Diameter: 13 3/8  
Grade:  
Wt/Ft: 48  
From: 0  
To: 38  
Cement: 72 Cu. Ft.

Diameter: 7  
Grade: J-55  
Wt/Ft: 23  
From: 0  
To: 1346  
Cement: 480 Cu. Ft.

Note: Hole in standby condition for possible future tests.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:**

## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-10c  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1282 (State Engineer's Office)

**LOCATION:** 384.5' FSL, 1981.8 FEL, Sec.  
20, T 23 S, R 32 E

**ELEVATION:** 3687'  
**TOTAL DEPTH:** 1550'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 08/11/79 **Date Completed:** 08/20/79

**CASING RECORD:** Diameter: 13 3/8  
Grade: K-55  
Wt/Ft: 48  
From: 0  
To: 38  
Cement: 72 Cu. Ft.

Diameter: 7  
Grade:  
Wt/Ft: 20  
From: 0  
To: 1483  
Cement: 627 Cu. Ft.

Note: Hole in standby condition for testing.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
H-10c	Holocene	
	Unconsolidated Alluvium and Eolian Sand	0-5
	Pleistocene	
	Mescalero Caliche	5-9
	Gatuna Formation	9-90
	Triassic	
	Dockum Group	
	Chinle Formation	90-482
	Santa Rosa Sandstone	482-658
	Permian	
	Dewey Lake Red Beds	658-1204
	Rustler Formation	1204-1501
	Magenta Dolomite Member	1256-1280
	Culebra Dolomite Member	1360-1387
	Salado Formation	1501
	Top of Salt Interval	1501
	Total Depth	1538

## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-11b2  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1462 (State Engineer's Office)

**LOCATION:** 1436.3' FSL, 168.7' FEL, Sec.  
33, T 22 S, R 31 E

**ELEVATION:** 3411.64' (Top of Casing)  
**TOTAL DEPTH:** 776'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 10/83      **Date Completed:** 11/28/83

**CASING RECORD:**      Diameter: 9 5/8  
Grade: H-40  
Wt/Ft: 40  
From: 0  
To: 37  
Cement:

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 733.39  
Cement: Cemented

Note: 4 3/4" open hole from 733.39' to the total depth of 776'.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached



**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-11b2</b>	Magenta Dolomite Member	618-644
	Culebra Dolomite Member	733-757
	Total Depth	776

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-11b3  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1462 (State Engineer's Office)

**LOCATION:** 1501.7' FSL, 105.2' FEL, Sec.  
33, T 22 S, R 31 E

**ELEVATION:** 3412.42' (Top of Casing)  
**TOTAL DEPTH:** 788.7' (Below Kelly Bushing)  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 12/01/83 **Date Completed:** 01/84

**CASING RECORD:** Diameter: 9 5/8  
Grade: H-30  
Wt/Ft: 40  
From: 0  
To: 34  
Cement:

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 55  
From: 0  
To: 733  
Cement:

Note: 4 3/4" open hole from 733' to the total depth of 788.7'.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-11b3</b>	Surficial Deposits	
	Gatuna Formation	
	Dockum Group	
	Dewey Lake Red Beds	
	Rustler Formation	
	Magenta Dolomite Member	616-644
	Culebra Dolomite Member	734-759
	Salado Formation	
	Upper Member	
	McNutt Member	
	Lower Member	
	Total Depth	788.7

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-11b4  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1474 (State Engineer's Office)

**LOCATION:** 1514.7' FSL, 320.2' FEL, Sec.  
33, T 22 S, R 31 E

**ELEVATION:** 3410.89' (Top of Casing)  
**TOTAL DEPTH:** 765'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 02/23/88 **Date Completed:** 03/17/88

**CASING RECORD:** Diameter: 8 5/8  
Grade: H-40  
Wt/Ft: 28  
From: 0  
To: 27  
Cement:

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: 0  
To: 714  
Cement:

Note: 4 3/4 " open hole from 715' to total depth of 765'.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:**

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-12  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1463 (State Engineer's Office)

**LOCATION:** 23.1' FNL, 91.9' FEL,  
Sec. 15, T 23 S, R 31 E

**ELEVATION:** 3427.19' (Top of Casing)  
**TOTAL DEPTH:** 1001'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 10/03/83 **Date Completed:** 10/18/83

**CASING RECORD:** Diameter: 9 5/8  
Grade: H-40  
Wt/Ft: 36  
From: 0  
To: 37  
Cement: 63 Cu. Ft.

Diameter: 5 1/2  
Grade: J-55  
Wt/Ft: 15.5  
From: +1.45  
To: 820  
Cement:

Note: 4 3/4 " open hole from 820' to plugged back depth of 890'.

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-12</b>	Quaternary Deposits	0-10+
	Dockum Group	10+-70
	Dewey Lake Red Beds	70-622
	Rustler Formation	622-976
	Forty-Niner Member	622-678
	Magenta Dolomite Member	678-703
	Tamarisk Member	703-823
	Culebra Dolomite Member	823-850
	Unnamed Lower Member	850-976
	Salado Formation	976-T.D.
	Unnamed Upper Member	976-T.D.
	Total Depth	1001

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-14  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1469 (State Engineer's Office)

**LOCATION:** 372.2' FSL, 562.4' FWL, Sec.  
29, T 22 S, R 31 E

**ELEVATION:** 3347.11' (Top of Casing)  
**TOTAL DEPTH:** 589'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 10/86      **Date Completed:** 10/86

**CASING RECORD:**      Diameter: 8.625  
Grade:  
Wt/Ft: 28  
From: +1.6  
To: 39  
Cement:

Diameter: 5.5  
Grade:  
Wt/Ft: 15.5  
From: 0  
To: 532  
Cement:

**PLUGGING SCHEDULE:** No plugging data.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-14</b>	Surficial Deposits	0-13
	Gatuna Formation	13-40
	Dockum Group	NP
	Dewey Lake Red Beds	40-360
	Rustler Formation	360-T.D.
	Magenta Dolomite Member	424-448
	Culebra Dolomite Member	545-572
	Salado Formation	
	Upper Member	
	McNutt Member	
	Lower Member	
	Total Depth	589



**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-15  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1470 (State Engineer's Office)

**LOCATION:** 88.7' FNL, 174.3' FEL, Sec.  
28, T 22 S, R 31 E

**ELEVATION:** 3481.63' (Top of Casing)  
**TOTAL DEPTH:** 900'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**                      **Date Started:** 11/86                      **Date Completed:** 11/86

**CASING RECORD:**                      Diameter: 8.625  
   Grade:  
   Wt/Ft: 28  
   From: 0  
   To: 39

Diameter: 5.5  
Grade:  
Wt/Ft: 15.5  
From: +1.4  
To: 853

**PLUGGING SCHEDULE:**                      No plugging data.

**STRATIGRAPHIC SUMMARY:**                      Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>H-15</b>	Surficial Deposits	0-8
	Gatuna Formation	4-42
	Dockum Group	42-168
	Dewey Lake Red Beds	168-692
	Rustler Formation	692-T.D.
	Magenta Dolomite Member	748-773
	Culebra Dolomite Member	861-883
	Salado Formation	
	Upper Member	
	McNutt Member	
	Lower Member	
	Total Depth	900

**HYDROLOGIC TEST BOREHOLE DATA BASE**

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**BOREHOLE:** H-16  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1471 (State Engineer's Office)

**LOCATION:** 1112.6 FSL, 1241.3 FEL, Sec.  
20, T 22 S, R 31 E

**ELEVATION:** 3406.77' (Top of Casing)  
**TOTAL DEPTH:** 850.9'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 07/13/87      **Date Completed:** 08/18/87

**CASING RECORD:**      Diameter: 10 3/4  
Grade:  
Wt/Ft: 40.5  
From: 0  
To: 36.5

Diameter: 7  
Grade:  
Wt/Ft: 23  
From: 0  
To: 469

Note: 6 1/8" inch open hole from 469' to total depth of 850.9'.

**PLUGGING SCHEDULE:**      No plugging data.

**STRATIGRAPHIC SUMMARY:**

## HYDROLOGIC TEST BOREHOLE DATA BASE

---

**BOREHOLE:** H-17  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1477 (State Engineer's Office)

**LOCATION:** 1465.5' FSL, 994.1' FWL, Sec.  
3, T 23 S, R 31 E

**ELEVATION:** 3385.31' (Top of Casing)  
**TOTAL DEPTH:** 880'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 09/21/87 **Date Completed:** 11/04/87

**CASING RECORD:** Diameter: 10 3/4  
Grade: H-40  
Wt/Ft: 40.5  
From: 0  
To: 38

Diameter: 7  
Grade: J-55  
Wt/Ft: 23  
From: 0  
To: 692

Note: 6 1/8" inch open hole from 693' to the plugged back depth of 773'.

**PLUGGING SCHEDULE:** The borehole was plugged back with cement grout to a total depth of 773' on 11/06/87.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
H-17	Quaternary Deposits	
	Holocene	0-15
	Pleistocene	
	Mescalero Caliche	15-21.5
	Upper Triassic	
	Dockum Group	21.5-55
	Upper Permian	
	Dewey Lake Red Beds	55-509
	Rustler Formation	509-855.7
	Forty-Niner Member	509-564
	Magenta Dolomite Member	564-590.8
	Tamarisk Member	590.8-705.8
	Culebra Dolomite Member	705.8-731.4
	Unnamed Lower Member	731.4-855.7
	Salado Formation	855.7-870.3+

## HYDROLOGIC TEST BOREHOLE DATA BASE

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**BOREHOLE:** H-18  
**OPERATOR:** Sandia National Labs  
**PERMIT NO.:** 0.08.1473 (State Engineer's Office)

**LOCATION:** 964.8' FNL, 445.6' FWL, Sec.  
20, T 22 S, R 31 E

**ELEVATION:** 3414.21' (Top of Casing)  
**TOTAL DEPTH:** 840'  
**TYPE OF WELL:** Hydrologic Test Hole  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:**      **Date Started:** 09/29/87      **Date Completed:** 11/16/87

**CASING RECORD:**      Diameter: 10 3/4  
Grade: H-40  
Wt/Ft: 40.5  
From: 0  
To: 39

Diameter: 7  
Grade: J-55  
Wt/Ft: 23  
From: 0  
To: 673

Note: 6 1/8" inch open hole from 673' to the plugged back depth of 766'.

**PLUGGING SCHEDULE:**      The borehole was plugged back with cement grout to a total depth of 766' on  
11/19/87.

**STRATIGRAPHIC SUMMARY:**      Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
H-18	Quaternary Deposits	
	Holocene	
	Drill Pad Material & Unconsolidated Sand	0-5
	Pleistocene	
	Mescalero Caliche	5-8
	Upper Triassic	
	Dockum Group	8-20
	Upper Permian	
	Dewey Lake Red Beds	20-506.1
	Rustler Formation	506.1-820.9
	Forty-Niner Member	506.1-571.2
	Magenta Dolomite	571.2-594.2
	Tamarisk Member	594.2-688.6
	Culebra Dolomite Member	688.6-712.8
	Unnamed Lower Member	712.8-820.9
	Salado Formation	820.9-830.5+

**POTASH BOREHOLE DATA BASE**

---

**BOREHOLE:** P-1  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 327' FSL, 551' FWL of Sec. 29, SW 1/4  
Sec. 29, T 22 S, R 31 E

**ELEVATION:** 3345'  
**TOTAL DEPTH:** 1591'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Pennsylvania Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:**      **Date Started:** 08/23/76      **Date Completed:** 09/02/76

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:**      4-1/2" Casing: Unknown  
Recovered: 203' of casing left  
in hole between 591-794' below  
land surface.

**WATER HORIZONS:** Unknown  
**RUSTLER FORMATION:** 358-677'  
**TOP OF SALADO:** 677'  
**MARKER BED 124:** 1477-1486'

**PLUGGING SCHEDULE:**      From: 1591'  
To: 0'  
Int: 1591'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached



## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-1	Holocene Deposits	0-10
	Pleistocene Rocks	
	Gatuna Formation	10-40
	Permian Rocks	
	Dewey Lake Red Beds	40-358
	Rustler Formation	358-677
	Magenta Dolomite Member	423-448
	Culebra Dolomite Member	538-565
	Salado Formation	677-1591
	Upper Member	677-1191
	McNutt Potash Zone	1191-1583
	Vaca Triste Sandstone Member	1191-1201
	11th Ore Zone	1246-1250
	MB 117	1259-1262
	MB 118	1282-1285
	MB 119	1307-1309
	10th Ore Zone	1319-1324
	MB 120	1334-1335
	9th Ore Zone	1338-1343
	MB 121	1347-1349
	MB 122	1356-1357
	8th Ore Zone	1361-1370
	Union Anhydrite	1381-1393
	7th Ore Zone	1400-1404
	6th Ore Zone	1414-1416
	5th Ore Zone	1419-1432
	MB 123	1462-1469
	MB 124	1477-1486
	4th Ore Zone	1490-1503
	3d Ore Zone	1511-1526
	2d Ore Zone	1533-1538
	1st Ore Zone	1554-1562
	MB 126	1582-1583
	Lower Member	1583-1587

## POTASH BOREHOLE DATA BASE

---

**BOREHOLE:** P-2  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 125' FNL, 172' FEL of Sec. 28, NE1/4  
Sec. 28, T 22 S, R 31 E

**ELEVATION:** 3478'  
**TOTAL DEPTH:** 1895'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:** **Date Started:** 08/25/76 **Date Completed:** 09/02/76  
Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: All

**WATER HORIZONS:** Unknown  
**RUSTLER FORMATION:** 690-1008'  
**TOP OF SALADO:** 1008'  
**MARKER BED 124:** 1787-1795'

**PLUGGING SCHEDULE:** From: 1895'  
To: 0'  
Int: 1895'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-2	Holocene Deposits	0-18
	Pleistocene Rocks	
	Gatuna Formation	18-38
	Triassic Rocks	
	Santa Rosa Sandstone	38-164
	Permian Rocks	
	Dewey Lake Red Beds	164-690
	Rustler Formation	690-1008
	Magenta Dolomite Member	748-773
	Culebra Dolomite Member	857-883
	Salado Formation	1008-1895
	Upper Member	1008-1506
	McNutt Potash Zone	1506-1883
	Vaca Triste Sandstone Member	1506-1512
	11th Ore Zone	1562-1565
	MB 117	1574-1576
	MB 118	1599-1601
	MB 119	1622-1626
	10th Ore Zone	1632-1639
	MB 120	1646-1647
	9th Ore Zone	1652-1656
	MB 121	1662-1663
	MB 122	1670-1671
	8th Ore Zone	1678-1687
	Union Anhydrite	1695-1705
	7th Ore Zone	1712-1719
	6th Ore Zone	1731-1733
	5th Ore Zone	1738-1745
	MB 123	1774-1781
	MB 124	1787-1795
	4th Ore Zone	1799-1809
	3d Ore Zone	1818-1832
	2d Ore Zone	1836-1840
	1st Ore Zone	1859-1870
	MB 126	1882-1883
	Lower Member	1883-1894

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-3  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 103' FSL, 3122' FEL of Sec. 20, SW1/4  
Sec. 20, T 22 S, R 31 E

**ELEVATION:** 3382'  
**TOTAL DEPTH:** 1676'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Pennsylvania Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:**      **Date Started:** 08/26/76      **Date Completed:** 09/07/76

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: 336' of casing left  
in hole between 490-826' below  
land surface.

**WATER HORIZONS:** Unknown  
**RUSTLER FORMATION:** 468-786'  
**TOP OF SALADO:** 786'  
**MARKER BED 124:** 1571-1579'

**PLUGGING SCHEDULE:** From: 1676'  
To: 0'  
Int: 1676'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-3	Holocene Deposits	0-10
	Pleistocene rocks	
	Gatuna Formation	10-41
	Permian Rocks	
	Dewey Lake Red Beds	41-468
	Rustler Formation	468-786
	Magenta Dolomite Member	529-553
	Culebra Dolomite Member	642-665
	Salado Formation	786-1668
	Upper Member	786-1287
	McNutt Potash Zone	1287-1668
	Vaca Triste Sandstone Member	1287-1295
	11th Ore Zone	1346-1349
	MB 117	1357-1358
	MB 118	1375-1378
	MB 119	1405-1407
	10th Ore Zone	1415-1420
	MB 120	1428-1429
	9th Ore Zone	1434-1438
	MB 121	1443-1445
	MB 122	1452-1453
	8th Ore Zone	1458-1467
	Union Anhydrite	1473-1481
	7th Ore Zone	1494-1499
	6th Ore Zone	1509-1511
	5th Ore Zone	1515-1525
	MB 123	1555-1563
	MB 124	1571-1579
	4th Ore Zone	1585-1595
	3d Ore Zone	1599-1617
	2d Ore Zone	1623-1627
	1st Ore Zone	1645-1656
	MB 126	1667-1668

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-4  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 146' FSL, 1487' FEL of Sec. 28, SE1/4  
Sec. 28, T 22 S, R 31 E

**ELEVATION:** 3441'  
**TOTAL DEPTH:** 1857'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:**      **Date Started:** 08/28/76      **Date Completed:** 09/04/76

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: All

**WATER HORIZONS:** Driller reported water at 850'.  
**RUSTLER FORMATION:** 609-930'  
**TOP OF SALADO:** 930'  
**MARKER BED 124:** 1742-1752'

**PLUGGING SCHEDULE:** From: 1857'  
To: 0'  
Int: 1857'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-4	Holocene Deposits	0-8
	Triassic Rocks	
	Santa Rosa Sandstone	8-99
	Permian Rocks	
	Dewey Lake Red Beds	99-609
	Rustler Formation	609-930
	Magenta Dolomite Member	662-686
	Culebra Dolomite Member	775-802
	Salado Formation	930-1857
	Upper Member	930-1446
	McNutt Potash Zone	1446-1853
	Vaca Triste Sandstone Member	1446-1452
	11th Ore Zone	1506-1509
	MB 117	1519-1521
	MB 118	1544-1547
	MB 119	1570-1572
	10th Ore Zone	1581-1589
	MB 120	1596-1597
	9th Ore Zone	1603-1607
	MB 121	1610-1612
	MB 122	1620-1621
	8th Ore Zone	1628-1637
	Union Anhydrite	1646-1659
	7th Ore Zone	1667-1671
	6th Ore Zone	1683-1686
	5th Ore Zone	1690-1700
	MB 123	1728-1735
	MB 124	1742-1752
	4th Ore Zone	1756-1768
	3d Ore Zone	1777-1792
	2d Ore Zone	1798-1803
	1st Ore Zone	1824-1835
	MB 126	1852-1853

## POTASH BOREHOLE DATA BASE

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**BOREHOLE:** P-5  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 202' FSL, 165' FEL of Sec. 17, SE1/4  
Sec. 17, T 22 S, R 31 E

**ELEVATION:** 3472'  
**TOTAL DEPTH:** 1830'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Pennsylvania Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:**      **Date Started:** 09/10/76      **Date Completed:** 09/21/76

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: 568' of casing left  
in hole between 435-1003'  
below land surface.

**WATER HORIZONS:** Unknown  
**RUSTLER FORMATION:** 623-947'  
**TOP OF SALADO:** 947'  
**MARKER BED 124:** 1695-1705'

**PLUGGING SCHEDULE:** From: 1830'  
To: 0'  
Int: 1830'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached



## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-5	Holocene deposits	0-13
	Triassic Rocks	
	Santa Rosa Sandstone	13-146
	Permian Rocks	
	Dewey Lake Red Beds	146-623
	Rustler Formation	623-947
	Magenta Dolomite Member	686-711
	Culebra Dolomite Member	804-827
	Salado Formation	947-1830
	Upper Member	947-1429
	McNutt Potash Zone	1429-1785
	Vaca Triste Sandstone Member	1429-1436
	11th Ore Zone	1482-1486
	MB 117	1492-1494
	MB 118	1514-1517
	MB 119	1541-1543
	10th Ore Zone	1550-1556
	MB 120	1560-1561
	9th Ore Zone	1567-1571
	MB 121	1573-1575
	MB 122	1580-1582
	8th Ore Zone	1589-1595
	Union Anhydrite	1604-1611
	7th Ore Zone	1623-1628
	6th Ore Zone	1635-1638
	5th Ore Zone	1643-1659
	MB 123	1680-1687
	MB 124	1695-1705
	4th Ore Zone	1709-1717
	3d Ore Zone	1725-1737
	1st Ore Zone	1742-1746
	MB 126	1784-1785
	Lower Member	1785-1830
	MB 127	1810-1811
	MB 128	1821-1822

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-6  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 2767' FSL, 199' FWL of Sec. 30, NW1/4  
Sec. 30, T 22 S, R 31 E

**ELEVATION:** 3354'  
**TOTAL DEPTH:** 1573'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:** **Date Started:** 09/03/76 **Date Completed:** 09/16/76  
Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: All

**WATER HORIZONS:** Unknown  
**RUSTLER FORMATION:** 357-659'  
**TOP OF SALADO:** 659'  
**MARKER BED 124:** 1453-1462'

**PLUGGING SCHEDULE:** From: 1573'  
To: 0'  
Int: 1573'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-6	Holocene Deposits	0-8
	Pleistocene Rocks	
	Gatuna Formation	8-18
	Permian Rocks	
	Dewey Lake Red Beds	18-357
	Rustler Formation	357-659
	Magenta Dolomite Member	417-443
	Culebra Dolomite Member	537-560
	Salado Formation	659-1573
	Upper Member	659-1162
	McNutt Potash Zone	1162-1560
	Vaca Triste Sandstone Member	1162-1170
	11th Ore Zone	1218-1221
	MB 117	1231-1233
	MB 118	1252-1256
	MB 119	1279-1281
	10th Ore Zone	1291-1296
	MB 120	1307-1308
	9th Ore Zone	1313-1317
	MB 121	1324-1326
	MB 122	1332-1333
	8th Ore Zone	1338-1348
	Union Anhydrite	1357-1365
	7th Ore Zone	1378-1382
	6th Ore Zone	1394-1396
	5th Ore Zone	1400-1410
	MB 123	1436-1443
	MB 124	1453-1462
	4th Ore Zone	1468-1481
	3d Ore Zone	1489-1502
	2d Ore Zone	1509-1513
	1st Ore Zone	1533-1543
	MB 126	1559-1560

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-7  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 513' FNL, 396' FWL of Sec. 5, NW1/4  
Sec. 5, T 23 S, R 31 E

**ELEVATION:** 3332'  
**TOTAL DEPTH:** 1574'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Pennsylvania Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:**      **Date Started:** 09/04/76      **Date Completed:** 09/21/76

Remarks: Encountered air pocket at 980' below land surface, and lost casing seat.  
Encountered several air pockets between 980-1264'. Lost mud at 1234'.

Conventional Rotary Drilling procedures were used to bore to the top of the  
potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the  
full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: 210' of casing left  
in hole between 530-740' below  
land surface.

**WATER HORIZONS:** Unknown  
**RUSTLER FORMATION:** 312-630'  
**TOP OF SALADO:** 630'  
**MARKER BED 124:** 1448-1459'

**PLUGGING SCHEDULE:** From: 1830'  
To: 0'  
Int: 1830'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-7	Holocene Deposits	0-11
	Pleistocene Rocks	
	Gatuna Formation	11-45
	Permian Rocks	
	Dewey Lake Red Beds	45-312
	Rustler Formation	312-630
	Magenta Dolomite Member	373-398
	Culebra Dolomite Member	496-522
	Salado Formation	630-1574
	Upper Member	630-1155
	McNutt Potash Zone	1155-1566
	Vaca Triste Sandstone Member	1155-1162
	11th Ore Zone	1215-1220
	MB 117	1228-1230
	MB 118	1252-1256
	MB 119	1277-1279
	10th Ore Zone	1291-1296
	MB 120	1307-1308
	9th Ore Zone	1312-1316
	MB 121	1326-1328
	MB 122	1330-1331
	8th Ore Zone	1335-1346
	Union Anhydrite	1358-1372
	7th Ore Zone	1377-1382
	6th Ore Zone	1391-1393
	5th Ore Zone	1398-1407
	MB 123	1433-1441
	MB 124	1448-1459
	4th Ore Zone	1467-1484
	3d Ore Zone	1492-1507
	2d Ore Zone	1513-1518
	1st Ore Zone	1537-1547
	MB 126	1565-1566

## POTASH BOREHOLE DATA BASE

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**BOREHOLE:** P-8  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 642' FNL, 96' FWL of Sec. 4, NW1/4  
Sec. 4, T 23 S, R 31 E

**ELEVATION:** 3336'  
**TOTAL DEPTH:** 1660'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:**      **Date Started:** 09/08/76      **Date Completed:** 09/15/76

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:**      4-1/2" Casing: Unknown  
Recovered: All

**WATER HORIZONS:** No water reported by driller.  
**RUSTLER FORMATION:** 391-715'  
**TOP OF SALADO:** 715'  
**MARKER BED 124:** 1537-1545'

**PLUGGING SCHEDULE:** From: 1660'  
To: 0'  
Int: 1660'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>P-8</b>	Holocene Deposits	0-9
	Pleistocene Rocks	
	Gatuna Formation	9-39
	Permian Rocks	
	Dewey Lake Red Beds	39-391
	Rustler Formation	391-715
	Magenta Dolomite Member	450-474
	Culebra Dolomite Member	563-585
	Salado Formation	715-1660
	Upper Member	715-1237
	McNutt Potash Zone	1237-1652
	Vaca Triste Sandstone Member	1237-1245
	11th Ore Zone	1297-1301
	MB 117	1308-1310
	MB 118	1333-1337
	MB 119	1360-1362
	10th Ore Zone	1373-1380
	MB 120	1389-1390
	9th Ore Zone	1395-1399
	MB 121	1405-1407
	MB 122	1413-1414
	8th Ore Zone	1421-1430
	Union Anhydrite	1440-1455
	7th Ore Zone	1461-1465
	6th Ore Zone	1472-1475
	5th Ore Zone	1481-1492
	MB 123	1517-1524
	MB 124	1537-1545
	4th Ore Zone	1554-1567
	3d Ore Zone	1577-1596
	2d Ore Zone	1601-1604
	1st Ore Zone	1624-1633
	MB 126	1661-1662

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-9  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 1493' FSL, 143' FEL of Sec. 33, SE1/4  
Sec. 33, T 22 S, R 31 E

**ELEVATION:** 3409'  
**TOTAL DEPTH:** 1796'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:** **Date Started:** 09/16/76 **Date Completed:** 09/25/76

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: All

**WATER HORIZONS:** Driller reported water at 220' below land surface, making about 25 gpm.  
**RUSTLER FORMATION:** 562-881'  
**TOP OF SALADO:** 881'  
**MARKER BED 124:** 1686-1695'

**PLUGGING SCHEDULE:** From: 1796'  
To: 0'  
Int: 1796'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached



## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-9	Holocene Deposit	0-11
	Triassic Rocks	
	Santa Rosa Sandstone	11-66
	Permian Rocks	
	Dewey Lake Red Beds	66-562
	Rustler Formation	562-881
	Magenta Dolomite Member	617-644
	Culebra Dolomite Member	734-757
	Salado Formation	881-1796
	Upper Member	881-1401
	McNutt Potash Zone	1401-1796
	Vaca Triste Sandstone Member	1401-1410
	11th Ore Zone	1458-1462
	MB 117	1471-1473
	MB 118	1496-1499
	MB 119	1519-1521
	10th Ore Zone	1530-1538
	MB 120	1546-1547
	9th Ore Zone	1552-1555
	MB 121	1561-1563
	MB 122	1569-1570
	8th Ore Zone	1577-1585
	Union Anhydrite	1597-1608
	7th Ore Zone	1613-1618
	6th Ore Zone	1626-1629
	5th Ore Zone	1634-1643
	MB 123	1668-1676
	MB 124	1686-1695
	4th Ore Zone	1699-1714
	3d Ore Zone	1723-1738
	2d Ore Zone	1744-1748
	1st Ore Zone	1769-1778
	MB 126	1795-1796

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-10  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 2315' FNL, 339' FWL of Sec. 26, NW1/4  
Sec. 26, T 22 S, R 31 E

**ELEVATION:** 3508'  
**TOTAL DEPTH:** 2009'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Pennsylvania Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:** **Date Started:** 09/24/76 **Date Completed:** 10/15/76  
Conventional Rotary Drilling procedures were used to bore to the top of the  
potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the  
full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: All

**WATER HORIZONS:** Unknown  
**RUSTLER FORMATION:** 686-1086'  
**TOP OF SALADO:** 1086'  
**MARKER BED 124:** 1880-1888'

**PLUGGING SCHEDULE:** From: 2009'  
To: 0'  
Int: 2009'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-10	Holocene Deposits	0-8
	Triassic Rocks	
	Santa Rosa Sandstone	8-151
	Permian Rocks	
	Dewey Lake Red Beds	151-686
	Rustler Formation	686-1086
	Magenta Dolomite Member	757-781
	Culebra Dolomite Member	931-957
	Salado Formation	1086-2009
	Upper Member	1086-1594
	McNutt Potash Zone	1594-1983
	Vaca Triste Sandstone Member	1594-1603
	11th Ore Zone	1652-1655
	MB 117	1662-1664
	MB 118	1686-1688
	MB 119	1710-1712
	10th Ore Zone	1717-1725
	MB 120	1733-1734
	9th Ore Zone	1740-1744
	MB 121	1751-1753
	MB 122	1759-1760
	8th Ore Zone	1765-1775
	Union Anhydrite	1784-1798
	7th Ore Zone	1807-1811
	6th Ore Zone	1822-1825
	5th Ore Zone	1831-1841
	MB 123	1868-1875
	MB 124	1880-1888
	4th Ore Zone	1892-1905
	3d Ore Zone	1913-1929
	2d Ore Zone	1934-1938
	1st Ore Zone	1961-1969
	MB 126	1982-1983
	Lower Member	1983-2009
	MB 127	2005-2008

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-11  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 175' FNL and 177' FWL of Sec. 23, NW1/4  
Sec. 23, T 22 S, R 31 E

**ELEVATION:** 3506'  
**TOTAL DEPTH:** 1940'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Pennsylvania Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:**      **Date Started:** 09/24/76      **Date Completed:** 10/16/76

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: All

**WATER HORIZONS:** Unknown  
**RUSTLER FORMATION:** 745-1058'  
**TOP OF SALADO:** 1058'  
**MARKER BED 124:** 1824-1833'

**PLUGGING SCHEDULE:** From: 1940'  
To: 0'  
Int: 1940'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-11	Holocene Deposits	0-9
	Triassic Rocks	
	Santa Rosa Sandstone	9-224
	Permian Rocks	
	Dewey Lake Red Beds	224-745
	Rustler Formation	745-1058
	Magenta Dolomite Member	798-823
	Culebra Dolomite Member	912-938
	Salado Formation	1058-1942
	Upper Member	1058-1550
	McNutt Potash Zone	1550-1917
	Vaca Triste Sandstone Member	1550-1557
	11th Ore Zone	1604-1608
	MB 117	1616-1618
	MB 118	1640-1642
	MB 119	1664-1666
	10th Ore Zone	1674-1682
	MB 120	1687-1688
	9th Ore Zone	1693-1698
	MB 121	1702-1704
	MB 122	1711-1712
	8th Ore Zone	1717-1724
	Union Anhydrite	1735-1740
	7th Ore Zone	1754-1759
	6th Ore Zone	1767-1770
	5th Ore Zone	1775-1785
	MB 123	1811-1818
	MB 124	1824-1833
	4th Ore Zone	1837-1846
	3d Ore Zone	1853-1866
	2d Ore Zone	1871-1874
	1st Ore Zone	1890-1901
	MB 126	1916-1917
	Lower Member	1917-1942
	MB 127	1940-1941

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-12  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 167' FNL, 195' FEL of Sec. 24, NE1/4  
Sec. 24, T 22 S, R 30 E

**ELEVATION:** 3376'  
**TOTAL DEPTH:** 1598'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Pennsylvania Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:**      **Date Started:** 09/17/76      **Date Completed:** 10/20/76

Remarks: Lost circulation at 742' and 813' below land.

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: All

**WATER HORIZONS:** Unknown  
**RUSTLER FORMATION:** 461-749'  
**TOP OF SALADO:** 749'  
**MARKER BED 124:** 1494-1509'

**PLUGGING SCHEDULE:** From: 1598'  
To: 0'  
Int: 1598'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>P-12</b>	Holocene Deposits	0-8
	Permian Rocks	
	Dewey Lake Red Beds	8-461
	Rustler Formation	461-749
	Magenta Dolomite Member	519-543
	Culebra Dolomite Member	633-656
	Salado Formation	749-1598
	Upper Member	749-1226
	McNutt Potash Zone	1226-1597
	Vaca Triste Sandstone Member	1226-1233
	11th Ore Zone	1280-1284
	MB 117	1290-1292
	MB 118	1314-1317
	MB 119	1338-1340
	10th Ore Zone	1346-1353
	MB 120	1361-1362
	9th Ore Zone	1367-1370
	MB 121	1376-1378
	MB 122	1384-1385
	8th Ore Zone	1390-1398
	Union Anhydrite	1407-1417
	7th Ore Zone	1432-1436
	6th Ore Zone	1442-1445
	5th Ore Zone	1450-1459
	MB 123	1486-1492
	MB 124	1494-1509
	4th Ore Zone	1514-1523
	3d Ore Zone	1533-1546
	2d Ore Zone	1550-1555
	1st Ore Zone	1572-1582
	MB 126	1596-1597

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-13  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 125' FNL, 116' FWL of Sec. 18, NW1/4  
Sec. 18, T 22 S, R 31 E

**ELEVATION:** 3345'  
**TOTAL DEPTH:** 1576'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:** **Date Started:** 09/17/76 **Date Completed:** 09/23/76

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: All

**WATER HORIZONS:** Hit water at 630'.  
**RUSTLER FORMATION:** 427-721'  
**TOP OF SALADO:** 721'  
**MARKER BED 124:** 1462-1471'

**PLUGGING SCHEDULE:** From: 1576'  
To: 0'  
Int: 1576'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached



## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-13	Holocene Deposits	0-12
	Pleistocene Rocks	
	Gatuna Formation	12-38
	Permian Rocks	
	Dewey Lake Red Beds	38-427
	Rustler Formation	427-721
	Magenta Dolomite Member	490-514
	Culebra Dolomite Member	604-627
	Salado Formation	721-1573
	Upper Member	721-1201
	McNutt Potash Zone	1201-1547
	Vaca Triste Sandstone Member	1201-1208
	11th Ore Zone	1252-1255
	MB 117	1264-1265
	MB 118	1287-1289
	MB 119	1309-1311
	10th Ore Zone	1317-1323
	MB 120	1330-1331
	9th Ore Zone	1336-1340
	MB 121	1344-1346
	MB 122	1355-1356
	8th Ore Zone	1359-1368
	Union Anhydrite	1377-1382
	7th Ore Zone	1395-1400
	6th Ore Zone	1407-1410
	5th Ore Zone	1413-1423
	MB 123	1447-1453
	MB 124	1462-1471
	4th Ore Zone	1474-1483
	3d Ore Zone	1491-1501
	2d Ore Zone	1506-1510
	1st Ore Zone	1525-1533
	MB 126	1547-1548
	Lower Member	1548-1573
	MB 127	1572-1573

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-14  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 307' FSL, 615.8' FWL of Sec. 24, SW1/4  
Sec. 24, T 22 S, R 30 E

**ELEVATION:** 3358'  
**TOTAL DEPTH:** 1545'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:** **Date Started:** 09/24/76 **Date Completed:** 10/03/76

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: All

**WATER HORIZONS:** Hit water at 589'.  
**RUSTLER FORMATION:** 387-687'  
**TOP OF SALADO:** 687'  
**MARKER BED 124:** 1410-1419'

**PLUGGING SCHEDULE:** From: 1545'  
To: 775'  
Int: 770'  
Material: Cement

From: 775'  
To: 0'  
Int: 775'  
Material: Well

Note: Hole plugged from 1545'-775' with cement and converted to hydrologic observation well in Rustler Formation.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-14	Holocene Deposits	0-10
	Pleistocene Rocks	
	Gatuna Formation	10-42
	Permian Rocks	
	Dewey Lake Red Beds	42-387
	Rustler Formation	387-687
	Magenta Dolomite Member	453-475
	Culebra Dolomite Member	573-595
	Salado Formation	687-1540
	Upper Member	687-1133
	McNutt Potash Zone	1133-1510
	Vaca Triste Sandstone Member	1133-1141
	11th Ore Zone	1186-1190
	MB 117	1199-1200
	MB 118	1225-1228
	MB 119	1251-1253
	10th Ore Zone	1257-1263
	MB 120	1273-1274
	9th Ore Zone	1277-1282
	MB 121	1287-1289
	MB 122	1297-1298
	8th Ore Zone	1302-1310
	Union Anhydrite	1319-1328
	7th Ore Zone	1342-1345
	6th Ore Zone	1352-1355
	5th Ore Zone	1361-1370
	MB 123	1394-1400
	MB 124	1410-1419
	4th Ore Zone	1423-1435
	3d Ore Zone	1443-1455
	2d Ore Zone	1461-1465
	1st Ore Zone	1482-1492
	MB 126	1509-1510
	Lower Member	1510-1540
	MB 127	1534-1536

## POTASH BOREHOLE DATA BASE

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**BOREHOLE:** P-15  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 410.8' FSL, 192.32' FWL of Sec. 21, SW1/4  
Sec. 31, T 22 S, R 31 E

**ELEVATION:** 3309.7'  
**TOTAL DEPTH:** 1465'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:** **Date Started:** 10/04/76 **Date Completed:** 10/14/76

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2": Casing Unknown  
Recovered: 210' of casing left  
in hole between 530-740' below  
land surface.

**WATER HORIZONS:**  
**RUSTLER FORMATION:**  
**TOP OF SALADO:**  
**MARKER BED 124:**

**PLUGGING SCHEDULE:** From: 1465'  
To: 620'  
Int: 845'  
Material: Cement

From: 620'  
To: 0'  
Int: 620'  
Material: Well

Note: Hole plugged from 1465'-620' with cement, and converted to hydrologic observation well in Rustler Formation.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-15	Holocene Deposits	0-11
	Pleistocene Rocks	
	Gatuna Formation	11-32
	Permian Rocks	
	Dewey Lake Red Beds	32-231
	Rustler Formation	231-542
	Magenta Dolomite Member	294-321
	Culebra Dolomite Member	413-435
	Salado Formation	542-1465
	Upper Member	542-1057
	McNutt Potash Zone	1057-1453
	Vaca Triste Sandstone Member	1057-1065
	11th Ore Zone	1116-1119
	MB 117	1128-1130
	MB 118	1149-1152
	MB 119	1176-1178
	10th Ore Zone	1187-1195
	MB 120	1203-1204
	9th Ore Zone	1208-1212
	MB 121	1216-1218
	MB 122	1225-1226
	8th Ore Zone	1234-1244
	Union Anhydrite	1251-1263
	7th Ore Zone	1271-1275
	6th Ore Zone	1284-1288
	5th Ore Zone	1292-1301
	MB 123	1326-1333
	MB 124	1343-1353
	4th Ore Zone	1361-1376
	3d Ore Zone	1384-1397
	2d Ore Zone	1404-1408
	1st Ore Zone	1426-1436
	MB 126	1452-1453

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-16  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 951' FSL, 1629' FEL of Sec. 5, SW1/4  
Sec. 5, T 23S, R 31E

**ELEVATION:** 3323'  
**TOTAL DEPTH:** 1585'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:**      **Date Started:** 09/27/76      **Date Completed:** 10/05/76

Conventional Rotary Drilling procedures were used to bore to the top of the potash bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: All

**WATER HORIZONS:** Unknown  
**RUSTLER FORMATION:** 316-646'  
**TOP OF SALADO:** 646'  
**MARKER BED 124:** 1460-1470"

**PLUGGING SCHEDULE:** From: 1585'  
To: 0'  
Int: 1585'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-16	Holocene Deposits	0-14
	Pleistocene Rocks	
	Gatuna Formation	14-32
	Permian Rocks	
	Dewey Lake Red Beds	32-316
	Rustler Formation	316-646
	Magenta Dolomite Member	376-401
	Culebra Dolomite Member	500-523
	Salado Formation	646-1587
	Upper Member	646-1174
	McNutt Potash Zone	1174-1585
	Vaca Triste Sandstone Member	1174-1182
	11th Ore Zone	1235-1237
	MB 117	1245-1247
	MB 118	1269-1273
	MB 119	1293-1295
	10th Ore Zone	1307-1313
	MB 120	1323-1324
	9th Ore Zone	1328-1331
	MB 121	1336-1338
	MB 122	1345-1346
	8th Ore Zone	1352-1365
	Union Anhydrite	1373-1390
	7th Ore Zone	1396-1400
	6th Ore Zone	1411-1412
	5th Ore Zone	1417-1425
	MB 123	1450-1456
	MB 124	1460-1470
	4th Ore Zone	1480-1501
	3d Ore Zone	1510-1526
	2d Ore Zone	1533-1536
	1st Ore Zone	1556-1568
	MB 126	1583-1585

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-17  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 1372.2' FSL, 401.9' FWL of Sec. 4, SW1/4  
Sec. 4, T 23 S, R 31 E

**ELEVATION:** 3340'  
**TOTAL DEPTH:** 1660'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:** **Date Started:** 10/18/76 **Date Completed:** 10/26/76

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: Unknown

**WATER HORIZONS:** Hit water at 265' and at 600'.  
**RUSTLER FORMATION:** 382-715'  
**TOP OF SALADO:** 715'  
**MARKER BED 124:** 1527-1535'

**PLUGGING SCHEDULE:** From: 1660'  
To: 731'  
Int: 929'  
Material: Cement

From: 731'  
To: 0'  
Int: 731'  
Material: Well

Note: Hole plugged from 1660'-731' with cement and converted to hydrologic observation well in Rustler Formation.

**STRATIGRAPHIC SUMMARY:** Attached



## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-17	Holocene Deposits	0-14
	Pleistocene Rocks	
	Gatuna Formation	14-46
	Permian Rocks	
	Dewey Lake Red Beds	46-382
	Rustler Formation	382-715
	Magenta Dolomite Member	438-463
	Culebra Dolomite Member	558-583
	Salado Formation	715-1662
	Upper Member	715-1234
	McNutt Potash Zone	1234-1648
	Vaca Triste Sandstone Member	1234-1242
	11th Ore Zone	1294-1299
	MB 117	1306-1308
	MB 118	1330-1334
	MB 119	1358-1359
	10th Ore Zone	1368-1376
	MB 120	1387-1388
	9th Ore Zone	1391-1396
	MB 121	1402-1404
	MB 122	1410-1411
	8th Ore Zone	1418-1428
	Union Anhydrite	1438-1453
	7th Ore Zone	1456-1461
	6th Ore Zone	1471-1474
	5th Ore Zone	1478-1487
	MB 123	1513-1521
	MB 124	1527-1535
	4th Ore Zone	1544-1563
	3d Ore Zone	1573-1587
	2d Ore Zone	1594-1599
	1st Ore Zone	1619-1630
	MB 126	1647-1648

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-18  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 138.5' FSL, 732.7' FEL of Sec. 26, SE1/4  
Sec. 26, T 22 S, R 31 E

**ELEVATION:** 3479'  
**TOTAL DEPTH:** 1998'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Pennsylvania Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:** **Date Started:** 10/19/76 **Date Completed:** 11/05/76

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: Unknown

**WATER HORIZONS:** Unknown  
**RUSTLER FORMATION:** 626-1088'  
**TOP OF SALADO:** 1088'  
**MARKER BED 124:** 1880-1889'

**PLUGGING SCHEDULE:** From: 1998'  
To: 1125'  
Int: 873'  
Material: Cement

From: 1125'  
To: 0'  
Int: 1125'  
Material: Well

Note: Hole plugged from 1998-1125' with cement, and converted to hydrologic observation well in Rustler Formation.

**STRATIGRAPHIC SUMMARY:** Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-18	Holocene Deposits	0-9
	Triassic Rocks	
	Santa Rosa Sandstone	9-87
	Permian Rocks	
	Dewey Lake Red Beds	87-626
	Rustler Formation	626-1088
	Magenta Dolomite Member	704-730
	Culebra Dolomite Member	909-938
	Salado Formation	1088-2000
	Upper Member	1088-1604
	McNutt Potash Zone	1604-1987
	Vaca Triste Sandstone Member	1604-1614
	11th Ore Zone	1658-1662
	MB 117	1670-1672
	MB 118	1692-1694
	MB 119	1716-1718
	10th Ore Zone	1726-1734
	MB 120	1741-1742
	9th Ore Zone	1749-1752
	MB 121	1756-1758
	MB 122	1765-1766
	8th Ore Zone	1772-1783
	Union Anhydrite	1793-1808
	7th Ore Zone	1812-1817
	6th Ore Zone	1828-1830
	5th Ore Zone	1835-1844
	MB 123	1868-1875
	MB 124	1880-1889
	4th Ore Zone	1897-1910
	3d Ore Zone	1919-1933
	2d Ore Zone	1938-1942
	1st Ore Zone	1961-1972
	MB 126	1986-1987

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-19  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 1652' FSL, 2330' FWL of Sec. 23, SW1/4  
Sec. 23, T 22 S, R 31 E

**ELEVATION:** 3546.3'  
**TOTAL DEPTH:** 2000'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Pennsylvania Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:**      **Date Started:** 10/19/76      **Date Completed:** 11/04/76

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:**      4-1/2" Casing: Unknown  
Recovered: All

**WATER HORIZONS:**  
**RUSTLER FORMATION:**  
**TOP OF SALADO:**  
**MARKER BED 124:**

**PLUGGING SCHEDULE:**      From: 2000'  
To: 0'  
Int: 2000'  
Material: Cement

**STRATIGRAPHIC SUMMARY:**      Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>P-19</b>	Holocene Deposits	0-8
	Triassic Rocks	
	Santa Rosa Sandstone	8-232
	Permian Rocks	
	Dewey Lake Red Beds	232-758
	Rustler Formation	758-1117
	Magenta Dolomite Member	814-839
	Culebra Dolomite Member	967-997
	Salado Formation	1117-2002
	Upper Member	1117-1621
	McNutt Potash Zone	1621-2011
	Vaca Triste Sandstone Member	1621-1628
	11th Ore Zone	1677-1681
	MB 117	1688-1690
	MB 118	1711-1713
	MB 119	1735-1737
	10th Ore Zone	1745-1753
	MB 120	1760-1761
	9th Ore Zone	1767-1771
	MB 121	1776-1778
	MB 122	1785-1786
	8th Ore Zone	1792-1801
	Union Anhydrite	1812-1822
	7th Ore Zone	1835-1840
	6th Ore Zone	1850-1854
	5th Ore Zone	1858-1872
	MB 123	1892-1901
	MB 124	1909-1917
	4th Ore Zone	1923-1933
	3d Ore Zone	1944-1955
	2d Ore Zone	1962-1967
	1st Ore Zone	1983-1994

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-20  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown  
**LOCATION:** 794' FSL, 103' FEL of Sec. 14, SE1/4  
Sec. 14, T 22 S, R 31 E  
**ELEVATION:** 3552.9'  
**TOTAL DEPTH:** 1995'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:**      **Date Started:** 10/06/76      **Date Completed:** 10/14/76

Remarks: Very weak air flow noted during logging operation on October 14, 1976. Air pocket escaped detection throughout coring operation.

Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:**      4-1/2" Casing: Unknown  
Recovered: All

**WATER HORIZONS:**  
**RUSTLER FORMATION:**  
**TOP OF SALADO:**  
**MARKER BED 124:**

**PLUGGING SCHEDULE:**      From: 1995'  
To: 0'  
Int: 1995'  
Material: Cement

**STRATIGRAPHIC SUMMARY:**      Attached

## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-20	Holocene Deposits	0-6
	Triassic Rocks	
	Santa Rosa Sandstone	6-261
	Permian Rocks	
	Dewey Lake Red Beds	261-780
	Rustler Formation	780-1103
	Magenta Dolomite Member	839-866
	Culebra Dolomite Member	953-979
	Salado Formation	1103-1996
	Upper Member	1103-1604
	McNutt Potash Zone	1604-1977
	Vaca Triste Sandstone Member	1604-1612
	11th Ore Zone	1658-1662
	MB 117	1671-1673
	MB 118	1696-1697
	MB 119	1720-1721
	10th Ore Zone	1728-1735
	MB 120	1742-1743
	9th Ore Zone	1747-1750
	MB 121	1756-1758
	MB 122	1764-1765
	8th Ore Zone	1771-1779
	Union Anhydrite	1789-1795
	7th Ore Zone	1807-1811
	6th Ore Zone	1821-1823
	5th Ore Zone	1828-1839
	MB 123	1866-1873
	MB 124	1880-1891
	4th Ore Zone	1893-1904
	3d Ore Zone	1911-1924
	2d Ore Zone	1928-1932
	1st Ore Zone	1947-1961
	MB 126	1975-1977
	Lower Member	1977-1996

**POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** P-21  
**OPERATOR:** U.S. Department of Energy  
**PERMIT NO.:** Unknown

**LOCATION:** 852' FNL, 150' FEL of Sec. 15, NE1/4  
Sec. 15, T 22 S, R 31 E

**ELEVATION:** 3510'  
**TOTAL DEPTH:** 1915'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company (for Sandia Laboratories)

**DRILLING RECORD:**      **Date Started:** 10/15/76      **Date Completed:** 10/26/76  
  
Conventional Rotary Drilling procedures were used to bore to the top of the potash-bearing section, and consecutive cores, 2-1/4" in diameter, were taken through the full thickness of the potash-bearing section.

**CASING RECORD:** 4-1/2" Casing: Unknown  
Recovered: All

**WATER HORIZONS:** Driller reported water between 525-595'.  
**RUSTLER FORMATION:** 734-1043'  
**TOP OF SALADO:** 1043'  
**MARKER BED 124:** 1796-1805'

**PLUGGING SCHEDULE:** From: 1915'  
To: 0'  
Int: 1915'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached



## STRATIGRAPHIC SUMMARY

BOREHOLE	ROCK UNIT	DEPTH INTERVAL IN FEET
P-21	Holocene Deposits	0-8
	Triassic Rocks	
	Santa Rosa Sandstone	8-225
	Permian Rocks	
	Dewey Lake Red Beds	225-734
	Rustler Formation	734-1043
	Magenta Dolomite Member	788-812
	Culebra Dolomite Member	899-924
	Salado Formation	1043-1918
	Upper Member	1043-1526
	McNutt Potash Zone	1526-1887
	Vaca Triste Sandstone Member	1526-1533
	11th Ore Zone	1579-1583
	MB 117	1591-1593
	MB 118	1615-1616
	MB 119	1637-1638
	10th Ore Zone	1647-1653
	MB 120	1659-1660
	9th Ore Zone	1665-1669
	MB 121	1676-1678
	MB 122	1685-1686
	8th Ore Zone	1690-1699
	Union Anhydrite	1707-1714
	7th Ore Zone	1727-1732
	6th Ore Zone	1740-1744
	5th Ore Zone	1748-1757
	MB 123	1781-1789
	MB 124	1796-1805
	4th Ore Zone	1811-1817
	3d Ore Zone	1824-1837
	2d Ore Zone	1841-1845
	1st Ore Zone	1859-1873
	MB 126	1886-1887
	Lower Member	1887-1918
	MB 127	1912-1913

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** I-374  
**OPERATOR:** International Minerals & Chemical Corp.  
**PERMIT NO.:** Potassium Prospecting Permit NM-0359163

**LOCATION:** 424' North 45 degrees West from S1/4  
Corner of Section 30, SW1/4 Section 30,  
Township 22 South, Range 31 East. NMPM

**ELEVATION:** 3340'  
**TOTAL DEPTH:** 1538'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company

**DRILLING RECORD:** **Date Started:** 04/15/65 **Date Completed:** 04/27/65  
Rotary Drill  
6-1/4" Rockbit: 0-714'  
3-7/8" Rockbit: 714-1149'  
3-7/8" Corebit: 1149-1538'

**CASING RECORD:** 4" Casing: 0-714'  
Recovered: 0-437'

**PLUGGING SCHEDULE:** From: 1538'  
To: 714'  
Int: 824'  
Material: Cement

From: 714'  
To: 470'  
Int: 244'  
Material: Cement

From: 470'  
To: 20'  
Int: 450'  
Material: Mud

From: 20'  
To: 0'  
Int: 20'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 360'  
Top of Salt: 690'  
Top of USGS 124 Bed: 1399'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

**BOREHOLE:** I-375  
**OPERATOR:** International Minerals & Chemical Corp.  
**PERMIT NO.:** Potassium Prospecting Permit NM-0359161

**LOCATION:** 144' South 24 degrees East from Northwest  
Corner of Section 33, NW1/4 Section 33,  
Township 22 South, Range 31 East. NMPM

**ELEVATION:** 3390'  
**TOTAL DEPTH:** 1746'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company

**DRILLING RECORD:**      **Date Started:** 04/28/65      **Date Completed:** 05/13/65  
Rotary Drill  
6-1/4" Rockbit: 0-520'  
3-7/8" Rockbit: 520-1300'  
3-7/8" Corebit: 1300-1746'

**CASING RECORD:** 4" Casing: 0-817'  
Recovered: 0-129'

**PLUGGING SCHEDULE:** From: 1746'  
To: 817'  
Int: 929'  
Material: Cement

From: 817'  
To: 510'  
Int: 307'  
Material: Cement

From: 510'  
To: 20'  
Int: 490'  
Material: Mud

From: 20'  
To: 0'  
Int: 20'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 470'  
Top of Salt: 790'  
Top of USGS 124 Bed: 1602'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

**BOREHOLE:** I-376  
**OPERATOR:** International Minerals & Chemical Corp.  
**PERMIT NO.:** Potassium Prospecting Permit NM-0384583

**LOCATION:** 400' South 75 degrees East from Northwest  
Corner of Section 20, NW1/4 Section 20,  
Township 22 South, Range 31 East. NMPM

**ELEVATION:** 3410'  
**TOTAL DEPTH:** 1702'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company

**DRILLING RECORD:** **Date Started:** 06/15/65 **Date Completed:** 06/23/65  
Rotary Drill  
6-1/4" Rockbit: 0-840'  
3-7/8" Rockbit: 840-1328'  
3-7/8" Corebit: 1328-1702'

**CASING RECORD:** 4" Casing: 0-840'  
Recovered: 0-840'

**PLUGGING SCHEDULE:** From: 1702'  
To: 800'  
Int: 902'  
Material: Cement

From: 800'  
To: 720'  
Int: 80'  
Material: Mud

From: 720'  
To: 660'  
Int: 60'  
Material: Cement

From: 660'  
To: 540'  
Int: 120'  
Material: Mud

From: 540'  
To: 480'  
Int: 60'  
Material: Cement

From: 480'  
To: 30'  
Int: 450'  
Material: Mud

From: 30'  
To: 0'  
Int: 30'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 500'

## COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE

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Top of Salt: 840'

Top of USGS 124 Bed: 1581'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

**BOREHOLE:** I-377  
**OPERATOR:** International Minerals & Chemical Corp.  
**PERMIT NO.:** Potassium Prospecting Permit NM-0384584

**LOCATION:** 105' South 48 degrees East from Northwest  
Corner of Section 22, NW1/4 Section 22,  
Township 22 South, Range 31 East. NMPM

**ELEVATION:** 3490'  
**TOTAL DEPTH:** 1876'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Co.

**DRILLING RECORD:**      **Date Started:** 06/26/65      **Date Completed:** 07/16/65  
Rotary Drill  
6-1/4" Rockbit: 0-996'  
3-7/8" Rockbit: 996-1530'

**CASING RECORD:**      4" Casing: 0-996'  
Recovered: 0-996'

**PLUGGING SCHEDULE:**      From: 1876'  
To: 996'  
Int: 880'  
Material: Cement

From: 996'  
To: 925'  
Int: 71'  
Material: Mud

From: 925'  
To: 885'  
Int: 40'  
Material: Cement

From: 885'  
To: 730'  
Int: 155'  
Material: Mud

From: 730'  
To: 700'  
Int: 30'  
Material: Cement

From: 700'  
To: 10'  
Int: 690'  
Material: Mud

From: 10'  
To: 0'  
Int: 10'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 700'  
Top of Salt: 1014'  
Top of USGS 124 Bed: 1770'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

**BOREHOLE:** I-383  
**OPERATOR:** International Minerals & Chemical Corp.  
**PERMIT NO.:** Potassium Prospecting Permit NM-0359160

**LOCATION:** 287' South 52 degrees East from W1/4  
Corner of Section 1, SW1/4 Section 1,  
Township 23 South, Range 30 East. NMPM

**ELEVATION:** 3272'  
**TOTAL DEPTH:** 1307'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company

**DRILLING RECORD:**      **Date Started:** 07/19/65      **Date Completed:** 08/26/65  
Rotary Drill  
6-1/4" Rockbit: 0-481'  
3-7/8" Rockbit: 481-1000'  
3-7/8" Corebit: 1000-1307'

**CASING RECORD:** 4" Casing: 0-481'  
Recovered: 0-105'

**PLUGGING SCHEDULE:** From: 1307'  
To: 481'  
Int: 826'  
Material: Cement

From: 481'  
To: 320'  
Int: 161'  
Material: Cement

From: 320'  
To: 210'  
Int: 110'  
Material: Mud

From: 210'  
To: 150'  
Int: 60'  
Material: Cement

From: 150'  
To: 15'  
Int: 135'  
Material: Mud

From: 15'  
To: 0'  
Int: 15'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 160'  
Top of Salt: 475'  
Top of USGS 124 Bed: 1211'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** I-456  
**OPERATOR:** International Minerals & Chemical Corp.  
**PERMIT NO.:** Potassium Prospecting Permit NM-0384584

**LOCATION:** 300' from South Line and 2650' from East  
Line of Section 22, SW 1/4 Section 22,  
Township 22 South, Range 31 East. NMPM

**ELEVATION:** 3520'  
**TOTAL DEPTH:** 1975'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company

**DRILLING RECORD:** **Date Started:** 06/22/76 **Date Completed:** 07/07/76  
Rotary Drill  
6-1/4" Rockbit: 0-940'  
3-7/8" Rockbit: 940-1580'  
3-7/8" Corebit: 1580-1975'

**CASING RECORD:** 4" Casing: Unknown  
Recovered: All

**PLUGGING SCHEDULE:** From: 1975'  
To: 0'  
Int: 1975'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 790'  
Top of Salt: 1080'  
Top of USGS 124 Bed: 1853'



**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

**BOREHOLE:** I-457  
**OPERATOR:** International Minerals & Chemical Corp.  
**PERMIT NO.:** Potassium Prospecting Permit NM-0384584

**LOCATION:** 200' from South Line and 1200' from West  
Line of Section 27, SW 1/4 Section 27  
Township 22 South, Range 31 East. NMPM

**ELEVATION:** 3460'  
**TOTAL DEPTH:** 1885'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company

**DRILLING RECORD:**      **Date Started:** 07/08/76      **Date Completed:** 07/22/76  
Rotary Drill  
6-1/4" Rockbit: 0-940'  
3-7/8" Rockbit: 940-1480'  
3-7/8" Corebit: 1480-1885'

**CASING RECORD:** 4" Casing: 0-980'  
Recovered: 0-980'

**PLUGGING SCHEDULE:** From: 1885'  
To: 0'  
Int: 1885'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 660'  
Top of Salt: 980'  
Top of USGS 124 Bed: 1777'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** I-458  
**OPERATOR:** International Minerals & Chemical Corp.  
**PERMIT NO.:** Potassium Prospecting Permit NM-0384584

**LOCATION:** 2500' from North Line and 400' from East  
Line of Section 4, NE1/4 Section 4,  
Township 23 South, Range 31 East. NMPM

**ELEVATION:** 3410'  
**TOTAL DEPTH:** 1750'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company

**DRILLING RECORD:** **Date Started:** 07/23/76 **Date Completed:** 08/09/76  
Rotary Drill  
6-1/4" Rockbit: 0-960'  
3-7/8" Rockbit: 960-1385'  
3-7/8" Corebit: 1385-1750'

**CASING RECORD:** 4" Casing: Unknown  
Recovered: All

**PLUGGING SCHEDULE:** From: 1750'  
To: 0'  
Int: 1750'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 580'  
Top of Salt: 970'  
Top of USGS 124 Bed: 1623'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** I-459  
**OPERATOR:** International Minerals & Chemical Corp.  
**PERMIT NO.:** Potassium Prospecting Permit NM-0384584

**LOCATION:** 2500' from North Line and 2000' from East  
Line of Section 3, NE1/4 Section 3,  
Township 23 South, Range 31 East. NMPM

**ELEVATION:** 3385'  
**TOTAL DEPTH:** 1855'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Boyles Bros. Drilling Company

**DRILLING RECORD:**      **Date Started:** 08/11/76      **Date Completed:** 08/24/76  
Rotary Drill  
6-1/4" Rockbit: 0-900'  
3-7/8" Rockbit: 900-1330'  
3-7/8" Corebit: 1330-1855'

**CASING RECORD:** 4" Casing: Unknown  
Recovered: All

**PLUGGING SCHEDULE:** From: 1855'  
To: 0'  
Int: 1885'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 580'  
Top of Salt: 940'  
Top of USGS 124 Bed: 1739'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** NFU-1  
**OPERATOR:** Farmers Educational and Cooperative Union of America  
**PERMIT NO.:** Potassium Prospecting Permit NM-065503

**LOCATION:** 100' from North Line and 100' from West  
Line of Section 9, NW1/4 Section 9,  
Township 22 South, Range 31 East. NMPM

**ELEVATION:** 3422'  
**TOTAL DEPTH:** 1747'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Weaver Drilling Company

**DRILLING RECORD:** **Date Started:** 12/19/50 **Date Completed:** 01/21/51  
Rotary Drill  
6-1/4" Rockbit: 0-944'

**CASING RECORD:** 4" Casing: 940'  
Recovered: 675'

**PLUGGING SCHEDULE:** 4 sacks cement at 1640'  
7 sacks cement at 955'  
7 sacks cement at 840'  
8 sacks cement at 740'

Could not pull 4" casing, but broke circulation around it before pumping in 7 sacks at 955'. Shot casing at 900', 700', and 675'. Recovered 675' of 940'. Filled hole with mud and placed 4" pipe marker.

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 635'  
Top of Salt: 935'  
Base of USGS 124 Bed: 1641'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

**BOREHOLE:** FC-70  
**OPERATOR:** Farm Chemical Resources Development Corporation  
**PERMIT NO.:** Potassium Prospecting Permit LC-065506

**LOCATION:** 177' from South Line and 177' from West  
Line of Section 7, NE1/4 Section 7,  
Township 22 South, Range 31 East. NMPM

**ELEVATION:** 3388'  
**TOTAL DEPTH:** 1603'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Joy Mfg. Company, Drilling Division

**DRILLING RECORD:**      **Date Started:** 09/26/56      **Date Completed:** 10/09/56  
Rotary Drill  
6-1/4" Rockbit: 0-902'  
Corebit: 902-1603'

**CASING RECORD:** 4-1/2" Casing: 902'  
Recovered: 902'

**PLUGGING SCHEDULE:** From: 1603'  
To: 1370'  
Int: 233'  
Material: Brine & Salt

From: 1370'  
To: 902'  
Int: 468'  
Material: Cement

From: 902'  
To: 10'  
Int: 892'  
Material: Mud

From: 10'  
To: 0'  
Int: 10'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 541'  
Top of Salt: 898'  
USGS 124 Bed: 1515'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** FC-82  
**OPERATOR:** Farm Chemical Resources Development Corporation  
**PERMIT NO.:** Potassium Prospecting Permit NM-057290

**LOCATION:** 154' from South Line and 37' from West  
Line of Section 8, Township 22 South,  
Range 31 East. NMPM

**ELEVATION:** 3382'  
**TOTAL DEPTH:** 1684'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 09/21/61 **Date Completed:** 10/03/61  
6-1/4" Rockbit: 0-922'  
Corebit: 922-1684'

**CASING RECORD:** 5-1/2" Casing: 922'  
Recovered: 922'

**PLUGGING SCHEDULE:** From: 1684'  
To: 922'  
Int: 762'  
Material: Cement

From: 922'  
To: 710'  
Int: 212'  
Material: Brine & Salt

From: 710'  
To: 510'  
Int: 200'  
Material: Cement

From: 510'  
To: 10'  
Int: 500'  
Material: Mud

From: 10'  
To: 0'  
Int: 10'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 538'  
Top of Salt: 910'  
USGS 124 Bed: 1593'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

**BOREHOLE:** FC-91  
**OPERATOR:** Farm Chemical Resources Development Corporation  
**PERMIT NO.:** Potassium Prospecting Permit NM-075014

**LOCATION:** 200' from South Line and 200' from West  
Line of Section 10, SW1/4, Township 22  
South, Range 31 East. NMPM

**ELEVATION:** 3460'  
**TOTAL DEPTH:** 1788'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 04/07/62 **Date Completed:** 04/17/62  
Rotary Drill  
Rockbit: 0-1070'  
Corebit: 1070-1788'

**CASING RECORD:** 4-1/4" Casing: 1070'  
Recovered: 1070'

**PLUGGING SCHEDULE:** From: 1788'  
To: 1060'  
Int: 728'  
Material: Cement

From: 1060'  
To: 840'  
Int: 220'  
Material: Cuttings & Brine

From: 840'  
To: 800'  
Int: 40'  
Material: Cement

From: 800'  
To: 10'  
Int: 790'  
Material: Cuttings & Brine

From: 10'  
To: 0'  
Int: 10'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 630'  
Top of Salt: 1070'  
Base of USGS 124 Bed: Unknown

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** FC-92  
**OPERATOR:** Farm Chemical Resources Development Corporation  
**PERMIT NO.:** Potassium Prospecting Permit NM-094314

**LOCATION:** 200' from South Line and 200' from East  
Line of Section 8, SE1/4, Township 22  
South, Range 31 East. NMPM

**ELEVATION:** 3420'  
**TOTAL DEPTH:** 1818'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 04/21/62 **Date Completed:** 05/03/62  
Rockbit: 0-1058'  
Corebit: 1058-1818'

**CASING RECORD:** 4-1/2" Casing: 1058'  
Recovered: 1058'

**PLUGGING SCHEDULE:** From: 1818'  
To: 945'  
Int: 873'  
Material: Cement

From: 945'  
To: 850'  
Int: 95'  
Material: Cuttings & Brine

From: 850'  
To: 810'  
Int: 40'  
Material: Cement

From: 810'  
To: 10'  
Int: 800'  
Material: Cuttings & Brine

From: 10'  
To: 0'  
Int: 10'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Rustler Formation: Unknown  
Top of Salt: 950'  
Base of USGS 124 Bed: Unknown



**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

**BOREHOLE:** D-104  
**OPERATOR:** Duval Sulphur & Potash Company  
**PERMIT NO.:** Potassium Prospecting Permit PPP-058761

**LOCATION:** 2585' from North Line and 1394' from East  
Line of Section 24, NE1/4 Section 24,  
Township 22 South, Range 30 East. NMPM

**ELEVATION:** 3388'  
**TOTAL DEPTH:** 1597'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Weaver Drilling Company

**DRILLING RECORD:**      **Date Started:** 09/25/52      **Date Completed:** 10/07/52  
Rotary Drill  
6-1/4" Rockbit: 0-759'  
Corebit: 759-1597'  
Lost Circulation: 730-747'

**CASING RECORD:** 4" Casing: Unknown  
Recovered: All

**PLUGGING SCHEDULE:** All casing was pulled and the following plugs run:  
1) 62 sacks mixed with brine and 3%  $\text{CaCl}_2$  at bottom of hole.  
2) 30 sacks mixed with fresh water bottomed at 660'.  
  
The remainder of the hole was filled with cuttings, a four-foot marker post set, and the hole abandoned.

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 520'  
Top of Salt: 759'  
Top of USGS 124 Bed: 1504'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** D-120  
**OPERATOR:** Duval Sulphur & Potash Company  
**PERMIT NO.:** Potassium Prospecting Permit PPP-058761

**LOCATION:** 1562' South and 1565' East of NW Corner  
Section 13, NW1/4 Section 13, Township 22  
South, Range 30 East. NMPM

**ELEVATION:** 3338'  
**TOTAL DEPTH:** 1500'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Weaver Drilling Company

**DRILLING RECORD:** **Date Started:** 02/14/53 **Date Completed:** 02/27/53  
Rotary Drill  
6-1/4" Rockbit: 0-704'  
3-13/16" Corebit: 704-1500'

**CASING RECORD:** 4" Casing: 704'  
Recovered: 704'

**PLUGGING SCHEDULE:** All casing was pulled and the following plugs run:  
1) 62 sacks of cement mixed with brine and 3%  $\text{CaCl}_2$  and brine at bottom of hole.  
2) 30 sacks of cement mixed with fresh water bottomed at 590'.

The remainder of the hole was filled with cuttings, a four-foot marker post set, and the hole abandoned.

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 330'  
Top of Salt: 684'  
Top of USGS 124 Bed: 1407'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** D-123  
**OPERATOR:** Duval Sulphur & Potash Company  
**PERMIT NO.:** Potassium Prospecting Permit LC-066112

**LOCATION:** 2614' North and 277' West of Southeast  
Corner of Section 34, NE1/4 Section 34,  
Township 22 South, Range 31 East. NMPM

**ELEVATION:** 3432'  
**TOTAL DEPTH:** 1880'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Weaver Drilling Company

**DRILLING RECORD:**      **Date Started:** 07/19/53      **Date Completed:** 08/07/53  
Rotary Drill  
6-1/4" Rockbit: 0-934'  
Corebit: 934-1880'

**CASING RECORD:** 4" Casing: 934'  
Recovered: 692'

**PLUGGING SCHEDULE:** Shot casing at 910' and 850'. Pulled 692' leaving 242' in hole. The following cement plugs were run:  
1) 73 sacks of cement mixed with 3% CaCl<sup>2</sup> and brine at bottom of hole.  
2) 45 sacks of cement mixed with fresh water bottomed at 880'.  
  
The remainder of the hole was filled with cuttings, a four-foot marker post set, and the hole abandoned.

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 670'  
Top of Salt: 988'  
Top of USGS 124 Bed: 1779'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** D-160  
**OPERATOR:** Duval Sulphur & Potash Company  
**PERMIT NO.:** Potassium Prospecting Permit M-2618

**LOCATION:** 2464' from South Line and 1117' from West  
Line of Section 36, SW1/4 Section 36,  
Township 22 South, Range 30 East. NMPM

**ELEVATION:** 3305'  
**TOTAL DEPTH:** 1354'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Weaver Drilling Company

**DRILLING RECORD:** **Date Started:** 07/21/54 **Date Completed:** 07/31/54  
Rotary Drill  
6-1/4" Rockbit: 0-596'  
Corebit: 596-1354'  
Encountering an air blow at 860'  
causing seat to leak.

**CASING RECORD:** 4" Casing: 596'  
Recovered: 596'

**PLUGGING SCHEDULE:** All casing was pulled and the following plugs run:  
1) 58 sacks of cement mixed with brine and 3%  $\text{CaCl}^2$  and brine at bottom of hole.  
2) 37 sacks of cement mixed with fresh water bottomed at 445'.  
  
The remainder of the hole was filled with cuttings, a four-foot marker post set, and the hole abandoned.

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 240'  
Top of Salt: 543'  
Top of USGS 124 Bed: 1301'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

**BOREHOLE:** D-207  
**OPERATOR:** Duval Sulphur & Potash Company  
**PERMIT NO.:** Potassium Prospecting Permit NM-08285

**LOCATION:** 1480' North and 1330' East of Southwest  
Corner of Section 19, SW1/4 Section 19  
Township 22 South, Range 31 East. NMPM

**ELEVATION:** 3406'  
**TOTAL DEPTH:** 1613'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Joy Drilling Company

**DRILLING RECORD:**      **Date Started:** 06/16/58      **Date Completed:** 07/03/58  
Rotary Drill  
6-1/4" Rockbit: 0-811'  
3-13/16" Corebit: 811-1613'

**CASING RECORD:**      4" Casing: 811'  
Recovered: 811'

**PLUGGING SCHEDULE:**      All casing was pulled and the following cement plugs were run:  
1) 66 sacks of cement mixed with 3%  $\text{CaCl}^2$  and brine at bottom of hole.  
2) 25 sacks of cement mixed with fresh water bottomed at 560'.

The remainder of the hole was filled with cuttings and soil, a four-foot marker post set,  
and the location left in good order.

**STRATIGRAPHIC SUMMARY:** Rustler Formation: 330'  
Top of Salt: 811'  
Top of USGS 124 Bed: 1519'

**COMMERCIALLY DRILLED POTASH BOREHOLE DATA BASE**

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**BOREHOLE:** D-235  
**OPERATOR:** Duval Sulphur & Potash Company  
**PERMIT NO.:** Potassium Prospecting Permit LC-062188

**LOCATION:** 2878' from South Line and 789' from West  
Line of Section 25, NW1/4 Section 25,  
Township 22 South, Range 30 East. NMPM

**ELEVATION:** 3336'  
**TOTAL DEPTH:** 1506'  
**TYPE OF WELL:** Potash Core Test  
**DRILLER:** Pennsylvania Drilling Company

**DRILLING RECORD:** **Date Started:** 10/11/77 **Date Completed:** 11/03/77  
Rotary Drill  
6-1/4" Rockbit: 0-689'  
3-7/8" Corebit: 689-1506'  
Encountering an air blow at 860'

**CASING RECORD:** 4" Casing: 689'  
Recovered: 400'

**PLUGGING SCHEDULE:** 400' of 4" casing was pulled. Pennsylvania Drilling Company then cemented the hole with 110 sacks of neat cement making a continuous plug from T.D. to surface. A four-foot marker post was then set and drill location was left in good order.

**STRATIGRAPHIC SUMMARY:** Rustler Formation: Unknown  
Top of Salt: 670'  
Top of USGS 124 Bed: 1390'

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-1  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499833.57, E666341.70

**ELEVATION:** 3412.48'  
**TOTAL DEPTH:** 58.2'  
**TYPE OF WELL:** Shallow Exploratory Drilling Converted to Observation Well 12/29/78  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/27/78      **Date Completed:** 12/29/78

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-1</b>	Silty Sand, Sand	0-9.5
	Caliche	9.5-14.5
	Gatuna	14.5-38
	(Santa Rosa) Sandstone	38-58.2



## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-1A  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499833.20, E666356.32

**ELEVATION:** 3412.48'  
**TOTAL DEPTH:** 12.9'  
**TYPE OF WELL:** Shallow Exploratory Drilling Converted to Observation Well 12/29/78  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/29/78      **Date Completed:** 12/29/78

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D, 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-1A</b>	Sand	0-11.2
	Caliche	11.2-12.9

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-2  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499835.35, E666841.60

**ELEVATION:** 3411.62'  
**TOTAL DEPTH:** 33.9'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 11/22/78      **Date Completed:** 11/29/78

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D, 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-2</b>	Sand	0-6.5
	Caliche	6.5-15.5
	Gatuna	15.5-23
	Siltstone	23-30.6
	Intercalated Sandstone and Soil	30.6-33.9

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-3  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499837.13, E667341.49

**ELEVATION:** 3415.33'

**TOTAL DEPTH:** 29'

**TYPE OF WELL:** Shallow Exploratory Drilling

**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/18/78      **Date Completed:** 12/18/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-3</b>	Sand	0-7.8
	Caliche	7.8-14
	Gatuna	14-24.2
	Siltstone	24.2-25
	Sandstone	25-28
	Siltstone	28-29

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-4  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499838.91, E667841.39

**ELEVATION:** 3417.08'  
**TOTAL DEPTH:** 38.8'  
**TYPE OF WELL:** Shallow Exploratory Drilling Converted to Observation Well 12/18/78  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/17/78      **Date Completed:** 12/18/78

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and wither air or water for drilling fluid.

**PLUGGING SCHEDULE:**

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-4</b>	Silty Sand	0-8.5
	Caliche	8.5-19
	Gatuna	19-37
	Claystone	37-38.8



## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-4A  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499837.97, E667829.91

**ELEVATION:** 3417.08'  
**TOTAL DEPTH:** 13.6'  
**TYPE OF WELL:** Shallow Exploratory Drilling Converted to Observation Well 12/19/78  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/19/78      **Date Completed:** 12/19/78

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds of downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-4A</b>	Silty Sand	0-11.5
	Caliche	11.5-13.6

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-5  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499840.69, E668341.29

**ELEVATION:** 3417.43'  
**TOTAL DEPTH:** 32.3'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/17/78      **Date Completed:** 12/17/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-5</b>	Silty Sand	0-8.2
	Caliche	8.2-17
	Gatuna	17-22.4
	Sandsone	22.4-26.9
	Intercalated Siltstone	26.9-32.3

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-6  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499842.47, E668841.15

**ELEVATION:** 3422.01'  
**TOTAL DEPTH:** 26.3'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/17/78      **Date Completed:** 12/17/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-6</b>	Silty Sand	0-3.5
	Caliche	3.5-10.1
	Gatuna	10.1-26.3

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-7  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499333.68, E666343.48

**ELEVATION:** 3404.19'  
**TOTAL DEPTH:** 34.9'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 11/21/78      **Date Completed:** 11/21/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-7</b>	Sand	0-5.5
	Caliche	5.5-20
	Gatuna	20-25
	Sandstone	25-27.5
	Santa Rosa	27.5-34.9



**SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-8  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499335.46, E666843.36

**ELEVATION:** 3408.55'  
**TOTAL DEPTH:** 100'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/03/79      **Date Completed:** 01/03/79

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-8</b>	Sand	0-7
	Caliche	7-12
	Gatuna	12-35.7
	Santa Rosa	35.7-40
	Dewey Lake	40-100

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-9  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499337.27, E667343.26

**ELEVATION:** 3410.47'  
**TOTAL DEPTH:** 38.3  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/19/78      **Date Completed:** 12/19/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test corings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-9</b>	Sand	0-8.1
	Caliche	8.1-18
	Gatuna	18-32.1
	Siltstone	32.1-36
	Sandstone	36-38.3

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-10  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499339.05, E6678434.11

**ELEVATION:** 3413'  
**TOTAL DEPTH:** 32'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/19/78      **Date Completed:** 12/19/78

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-10</b>	Sand	0-10.2
	Caliche	10.2-17
	Gatuna	17-26.5
	Siltstone	26.3-27
	Sandstone	27-32

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-11  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499340.83, E668343.05

**ELEVATION:** 3414.30'  
**TOTAL DEPTH:** 30'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/15/78      **Date Completed:** 12/15/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-11</b>	Sand	1.2-4.1
	Caliche	4.1-13.5
	Gatuna	13.5-30



**SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-12  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499342.61, E668842.93

**ELEVATION:** 3421.77'  
**TOTAL DEPTH:** 41.5'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/01/78      **Date Completed:** 12/01/78

**CASING RECORD:** Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-12</b>	Sand	0-6
	Caliche	6-13
	Gatuna	13-20
	Sandstone	20-26
	Claystone	26-27
	Sandstone	27-31.5
	Claystone	31.5-33.5
	Sandstone	33.5-38.5
	Intercalated Sandstone	38.5-41.5

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-13  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498833.82, E666345.25

**ELEVATION:** 3403.91'  
**TOTAL DEPTH:** 28.3'  
**TYPE OF WELL:** Shallow Exploratory Drilling Converted to Observation Well 12/16/78  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/12/78      **Date Completed:** 12/16/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-13</b>	Sand	0-7
	Caliche	7-12.5
	Gatuna	12.5-26
	Claystone	26-28.3

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-14  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498835.60, E666845.14

**ELEVATION:** 3406.57'  
**TOTAL DEPTH:** 24.5'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/13/78      **Date Completed:** 12/13/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-14</b>	Sand	0-4.8
	Caliche	4.8-9.9
	Gatuna	9.9-14
	Claystone	14-24.5

## SUBSURFACE EXPLORATION BOREHOLE DATA BASE

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**BOREHOLE:** B-15  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498837.40, E667345.06

**ELEVATION:** 3408.64'  
**TOTAL DEPTH:** 56.8'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 11/16/78      **Date Completed:** 11/17/78

**CASING RECORD:** Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-15</b>	Sand	0-9
	Caliche	9-13
	Silty Sand	13-26
	Gatuna	26-51.5
	Santa Rosa	51.5-55
	Shale	54.5-56.8



## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-16  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498839.19, E667844.94

**ELEVATION:** 3411.21'  
**TOTAL DEPTH:** 31'  
**TYPE OF WELL:** Shallow Exploratory Drilling Converted to Observation Well 12/15/78  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/14/78      **Date Completed:** 12/15/78

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-16</b>	Sand	0-7
	Caliche	7-15
	Gatuna	15-31

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-17  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498840.97, E668343.86

**ELEVATION:** 3413.26'  
**TOTAL DEPTH:** 25.8'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/13/78      **Date Completed:** 12/13/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-17</b>	Silty Sand	0-5.1
	Caliche	5.1-10.5
	Gatuna	10.5-25.8

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-18  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498842.75, E668844.75

**ELEVATION:** 3419.32'  
**TOTAL DEPTH:** 33.3'  
**TYPE OF WELL:** Shallow Exploratory Drilling Converted to Observation Well 12/15/78  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/14/78      **Date Completed:** 12/15/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-18</b>	Sand	0-7.1
	Caliche	7.1-15
	Gatuna	15-33.3

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-19  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498333.94, E666347.03

**ELEVATION:** 3399.84'  
**TOTAL DEPTH:** 38.8'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 11/30/78      **Date Completed:** 11/30/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-19</b>	Sand	0-8.5
	Caliche	8.5-18.5
	Gatuna	18.5-21.1
	Sandstone	21.1-38.8



## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-20  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498335.72, E666846.91

**ELEVATION:** 3403.53'  
**TOTAL DEPTH:** 14'  
**TYPE OF WELL:** Shallow Exploratory Drilling Converted to Observation Well 12/16/78  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/12/78      **Date Completed:** 12/16/78

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-20</b>	Sand Caliche	0-10 10-14

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-20A  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498341.34, E666847.10

**ELEVATION:** 3403.53'  
**TOTAL DEPTH:** 34.2'  
**TYPE OF WELL:** Shallow Exploratory Drilling Converted to Observation Well 12/16/78  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/12/78      **Date Completed:** 12/16/78

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling.

**PLUGGING SCHEDULE:**

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-20A</b>	Sand	0-13.9
	Caliche	13.9-19
	Gatuna	19-34.2

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-21  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498337.50, E667346.75

**ELEVATION:** 3404.55'  
**TOTAL DEPTH:** 40.4'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 11/17/78      **Date Completed:** 11/17/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-21</b>	Sand	0-9.5
	Caliche	9.5-20
	Gatuna	20-32.5
	Sandstone	32.5-40.4

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-22  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498339.28, E667846.73

**ELEVATION:** 3406.85'  
**TOTAL DEPTH:** 27.8'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/11/78      **Date Completed:** 12/11/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-22</b>	Sand	0-7.5
	Caliche	7.5-13
	Gatuna	13-27.8



## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-23  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498341.06, E668346.63

**ELEVATION:** 3412.07'  
**TOTAL DEPTH:** 40.5'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/06/78      **Date Completed:** 12/06/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-23</b>	Sand	0-6
	Caliche	6-14.3
	Gatuna	14.3-40.5

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-24  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498342.84, E668846.53

**ELEVATION:** 3417.87'  
**TOTAL DEPTH:** 29.3'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/07/78      **Date Completed:** 12/07/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Grouted with cement.

**STRATIGRAPHIC SUMMARY:**      Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-24</b>	Sand	0-5.5
	Caliche	5.5-12
	Gatuna	12-29.3

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-25  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499414.91, E666693.11

**ELEVATION:** 3408.19'  
**TOTAL DEPTH:** 901.8'  
**TYPE OF WELL:** Deep Exploratory Drilling  
**DRILLER:** Gil's Drilling Co.

**DRILLING RECORD:**      **Date Started:** 12/01/78      **Date Completed:** 01/18/79

**CASING RECORD:**      Drilling Equipment:  
GD-2000 drill.

**PLUGGING SCHEDULE:**      From: 909'  
To: 750.4'  
Interval: 158.6'  
Material: Salt Grout

From: 750.4'  
To: 466'  
Interval: 284.4'  
Material: Freshwater Grout

From: 466'  
To: 20'  
Interval: 446'  
Material: Sand

From: 20'  
To: Surface  
Interval: 20'  
Material: Cement

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-25</b>	Sand	0-10
	Caliche	10-14
	Gatuna	14-34.7
	Santa Rosa	34.7-44.8
	Dewey Lake	44.8-533
	Rustler Formation	533-842.9
	Magenta Member	592.7-617
	Culebra Member	704.1-728
	Salado Formation	842.9-901.8

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-26  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499600.58, E666892.43

**ELEVATION:** 3410.19'  
**TOTAL DEPTH:** 27.5'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/03/79      **Date Completed:** 01/03/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-26</b>	Sand	0-5
	Caliche	5-11
	Gatuna	11-23
	Siltstone	23-27.5



**SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-27  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498982.08, E665854.70

**ELEVATION:** 3400.20'  
**TOTAL DEPTH:** 25.8'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/11/79      **Date Completed:** 01/11/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-27</b>	Sand	0-4
	Caliche	4-11
	Gatuna	11-22
	Sandstone	22-22.5
	Claystone	22.5-23
	Sandstone	23-24
	Intercalated Sandstone	24-25.8

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-28  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499295.02, E666718.53

**ELEVATION:** 3408.17'  
**TOTAL DEPTH:** 27'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/04/79      **Date Completed:** 01/04/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-28</b>	Sand	0-6
	Caliche	6-12
	Gatuna	12-21
	Sandstone	21-27

**SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-29  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499397.21, E667253.07

**ELEVATION:** 3410.87'  
**TOTAL DEPTH:** 28.7'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/30/78      **Date Completed:** 12/30/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-29</b>	Sand Gatuna	0-13 13-28.7

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-30  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499185.81, E666933.86

**ELEVATION:** 3408.75'  
**TOTAL DEPTH:** 27.8'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/28/78      **Date Completed:** 12/28/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-30</b>	Sand	0-7.5
	Caliche	7.5-11.5
	Gatuna	11.5-17.6
	Sandstone	17.6-27.8



## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-31  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499206.60, E667143.76

**ELEVATION:** 3410.27  
**TOTAL DEPTH:** 30.5'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/29/78      **Date Completed:** 12/29/78

**CASING RECORD:** Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-31</b>	Sand	0-7.8
	Caliche	7.8-13.4
	Gatuna	13.4-30.5

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-32  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499187.96, E667523.76

**ELEVATION:** 3410.89'  
**TOTAL DEPTH:** 100'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/07/79      **Date Completed:** 01/07/79

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-32</b>	Sand	0-12.5
	Caliche	12.5-19.5
	Gatuna	19.5-26.5
	Siltstone & Claystone	26.5-43
	Santa Rosa	43-53
	Dewey Lake	53-100

**SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-33  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498874.29, E666470.03

**ELEVATION:** 3404.05'  
**TOTAL DEPTH:** 30.7'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 12/29/78      **Date Completed:** 12/29/78

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide culling faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-33</b>	Sand	0-6.7
	Caliche	6.7-15.8
	Gatuna	15.8-19
	Sandstone	19-24
	Intercalated Siltstone & Mudstone	24-29.8
	Sandstone	29.8-30.7

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-34  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498205.49, E666762.36

**ELEVATION:** 3401.97'  
**TOTAL DEPTH:** 100'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/09/79      **Date Completed:** 01/09/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-34</b>	Sand	0-9.1
	Caliche	9.1-14.8
	Gatuna	14.8-40
	Siltstone & Claystone	40-100



**SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-35  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498326.97, E667196.82

**ELEVATION:** 3402.55'  
**TOTAL DEPTH:** 32'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/05/79      **Date Completed:** 01/05/79

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-35</b>	Sand	0-7
	Caliche	7-12
	Gatuna	12-23
	Sandstone	23-32

**SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-36  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499293.25, E669018.07

**ELEVATION:** 3422.03'  
**TOTAL DEPTH:** 27.8'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/07/79      **Date Completed:** 01/07/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-36</b>	Sand	0-5.9
	Caliche	5.9-13.2
	Gatuna	13.2-25
	Siltstone	25-27.8

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-37  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499297.91, E670352.77

**ELEVATION:** 3438.91'  
**TOTAL DEPTH:** 27.5'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/09/79      **Date Completed:** 01/09/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-37</b>	Sand	0-5.5
	Caliche	5.5-12.5
	Gatuna	12.5-20
	Siltstone	20-20.3
	Sandstone	20.3-27.5

**SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-37A  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499260.53, E669370.39

**ELEVATION:** 3426.68'  
**TOTAL DEPTH:** 22.4'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/08/79      **Date Completed:** 01/08/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-37A</b>	Sand	0-5.5
	Caliche	5.5-13.5
	Gatuna	13.5-22.4



## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-38  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499155.65, E669683.42

**ELEVATION:** 3429.88'  
**TOTAL DEPTH:** 50'  
**TYPE OF WELL:** Shallow Exploratory Drilling Converted to Observation Well 1/23/79  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/11/79      **Date Completed:** 01/23/79

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-38</b>	Sand	0-5.5
	Caliche	5.5-14
	Gatuna	14-20.5
	Sandstone	20.5-40.2
	Santa Rosa	40.2-43.7
	Dewey Lake	43.7-50

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-39  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499018.31, E669019.04

**ELEVATION:** 3422.08'  
**TOTAL DEPTH:** 27.6'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/06/79      **Date Completed:** 01/07/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-39</b>	Sand	0-7
	Caliche	7-13
	Gatuna	13-27.6

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-40  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499023.04, E670353.77

**ELEVATION:** 3438.48'  
**TOTAL DEPTH:** 27.9'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/10/79      **Date Completed:** 01/10/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-40</b>	Sand	0-7.6
	Caliche	7.6-13
	Gatuna	13-19
	Sandstone	19-27.9

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-41  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499335.51, E666858.36

**ELEVATION:** 3407.86'  
**TOTAL DEPTH:** 100'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/05/79      **Date Completed:** 01/05/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-41</b>	Sand	0-6
	Caliche	6-15
	Gatuna	15-42
	Santa Rosa	42-48
	Dewey Lake	48-100



## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-42  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499335.57, E666873.35

**ELEVATION:** 3408.99'  
**TOTAL DEPTH:** 100'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/06/79      **Date Completed:** 01/06/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-42</b>	Sand	0-6
	Caliche	6-14
	Gatuna	14-42
	Santa Rosa	42-48
	Dewey Lake	48-100

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-43  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499202.96, E667523.70

**ELEVATION:** 3410.75'  
**TOTAL DEPTH:** 100'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/06/79      **Date Completed:** 01/06/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-43</b>	Sand	0-12
	Caliche	12-20
	Gatuna	20-43
	Santa Rosa	43-53
	Dewey Lake	53-100

## SUBSURFACE EXPLORATION BOREHOLE DATA BASE

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**BOREHOLE:** B-44  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499172.96, E667523.82

**ELEVATION:** 3411.48'  
**TOTAL DEPTH:** 100'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/08/79      **Date Completed:** 01/08/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-44</b>	Sand	0-16
	Caliche	16-21
	Gatuna	21-38
	Santa Rosa	38-52
	Dewey Lake	52-100

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-45  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498205.44, E666747.36

**ELEVATION:** 3401.51'  
**TOTAL DEPTH:** 100'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/10/79      **Date Completed:** 01/17/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Grouted with cement.

**STRATIGRAPHIC SUMMARY:**      Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-45</b>	Sand	0-7.5
	Caliche	7.5-15.3
	Gatuna	15.3-31.3
	Dewey Lake	31.3-44.2
	Sandstone	44.2-44.7
	Siltstone	44.7-100



## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-46  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498205.54, E666777.36

**ELEVATION:** 3401.98'  
**TOTAL DEPTH:** 100'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/08/79      **Date Completed:** 01/08/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Grouted with cement.

**STRATIGRAPHIC SUMMARY:**      Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-46</b>	Sand	0-8
	Caliche	8-13
	Gatuna	13-41
	Santa Rosa	41-48
	Dewey Lake	48-100

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-47  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499206.77, E667193.82

**ELEVATION:** 3409.49'  
**TOTAL DEPTH:** 17.5'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/25/79      **Date Completed:** 01/25/79

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-47</b>	Sand	0-8.9
	Caliche	8.9-15
	Gatuna	15-17.5

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-48  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498839.26, E667854.93

**ELEVATION:** 3412.12'  
**TOTAL DEPTH:** 15.7'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/24/79      **Date Completed:** 01/24/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-48</b>	Sand	0-9
	Caliche	9-15.7

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-49  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498937.22, E667294.71

**ELEVATION:** 3409.07'  
**TOTAL DEPTH:** 19.2'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/24/79      **Date Completed:** 01/24/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-49</b>	Sand	0-8.5
	Caliche	8.5-10.5
	Silty Sand	10.5-15
	Gatuna	15-19.2



## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-50  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498487.09, E667236.23

**ELEVATION:** 3405.65'  
**TOTAL DEPTH:** 23.7'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/26/79      **Date Completed:** 01/26/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Grouted with cement.

**STRATIGRAPHIC SUMMARY:**      Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-50</b>	Sand	0-9.5
	Caliche	9.5-15
	Gatuna	15-23.7

**SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-51  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N498337.48, E667341.75

**ELEVATION:** 3404.74'  
**TOTAL DEPTH:** 15.2'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/25/79      **Date Completed:** 01/25/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-51</b>	Sand	0-7.5
	Caliche	7.5-14.5
	Gatuna	14.5-15.2

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-52  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N496981.21, E665461.91

**ELEVATION:** 3385.48'  
**TOTAL DEPTH:** 30.0'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/26/79      **Date Completed:** 01/26/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-52</b>	Sand	0-3.1
	Caliche	3.1-8.5
	Gatuna	8.5-19
	Dewey Lake	19-30

**SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-53  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N496651.28, E665463.05

**ELEVATION:** 3386.65'  
**TOTAL DEPTH:** 30.2'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 01/30/79      **Date Completed:** 01/30/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Grouted with cement.

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-53</b>	Sand	0-8.5
	Caliche	8.5-15.7
	Gatuna	15.7-23.7
	Dewey Lake	23.7-30.2



## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-54  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** N499386.52, E666651.92

**ELEVATION:** 3408.60'  
**TOTAL DEPTH:** 210'  
**TYPE OF WELL:** Shallow Exploratory Drilling Converted to Observation Well 02/14/79  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 02/13/79      **Date Completed:** 02/14/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-54</b>	Sand	0-6
	Caliche	6-12
	Gatuna	12-25
	Santa Rosa	25-30
	Dewey Lake	30-210

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-301  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** North Access Road

**ELEVATION:** Not Recorded  
**TOTAL DEPTH:** 39.7'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 02/08/79      **Date Completed:** 02/08/79

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Backfilled with native drilled material

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-301</b>	Sand	0-1
	Caliche	1-24
	Dewey Lake	24-39.7

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-302  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** North Access Road

**ELEVATION:** Not Recorded  
**TOTAL DEPTH:** 39'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 02/07/79      **Date Completed:** 02/07/79

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Backfilled with native drilled material

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-302</b>	Sand	0-10.4
	Caliche	10.4-23
	Dewey Lake	23-39.0

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-303  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** North Access Road

**ELEVATION:** Not Recorded  
**TOTAL DEPTH:** 39.1'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 02/07/79      **Date Completed:** 02/07/79

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Backfilled with native drilled material

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-303</b>	Sand	0-15.5
	Caliche	15.5-18
	Dewey Lake	18-39.1



## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-304  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** North Access Road

**ELEVATION:** Not Recorded  
**TOTAL DEPTH:** 41.5'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 02/06/79      **Date Completed:** 02/06/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Backfilled with native drilled material

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-304</b>	Sand	0-20.6
	Caliche	20.6-33
	Sand	33-41.5

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-305  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** North Access Road

**ELEVATION:** Not Recorded  
**TOTAL DEPTH:** 41'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 02/06/79      **Date Completed:** 02/06/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Backfilled with native drilled material

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-305</b>	Sand	0-14.5
	Caliche	14.5-19.5
	Sand	19.5-25.5
	Caliche	25.5-33
	Sand	33-41

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-306  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** North Access Road

**ELEVATION:** Not Recorded  
**TOTAL DEPTH:** 38'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 02/02/79      **Date Completed:** 02/02/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:**      Backfilled with native drilled material

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-306</b>	Sand	0-7.3
	Caliche	7.3-18
	Santa Rosa	18-38

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-307  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** Railroad

**ELEVATION:** Not Recorded  
**TOTAL DEPTH:** 40'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 02/01/79      **Date Completed:** 02/01/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Backfilled with native drilled material

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-307</b>	Caliche	0-5.6
	Sand	5.6-11.1
	Gatuna	11.1-17.1
	Dewey Lake	17.1-40



## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-308  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** Railroad

**ELEVATION:** Not Recorded  
**TOTAL DEPTH:** 39.9'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 02/01/79      **Date Completed:** 02/01/79

**CASING RECORD:**      Drilling Equipment:  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Backfilled with native drilled material

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b><u>BOREHOLE</u></b>	<b><u>ROCK UNIT</u></b>	<b><u>DEPTH INTERVAL IN FEET</u></b>
<b>B-308</b>	Caliche	0-10.5
	Gatuna	10.5-19.5
	Dewey Lake	19.5-39.9

## **SUBSURFACE EXPLORATION BOREHOLE DATA BASE**

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**BOREHOLE:** B-309  
**OPERATOR:** Sergeant, Hauskins, & Beckwith  
**PERMIT NO.:** Unknown

**LOCATION:** South Access Road

**ELEVATION:** Not Recorded  
**TOTAL DEPTH:** 39.4'  
**TYPE OF WELL:** Shallow Exploratory Drilling  
**DRILLER:** Sergeant, Hauskins & Beckwith

**DRILLING RECORD:**      **Date Started:** 02/02/79      **Date Completed:** 02/02/79

**CASING RECORD:**      **Drilling Equipment:**  
Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

**PLUGGING SCHEDULE:** Backfilled with native drilled material

**STRATIGRAPHIC SUMMARY:** Attached

**STRATIGRAPHIC SUMMARY**

<b>BOREHOLE</b>	<b>ROCK UNIT</b>	<b>DEPTH INTERVAL IN FEET</b>
<b>B-309</b>	Sand	0-5.6
	Caliche	5.6-14
	Gatuna	14-19.8
	Santa Rosa	19.8-22
	Dewey Lake	22-39.4

## REFERENCE LIST

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