# Proposal for an Oil Treating Plant Permit and Surface Waste Disposal in Lea County, New Mexico

Prepared for

Controlled Recovery Inc.
Hobbs, New Mexico
February 1990

BEFORE EXAMINER CATANACH
OIL CONSERVATION DIVISION
CONTROLLED RECOVERY EXHIBIT NO. 10
CASE NO. 9882

By

James T. Wright
Consulting Hydrologist
Roswell, New Mexico

EXHIBIT
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## INTRODUCTION

On September 22, 1989 I was contacted by Ken Marsh and asked to review existing hydrological reports covering western Lea County and evaluate the possibility of constructing a surface disposal system on land owned by him located in the N 1/2 S 1/2 and S 1/2 N 1/2 of Section 27, T. 20 S., R. 32 E.

After reviewing these reports and collecting as much basic geohydrological data that was available from the United States Geological Survey, the New Mexico State Engineer, the U.S. Bureau of Land Management and other minor sources, I advised Mr. Marsh that there was a possibility of getting a permit from the Oil Conservation Division, but that we would need to drill some exploratory holes in the immediate area in order to obtain sufficient data to do some detailed sub-surface mapping in order to determine the direction of ground water movement from the proposed site.

On October 31, 1989, seven exploratory holes were drilled by Larry's Drilling and Pump Co. of Hobbs, New Mexico on the property owned by Ken Marsh in Section 27, T. 20 S., R. 32 E. On January 26, 1990, three additional exploratory holes were drilled on U.S.B.L.M. land in the immediate vicinity of the Ken Marsh property. Larry's Drilling and Pump Co. of Hobbs also drilled these holes. Data collected from these holes as well as data collected from previously drilled holes and existing wells is shown in Table I of this report.

## GENERAL GEOLOGY

The site is located in western Lea County in the southern portion of the Querecho Plains. A group of four playa lakes are located within the general area with the closest one being Laguna Toston, located about 1 mile northwest of the site. Laguna

Toston has a surface area of approximately 160 acres and is presently being used as a disposal pond by one of the potash companies.

A geologic map of southern Lea County taken from U.S. Bureau of Mines Ground-Water Report 6 is included in this report as Figure III. An inspection of this map shows that the surface geology consists of alluvial material in the vicinity of the proposed site.

## LOCAL GEOLOGY

The area covered by this study includes most of Township 20 South, Range 32 East, with the principal area of interest being Section 27. The Quaternary alluvium in the immediate vicinity of Section 27 varies in thickness from 0 to 45 feet. The underlying Red Beds of Triassic and Permian age are approximately 800 feet thick. These formations consist predominantly of clays and siltstones, but some very fine grained sandstone may also be present. The upper part of these Red Beds is believed to be Chinle Formation and the lower portion Dewey Lake Red Beds. These formations are underlain by the Rustler Formation which is about 300 feet thick underneath the site area. The Rustler Formation consists primarily of anhydride or gypsum with some limestone and clays.

## HYDROLOGY

The alluvium at the proposed site area is less than 45 feet thick with the thickness of the saturated sediments varying from 0 to 8 feet. Test hole #1a located in the NE 1/4 NE 1/4 NE 1/4 NE 1/4 NE 1/4 of Section 28, T. 20 S., R. 32 E. has a saturated thickness of 13 feet. The ground water movement through the alluvium in the vicinity of the proposed site is toward the playa lakes (Laguna Toston and Laguna Plata). The water table gradient is approximately 15 feet per mile. Recharge to the aquifer is from rainfall which only averages about 9 inches per year in this area and consequently is not considered a significant source of recharge.

A bailing test ran on test hole #5 on November 9, 1989 by Ken Marsh indicates that the permeability of the water bearing formation is very low. Hole was bailed dry in 1 hour. Bailing test produced 2 gallons of water in 15 minutes or 0.13 gallons per minute. Test hole #3 was dry when completed on November 1, 1989. On November 9, 1989 the fluid level was 41.1 feet below land surface and on November 21, 1989 it was 32.56 feet below land surface. Test hole #7 had a fluid level of 49.07 feet below land surface on November 1, 1989, 38.25 feet on November 9, 1989, 33.31 feet on November 21, 1989 and 33.33 feet on January 26, 1990. The long period of time that it took the fluid to reach equilibrium in the holes is also an indicator of low permeability. Although there is some water in ground water storage underneath the proposed site, it is not economically feasible to produce this water due to the extremely low yields. Most of the ranches in this area of Lea County obtain their water from water transmission lines which deliver Ogallala water from wells in the Buckeye area to the potash mines located in western Eddy County.

## QUALITY

Ken Marsh had water samples collected from all of the holes in the vicinity of the proposed site on February 6, 1990. These samples were analyzed by Rozanne Johnson, Bacteriologist for the City of Hobbs laboratory. According to Mr. Marsh, it was her opinion that the water was unfit for human or animal consumption. Copies of her analysis are included in this report.

## SUMMARY AND CONCLUSIONS

The alluvium in the vicinity of Section 27, T. 20 S., R. 32 E. is thin and contains only minimal quantities of ground water. Production of this water from wells is not feasible due to the low well capacities. The only water wells presently being used are located over one mile east of the proposed site and are up gradient from the water table altitude at the proposed site. Microbiological water reports of the shallow ground water underlying the proposed site indicate that the water is not potable.

In my opinion the disposal of brine in surface disposal pits at the proposed site located in Section 27, T.20 S., R. 32 E. will not contaminate any fresh ground water supplies. Water from these pits will migrate downward until it reaches the base of the alluvium. Since the upper part of the Triassic is relatively impermeable the water will move laterally down gradient and eventually discharge into the playa lakes located to the north. The volume of the east pit shown on Figure I is approximately 368,000 barrels; and the volume of the west pit is approximately 336,000 barrels.

## WELL-NUMBERING SYSTEM

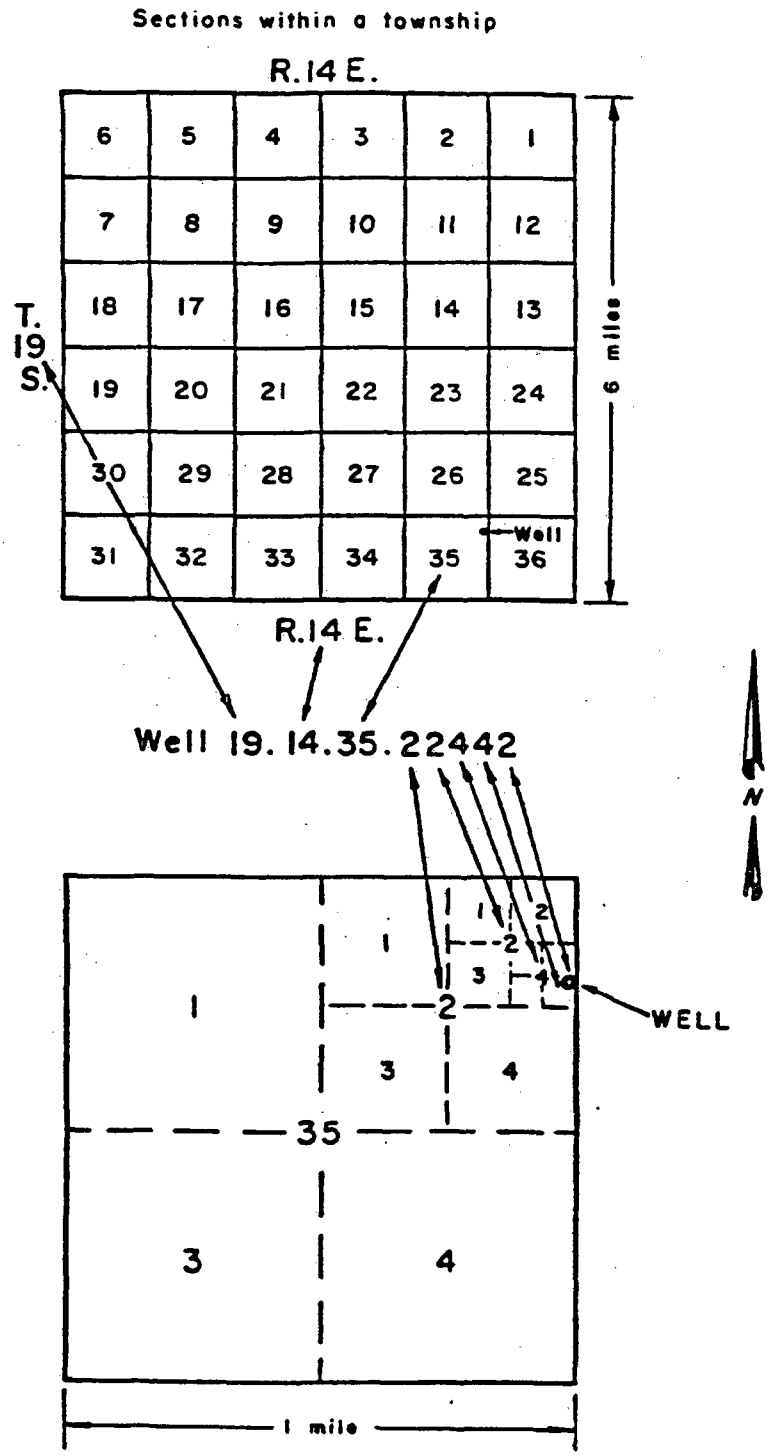
The system of numbering wells in New Mexico is based on the common subdivisions in sectionized land, and, by means of it, the well number, in addition to designating the well, locates its position to the nearest 0.625-acre tract in the land net. The number is divided into four segments by periods. The first segment denotes the township north or south of the New Mexico base line; the second denotes the range east or west of the New Mexico principal meridian; and the third denotes the section. An "N" is added to the first segment of the well number if the well is north of the base line, but no letter is added if the well is south of the base line. Similarly, where wells are located west of the meridian, a "W" is added to the second segment of the well number of those wells west of the meridian but no letter is added if the well is east of the meridian.

The fourth segment of the number, which consists of five digits, denotes the particular 0.625-acre tract in which the well is situated. For this purpose the section is divided into four quarters numbered 1, 2, 3, and 4, in the normal reading order, for the northwest, northeast, southwest, and southeast quarters, respectively. The first digit of the fourth segment gives the quarter section, which is a tract of 160 acres. Similarly, the quarter section is divided into four 40-acre tracts numbered in the same manner, and the second digit denotes the 40-acre tract. The 40-acre tract is divided into four 10-acre tracts and the third digit denotes the 10-acre tract. The 10-acre tract is divided into four 2.5-acre tracts and the fourth digit denotes the 2.5-acre tract. The 2.5-acre tract is divided into four tracts containing 0.625 acres each and the fifth digit determines this tract. Thus, well 12.36.24.12311 in Lea County is in the NW 1/4 NW 1/4 SW 1/4 NE 1/4 NW 1/4 Sec. 24, T. 12 S., R. 36 E. If a well cannot be located accurately to a 10-acre tract, a zero is used as the third digit, and if it cannot be located accurately within a 40-acre tract, zeros are used for both the second and third digits. If the well cannot be located more closely than the section, the fourth segment of the well number is omitted.

Letters a, b, c, - - - - - - - are added to the last segment to designate the second, third, fourth and succeeding wells in the same 0.625-acre tract.

The following diagram shows the method of numbering the tracts within a section:

**Diagram:** System of numbering wells in New Mexico.



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# RECORD OF DRILL HOLES IN THE VICINITY OF SECTION 27 T20S R32E

| LOCATION NUMBER | OWNER | AQUIFER | HOLE DEPTH | LAND SURFACE ELEVATION | WATER LEVEL | DATE MEASURED | WATER TABLE ELEVATION | THICKNESS OF ALLUVIUM | DEPTH TO RED BED | RED BED ELEVATION | CASING SIZE | USE OF WATER | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20.32.01.314114 | V. N. SNYDER | ALLUVIUM | 30 | 3510.0 | 21.77 | 07-01-54 | 3488 | UNK | UNK | 0 | 6" | STOCK | WELL DRY IN 1968 |
| 20.32.22.322142 | KEN MARSH | ALLUVIUM | 55 | 3527.0 | 35.40 | 01-26-90 | 3492 | 45 | 45 | 3482 | 3" | NONE | TEST HOLE #2a |
| 20.32.22.322142 | KEN MARSH | ALLUVIUM | 55 | 3527.0 | 35.00 | 02-05-90 | 3492 | 45 | 45 | 3482 | 3" | NONE | REPT. WATER LEVEL |
| 20.32.22.322142 | KEN MARSH | ALLUVIUM | 55 | 3527.0 | 35.80 | 02-16-90 | 3491 | 45 | 45 | 3482 | 3" | NONE | JETTED DRY 2-5-90 |
| 20.32.23.33132 | UNK | ALLUVIUM | UNK | 3541.0 | 39.14 | 02-25-76 | 3502 | UNK | UNK | 0 | 7" | NONE | UNEQUIPPED WELL |
| 20.32.23.33132 | UNK | ALLUVIUM | UNK | 3541.0 | 39.83 | 02-19-81 | 3501 | UNK | UNK | 0 | 7" | NONE | UNEQUIPPED WELL |
| 20.32.23.43312 | BILL STANFORD | ALLUVIUM | 78 | 3551.0 | 39.40 | 05-29-68 | 3512 | UNK | UNK | 0 | 6" | STOCK | SUBMERSIBLE PUMP |
| 20.32.23.43312 | BILL STANFORD | ALLUVIUM | 78 | 3551.0 | 37.46 | 02-02-71 | 3514 | UNK | UNK | 0 | 6" | STOCK | SUBMERSIBLE PUMP |
| 20.32.23.43312 | BILL STANFORD | ALLUVIUM | 78 | 3551.0 | 36.78 | 02-19-81 | 3514 | UNK | UNK | 0 | 6" | NONE | WELL ABANDONED |
| 20.32.23.43312 | BILL STANFORD | ALLUVIUM | 78 | 3551.0 | 38.42 | 03-25-86 | 3513 | UNK | UNK | 0 | 6" | NONE | WELL ABANDONED |
| 20.32.23.43312A | BILL STANFORD | ALLUVIUM | UNK | 3551.0 | 37.63 | 02-19-81 | 3513 | UNK | UNK | 0 | 6" | NONE | UNEQUIPPED |
| 20.32.24.33333 | G.H. BINGHAM | ALLUVIUM | 65 | 3555.0 | 38.55 | 05-29-68 | 3516 | UNK | UNK | 0 | 6" | STOCK | WINDMILL |
| 20.32.24.33333 | G.H. BINGHAM | ALLUVIUM | 65 | 3555.0 | 37.59 | 02-02-71 | 3517 | UNK | UNK | 0 | 6" | STOCK | WINDMILL |
| 20.32.24.33333 | G.H. BINGHAM | ALLUVIUM | 65 | 3555.0 | 35.33 | 02-24-76 | 3520 | UNK | UNK | 0 | 6" | STOCK | WINDMILL |
| 20.32.24.33333A | G.H. BINGHAM | ALLUVIUM | 65 | 3555.0 | 38.04 | 05-29-68 | 3517 | UNK | UNK | 0 | 6" | STOCK | PUMP JACK |
| 20.32.24.33333A | G.H. BINGHAM | ALLUVIUM | 65 | 3555.0 | 37.83 | 02-02-71 | 3517 | UNK | UNK | 0 | 6" | STOCK | PUMP JACK |
| 20.32.24.33333A | G.H. BINGHAM | ALLUVIUM | 65 | 3555.0 | 37.42 | 09-11-72 | 3518 | UNK | UNK | 0 | 6" | STOCK | PUMP JACK |
| 20.32.24.33333A | G.H. BINGHAM | ALLUVIUM | 65 | 3555.0 | 35.68 | 02-24-76 | 3519 | UNK | UNK | 0 | 6" | STOCK | PUMP JACK |
| 20.32.24.33333A | G.H. BINGHAM | ALLUVIUM | 65 | 3555.0 | 37.69 | 02-19-81 | 3517 | UNK | UNK | 0 | 6" | STOCK | PUMP JACK |
| 20.32.24.33333A | G.H. BINGHAM | ALLUVIUM | 65 | 3555.0 | 38.99 | 03-25-86 | 3516 | UNK | UNK | 0 | 6" | STOCK | PUMP JACK |
| 20.32.27.132121 | KEN MARSH | ALLUVIUM | 50 | 3529.0 | 23.91 | 11-01-89 | 3505 | 32 | 32 | 3497 | 3" | NONE | TEST HOLE #6 |
| 20.32.27.132121 | KEN MARSH | ALLUVIUM | 50 | 3529.0 | 23.63 | 11-09-89 | 3505 | 32 | 32 | 3497 | 3" | NONE | REPT. WATER LEVEL |
| 20.32.27.132121 | KEN MARSH | ALLUVIUM | 50 | 3529.0 | 23.77 | 11-21-89 | 3505 | 32 | 32 | 3497 | 3" | NONE | TEST HOLE #6 |
| 20.32.27.132121 | KEN MARSH | ALLUVIUM | 50 | 3529.0 | 24.50 | 02-16-90 | 3505 | 32 | 32 | 3497 | 3" | NONE | TEST HOLE #6 |
| 20.32.27.14332 | JOEL FREY | ALLUVIUM | 25 | 3539.0 | 23.32 | 09-18-72 | 3516 | UNK | UNK | 0 | DUG | NONE | WINDMILL |
| 20.32.27.144133 | KEN MARSH | ALLUVIUM | 60 | 3539.0 | 25.91 | 11-01-89 | 3513 | 34 | 34 | 3505 | 3" | NONE | TEST HOLE #5 |
| 20.32.27.144133 | KEN MARSH | ALLUVIUM | 60 | 3539.0 | 25.50 | 11-09-89 | 3514 | 34 | 34 | 3505 | 3" | NONE | REPT. WATER LEVEL |
| 20.32.27.144133 | KEN MARSH | ALLUVIUM | 60 | 3539.0 | 25.88 | 11-21-89 | 3513 | 34 | 34 | 3505 | 3" | NONE | TEST HOLE #5 |
| 20.32.27.144133 | KEN MARSH | ALLUVIUM | 60 | 3539.0 | 26.44 | 02-16-90 | 3513 | 34 | 34 | 3505 | 3" | NONE | TEST HOLE #5 |
| 20.32.27.234210 | KEN MARSH | NONE | 50 | 3542.0 | DRY | 11-01-89 | 0 | 34 | 34 | 3508 | 3" | NONE | TEST HOLE # 3 |
| 20.32.27.234210 | KEN MARSH | ALLUVIUM | 50 | 3542.0 | 41.10 | 11-09-89 | 3501 | 34 | 34 | 3508 | 3" | NONE | REPT. WATER LEVEL |
| 20.32.27.234210 | KEN MARSH | ALLUVIUM | 50 | 3542.0 | 32.56 | 11-21-89 | 3509 | 34 | 34 | 3508 | 3" | NONE | TEST HOLE # 3 |
| 20.32.27.234210 | KEN MARSH | ALLUVIUM | 50 | 3542.0 | 34.41 | 02-16-90 | 3508 | 34 | 34 | 3508 | 3" | NONE | JETTED DRY 2-5-90 |
| 20.32.27.314122 | KEN MARSH | ALLUVIUM | 50 | 3541.0 | 49.07 | 11-01-89 | 3492 | 35 | 35 | 3506 | 3" | NONE | TESTHOLE #7 |
| 20.32.27.314122 | KEN MARSH | ALLUVIUM | 50 | 3541.0 | 38.25 | 11-09-89 | 3503 | 35 | 35 | 3506 | 3" | NONE | REPT. WATER LEVEL |
| 20.32.27.314122 | KEN MARSH | ALLUVIUM | 50 | 3541.0 | 33.31 | 11-21-89 | 3508 | 35 | 35 | 3506 | 3" | NONE | TESTHOLE #7 |
| 20.32.27.314122 | KEN MARSH | ALLUVIUM | 50 | 3541.0 | 33.33 | 02-16-90 | 3508 | 35 | 35 | 3506 | 3" | NONE | TESTHOLE #7 |
| 20.32.27.322331 | KEN MARSH | ALLUVIUM | UNK | 3527.0 | 15.30 | 03-29-68 | 3512 | UNK | UNK | 0 | 6" | STOCK | PUMP SHUT OFF 34 MIN. |
| 20.32.27.322331 | KEN MARSH | ALLUVIUM | UNK | 3527.0 | 0.94 | 02-25-76 | 3526 | UNK | UNK | 0 | 6" | NONE | WELL UNEQUIPPED |
| 20.32.27.322331 | KEN MARSH | ALLUVIUM | UNK | 3527.0 | 15.33 | 02-19-81 | 3512 | UNK | UNK | 0 | 6" | NONE | WELL UNEQUIPPED |
| 20.32.27.322331 | KEN MARSH | ALLUVIUM | UNK | 3527.0 | 17.60 | 11-01-89 | 3509 | UNK | UNK | 0 | 6" | NONE | WELL UNEQUIPPED |
| 20.32.27.322331 | KEN MARSH | ALLUVIUM | UNK | 3527.0 | 17.53 | 11-21-89 | 3509 | UNK | UNK | 0 | 6" | NONE | WELL UNEQUIPPED |
| 20.32.27.322331 | KEN MARSH | ALLUVIUM | UNK | 3527.0 | 17.40 | 02-16-90 | 3510 | UNK | UNK | 0 | 6" | NONE | WELL UNEQUIPPED |

TABLE 1

# RECORD OF DRILL HOLES IN THE VICINITY OF SECTION 27 T20S R32E

| LOCATION NUMBER | OWNER | AQUIFER | HOLE DEPTH | LAND SURFACE ELEVATION | WATER LEVEL | DATE MEASURED | WATER TABLE ELEVATION | THICKNESS OF ALLUVIUM | DEPTH TO RED BED | RED BED ELEVATION | CASING SIZE | USE OF WATER | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20.32.27.322333 | T. BINGHAM | ALLUVIUM | 75 | 3530.0 | 16.55 | 02-02-71 | 3513 | UNK | UNK | 0 | 6 5/8" | STOCK | WINDMILL |
| 20.32.27.322333 | T. BINGHAM | ALLUVIUM | 75 | 3530.0 | 4.69 | 02-25-89 | 3525 | UNK | UNK | 0 | 6 5/8" | STOCK | WINDMILL |
| 20.32.27.412333 | KEN MARSH | NONE | 60 | 3550.0 | DRY | 11-01-89 | 0 | 39 | 39 | 3511 | 3" | NONE | TEST HOLE #4 |
| 20.32.27.412333 | KEN MARSH | NONE | 60 | 3550.0 | DRY | 11-09-89 | 0 | 39 | 39 | 3511 | 3" | NONE | REPT. WATER LEVEL |
| 20.32.27.412333 | KEN MARSH | NONE | 60 | 3550.0 | DRY | 11-21-89 | 0 | 39 | 39 | 3511 | 3" | NONE | TEST HOLE #4 |
| 20.32.27.412333 | KEN MARSH | NONE | 60 | 3550.0 | DRY | 02-16-90 | 0 | 39 | 39 | 3511 | 3" | NONE | TEST HOLE #4 |
| 20.32.27.422221 | KEN MARSH | NONE | 50 | 3546.0 | DRY | 11-01-89 | 0 | 38 | 38 | 3508 | 3" | NONE | TEST HOLE #2 |
| 20.32.27.422221 | KEN MARSH | NONE | 50 | 3546.0 | DRY | 11-09-89 | 0 | 38 | 38 | 3508 | 3" | NONE | REPT. WATER LEVEL |
| 20.32.27.422221 | KEN MARSH | NONE | 50 | 3546.0 | DRY | 11-21-89 | 0 | 38 | 38 | 3508 | 3" | NONE | TEST HOLE #2 |
| 20.32.27.422221 | KEN MARSH | NONE | 50 | 3546.0 | DRY | 02-16-90 | 0 | 38 | 38 | 3508 | 3" | NONE | TEST HOLE #2 |
| 20.32.27.424443 | KEN MARSH | NONE | 99 | 3533.0 | DRY | 11-01-89 | 0 | 39 | 39 | 3494 | 3" | NONE | TEST HOLE #1 |
| 20.32.27.424443 | KEN MARSH | NONE | 99 | 3533.0 | DRY | 11-09-89 | 0 | 39 | 39 | 3494 | 3" | NONE | REPT. WATER LEVEL |
| 20.32.27.424443 | KEN MARSH | NONE | 99 | 3533.0 | DRY | 11-21-89 | 0 | 39 | 39 | 3494 | 3" | NONE | TEST HOLE #1 |
| 20.32.27.424443 | KEN MARSH | NONE | 99 | 3533.0 | DRY | 02-16-90 | 0 | 39 | 39 | 3494 | 3" | NONE | TEST HOLE #1 |
| 20.32.28.222224 | KEN MARSH | ALLUVIUM | 37 | 3519.0 | 14.76 | 01-26-90 | 3504 | 28 | 28 | 3491 | 3" | NONE | TEST HOLE #1a |
| 20.32.28.222224 | KEN MARSH | ALLUVIUM | 37 | 3519.0 | 14.00 | 02-05-90 | 3505 | 28 | 28 | 3491 | 3" | NONE | REPT. WATER LEVEL |
| 20.32.28.222224 | KEN MARSH | ALLUVIUM | 37 | 3519.0 | 14.87 | 02-16-90 | 3504 | 20 | 20 | 3499 | 3" | NONE | TEST HOLE #1a |
| 20.32.28.243123 | KEN MARSH | ALLUVIUM | 55 | 3522.0 | 17.25 | 01-26-90 | 3505 | 20 | 20 | 3502 | 3" | NONE | TEST HOLE #3a |
| 20.32.28.243123 | KEN MARSH | ALLUVIUM | 55 | 3522.0 | 15.20 | 02-05-90 | 3507 | 20 | 20 | 3502 | 3" | NONE | REPT. WATER LEVEL |
| 20.32.28.243123 | KEN MARSH | ALLUVIUM | 55 | 3522.0 | 15.95 | 02-13-90 | 3506 | 20 | 20 | 3502 | 3" | NONE | REPT. WATER LEVEL |
| 20.32.28.243123 | KEN MARSH | ALLUVIUM | 55 | 3522.0 | 17.32 | 02-16-90 | 3505 | 20 | 20 | 3502 | 3" | NONE | JETTED DRY 2-5-90 |
| 20.32.36.21424 | G.H. BINGHAM | ALLUVIUM | 60 | 3585.0 | 46.60 | 06-06-55 | 3538 | UNK | UNK | 0 | 6 5/8" | DOM | PUMPED RECENTLY |
| 20.32.36.21442 | G.H. BINGHAM | ALLUVIUM | 50 | 3581.0 | 43.88 | 09-18-72 | 3537 | UNK | UNK | 0 | DUG | DOM | WINDMILL |
| 20.32.36.22311 | G.H. BINGHAM | ALLUVIUM | 65 | 3586.0 | 44.51 | 05-29-68 | 3541 | UNK | UNK | 0 | 6" | STOCK | PUMPING |
| 20.32.36.22311 | G.H. BINGHAM | ALLUVIUM | 65 | 3586.0 | 46.01 | 02-03-71 | 3540 | UNK | UNK | 0 | 6" | STOCK | PUMPING |
| 20.32.36.22311 | G.H. BINGHAM | ALLUVIUM | 65 | 3586.0 | 41.26 | 02-25-76 | 3545 | UNK | UNK | 0 | 6" | STOCK | WINDMILL BROKEN |
| 20.32.36.22311 | BILL SMITH | ALLUVIUM | 65 | 3586.0 | 45.82 | 02-19-81 | 3540 | UNK | UNK | 0 | 6" | STOCK | WINDMILL |
| 21.31.01.13143 | MIKE CAMPBELL | ALLUVIUM | 36 | 3576.1 | 30.31 | 05-29-68 | 3546 | UNK | UNK | 0 | 10 3/4" | STOCK | WINDMILL |
| 21.31.01.13143 | MIKE CAMPBELL | ALLUVIUM | 36 | 3576.1 | 26.31 | 02-03-71 | 3550 | UNK | UNK | 0 | 10 3/4" | STOCK | WINDMILL |
| 21.31.01.13143 | MATTHEWS | ALLUVIUM | 36 | 3576.1 | 20.80 | 09-18-72 | 3555 | UNK | UNK | 0 | 10 3/4" | STOCK | WINDMILL |
| 21.31.01.13143 | MATTHEWS | ALLUVIUM | 36 | 3576.1 | 19.68 | 02-25-76 | 3556 | UNK | UNK | 0 | 10 3/4" | STOCK | WINDMILL |
| 21.31.01.13143 | MATTHEWS | ALLUVIUM | 36 | 3576.1 | 24.34 | 12-28-76 | 3552 | UNK | UNK | 0 | 10 3/4" | STOCK | WINDMILL |
| 21.31.01.13143 | MATTHEWS | ALLUVIUM | 36 | 3576.1 | DRY | 01-17-81 | 0 | UNK | UNK | 0 | 10 3/4" | NONE | WELL DRY |
| 21.31.02.22123 | MIKE CAMPBELL | ALLUVIUM | 35 | 3572.7 | 30.10 | 05-29-68 | 3543 | UNK | UNK | 0 | UNK | STOCK | WINDMILL |
| 21.31.02.22123 | MIKE CAMPBELL | ALLUVIUM | 35 | 3572.7 | 30.59 | 02-02-71 | 3542 | UNK | UNK | 0 | UNK | STOCK | WINDMILL |
| 21.31.02.22123 | MATTHEWS | ALLUVIUM | 35 | 3572.7 | 29.80 | 09-18-72 | 3543 | UNK | UNK | 0 | UNK | STOCK | WINDMILL |
| 21.31.02.22123 | MATTHEWS | ALLUVIUM | 35 | 3572.7 | 28.67 | 02-25-76 | 3544 | UNK | UNK | 0 | UNK | STOCK | WINDMILL |
| 21.31.02.22123 | MATTHEWS | ALLUVIUM | 35 | 3572.7 | 30.26 | 12-28-76 | 3542 | UNK | UNK | 0 | UNK | STOCK | WINDMILL |
| 21.31.02.22123 | MATTHEWS | ALLUVIUM | 35 | 3572.7 | DRY | 10-14-81 | 0 | UNK | UNK | 0 | UNK | NONE | WELL DRY |

TABLE 1 (continued)

# A P P E N D I X  " A "

20.32.21.22222
LS ELEV. 3517

0- 25 CALICHE
25-150 SHALE & RED CLAY
150-160 RED BED

20.32.21.24112
LS ELEV. 3524

0- 25 CALICHE
25- 50 CLAY
50-100 SANDSTONE
100-140 CLAY & SHALE

20.32.21.343344
LS ELEV. 3502

0- 46 CALICHE-SANDY CLAY
46- 80 RED CLAY
80-150 SHALE & CLAY STREAKS

20.32.21.42424
LS ELEV. 3518

0- 20 SAND & CALICHE
20- 65 MIXED CLAY
65-150 RED CLAY & SHALE

20.32.21.434343
LS ELEV. 3508

0- 32 CALICHE
32- 88 RED CLAY
88-160 SHALE & RED CLAY
160-200 HARD SHALE

20.32.21.44444
LS ELEV. 3523

0- 20 CALICHE
20- 40 LOOSE ROCK
40-150 RED CLAY & SHALE

20.32.22.13311
LS ELEV. 3522

0- 36 CALICHE
36- 68 MIXED CLAY W/HARD STREAKS
68-150 RED BED & SHALE STREAKS

20.32.22.34343
LS ELEV. 3544

0- 15 CALICHE
15- 50 SANDY CLAY
50- 85 MIXED CLAY
85-150 RED BED & SHALE

20.32.22.43434
LS ELEV. 3542

0- 32 CALICHE
32- 90 MIXED CLAY
90-130 SHALE
130-150 RED CLAY

20.32.22.44444
LS ELEV. 3541

0- 20 CALICHE
20- 55 CLAY
55-105 RED CLAY
105-150 RED CLAY & SHALE

20.32.28.111134
LS ELEV. 3487

0- 20 CALICHE
20-350 RED BED & RED SHALE
W/ROCK LEDGES

20.32.28.242422
LS ELEV. 3531

0- 18 CALICHE
18- 30 GRAVEL
30-150 RED BED

20.32.28.424242
LS ELEV. 3542

0- 20 CALICHE
20- 30 GRAVEL
30-150 RED BED

1250 FNL 1250 FWL

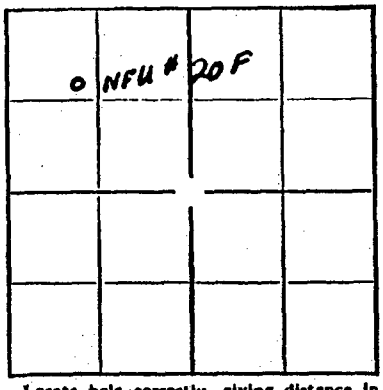
P-1147

Copy mailed to Washington

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Budget Bureau No. 42-R352.2
Approval expires Dec. 31, 1954

U. S. Land Office New Mexico
Serial Number Permit 0437
Date effective




Locate hole correctly, giving distance in feet from N. or S. and E. or W. line of section; when hole is not vertical, give direction and angle.

# LOG OF PROSPECT BORE HOLE

Logs of prospect bore holes are to be transmitted in duplicate to the regional mining supervisor immediately upon completion of hole or shaft, or when work has been suspended indefinitely.

Lessee or permittee ... Farmers Educational and Cooperative Union of America
Address ... 3508 East 46th Avenue, Denver, Colorado
Driller ... O. F. Featherstone
Commenced drilling ... 2-10-53 Finished ... 3-1-53
Hole No. ... P-20 Sec. ... 27 T. ... 20S R. ... 32E M. ... N.M.P. State ... N.M.
Method of drilling ... Rotary Logged by ... Charles Hicks

The information given herewith is a complete and correct record of the bore hole and all work done thereon, so far as can be determined from all available records.

RECEIVED
APR - 1 1953

(Signed) Charles W. Hicks

Date ... March 6, 1953 U. S. Geological Survey (Title) ... Geologist

Section 35(A) of the United States Criminal Code (18 U.S.C. 80), makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

Elevation of top of hole relative to sea level ... 3532 ✓

## FORMATION RECORD

| DEPTH From— Feet | DEPTH From— Inches | DEPTH To— Feet | DEPTH To— Inches | Thickness of stratum Feet | Thickness of stratum Inches | Geologic formations; character of rock; oil, gas and water horizons; coal and other mineral occurrences |
|---|---|---|---|---|---|---|
| | | | | | | |

Farmers 21-F

| From | To | Inter | Formation |
|---|---|---|---|
| 0' | 20' | 20' | Caliche - A little silty clay in the bottom 10'. |
| 20' | 40' | 20' | Sand - Fine grained. Approx. 30% red shale in the lower 10' |
| 40' | 70' | 30' | Shale - Brown and grey. |
| 70' | 160' | 90' | Shale - Reddish brown. |
| 160' | 200' | 40' | Siltstone - Red, some grey. |
| 200' | 220' | 20' | Siltstone - Red to magenta, a little grey. Approx. 40% sandstone. |
| 220' | 280' | 60' | Sandstone - Red. Approx. 20% red to magenta siltstone. |
| 280' | 300' | 20' | Shale - Red, a little magenta and grey. |
| 300' | 310' | 10' | Sandstone - Red. A little red and grey shale. |
| 310' | 330' | 20' | Clay - Red, silty. |
| 330' | 360' | 30' | Sandstone - Red. Approx. 15% red shale. |
| 360' | 380' | 20' | Shale - Red to magenta. |
| 380' | 400' | 20' | Clay - Red, silty. |
| 400' | 500' | 100' | Shale - Red to magenta. Broken caliche pebbles. |
| 500' | 550' | 50' | Shale - Brown, a little grey. Approx. 2% caliche. |
| 550' | 660' | 110' | Shale - Brown, very little grey. Traces of caliche. |
| 660' | 720' | 60' | Shale - Brown. Some red clay. Trace caliche. |
| 720' | 750' | 30' | Shale - Brown, little grey. Trace caliche. |
| 750' | 810' | 60' | Siltstone - Red. Some brown shale. Very little green shale. |
| 810' | 890' | 80' | Shale - Red and brown, silty. Trace of caliche and green shale. |
| 890' | 900' | 10' | Clay - Red, sandy. Trace of gypsum. |
| 900' | 960' | 60' | Anhydrite - Grey, some gypsum. Approx. 20% red clay. |
| 960' | 1010' | 50' | Anhydrite - Dark grey. A little brown and grey clay. |
| 1010' | 1080' | 70' | Shale - Red. Approx. 20% gypsum and anhydrite. |
| 1080' | 1100' | 20' | Shale - Red. Approx. 40% gypsum and anhydrite. |
| 1100' | 1110' | 10' | Shale - Red. Approx. 10% gypsum and anhydrite. |

Farmers 20-F

| From | To | Inter | Formation |
|---|---|---|---|
| 1110' | 1130' | 20' | Gypsum and anhydrite - Approx. 5% red shale. |
| 1130' | 1150' | 20' | Anhydrite - Grey. Set casing at 1132' 10". |
| 1150' | 1170' | 20' | Limestone - Tan. A little grey anhydrite. (Culebra). |
| 1170' | 1180' | 10' | Clay - Red and grey. |
| 1180' | 1200' | 20' | Halite - Approx. 20% brown clay. |
| 1200' | 1236' | 36' | Halite - Approx. 4% brown clay. |
| | 1236' | | Start coring - 2-23-53. |
| 1236' 0" | 1239' 4" | 3' 4" | Halite - Clear to faint orange. Occasional bleb of orange polyhalite. Approx. 2% brown clay. |
| 1239' 4" | 1240' 4" | 1' 0" | Clay - Red, silty. Approx. 15% halite. |
| 1240' 4" | 1247' 6" | 7' 2" | Halite - Clear, medium grained. Approx. 40% red siltstone. |
| 1247' 6" | 1251' 2" | 3' 8" | Siltstone - Red. Approx. 5% halite. |
| 1251' 2" | 1253' 1" | 1' 11" | Halite - Clear, medium grained. Approx. 40% red and grey siltstone. |
| 1253' 1" | 1257' 2" | 4' 1" | Siltstone - Red. A few halite crystals, more prominent in the top 2'. |
| 1257' 2" | 1264' 4" | 7' 2" | Clay - Red, silty. Occasional carnallite and halite bleb. |
| 1264' 4" | 1266' 4" | 2' 0" | Siltstone - Brown. Numerous small carnallite blebs. |
| 1266' 4" | 1267' 2" | 0' 10" | Anhydrite - Grey. A few small carnallite blebs. A few halite crystals. |
| 1267' 2" | 1268' 0" | 0' 10" | Siltstone - Red. Numerous small carnallite blebs. A few halite crystals. |
| 1268' 0" | 1271' 2" | 3' 2" | Anhydrite - Grey and grey clay. A few halite crystals. Red, silty clay seams at 1268' 4" and 1269' 8". |
| 1271' 2" | 1271' 6" | 0' 4" | Clay - Red, silty. A few halite and carnallite blebs. |
| 1271' 6" | 1272' 5" | 0' 11" | Clay - Brownish grey. Some grey anhydrite. A few halite and carnallite blebs. |
| 1272' 5" | 1272' 10" | 0' 5" | Halite - and brown clay. Scattered carnallite blebs. |
| 1272' 10" | 1273' 1" | 0' 3" | Clay - Green. A few halite and carnallite blebs. (12th ore zone). |

LOGS OF EXPLORATORY HOLES
LARRY FELKINS, DRILLER

---

TEST HOLE #1
20.32.27.424443
LS ELEV. 3553
DRILLED: 10/31/89

0-12 CALICHE
12-24 SAND COARSE
24-28 SAND & GRAVEL
28-34 SAND FINE
34-39 SAND LIGHT
39-41 RED BED
41-44 GRAY ROCK
44-97 THIN LAYERS SAND & GRAVEL RED SAND GRAY ROCK SANDY YELLOW GRAY & BROWN CLAY (DRY)

TEST HOLE #2
20.32.27.422221
LS ELEV. 3546
DRILLED: 10/31/89

0- 8 CALICHE
8-28 SAND
28-32 SAND & GRAVEL
32-36 GRAY ROCK
36-38 SAND & GRAVEL
38-50 RED BED (DRY)

TEST HOLE #3
20.32.27.234210
LS ELEV. 3542
DRILLED: 10/31/89

0-12 CALICHE
12-34 SAND THIN LAYERS GRAVEL
34-50 RED BED (DRY)

TEST HOLE #4
20.32.27.412333
LS ELEV. 3550
DRILLED: 10/31/89

0- 8 CALICHE
8-39 SAND & GRAVEL
39-42 RED BED
42-60 LAYERS RED, YELLOW, GRAY SANDY CLAY WITH SOME GRAVEL LAYER OF GRAY ROCK (DRY)

TEST HOLE #5
20.32.27.144133
LS ELEV. 3539
DRILLED: 10/31/89

0- 2 CALICHE
2-24 SAND DAMP AT 18 DOWN
24-28 SAND & GRAVEL
28-34 SAND
34-36 GREEN CLAY
36-40 RED SAND & RED BED DAMP
40-44 RED BED DRY
44-46 GRAY CLAY
46-60 LAYERS OF RED BED GRAY CLAY GREEN CLAY (WATER AT 21 FT.)

TEST HOLE #6
20.32.27.132121
LS ELEV. 3529
DRILLED: 10/31/89

0-12 CALICHE
12-24 SAND THIN GRAVEL
24-32 SAND & GRAVEL WET
32-34 GRAY CLAY
34-36 RED BED
36-38 GREEN & GRAY CLAY
38-50 RED BED (WATER AT 26 FT.)

TEST HOLE #7
20.32.27.314122
LS ELEV. 3541
DRILLED: 10/31/89

0- 9 CALICHE
9-28 SAND LIGHT
28-35 SAND DARK
35-37 RED BED
37-38 GRAY CLAY
38-40 SAND THIN LAYERS CLAY
40-50 RED BED THIN LAYERS GRAY & GREEN CLAY (WATER AT 47 FT.)

TEST HOLE #1a
20.32.28.222224
LS ELEV. 3519
DRILLED: 01/26/90

0- 8 CALICHE
8-24 SAND & CLAY
24-28 GRAVEL & SAND
28-34 CLAYS YELLOW & BROWN
34-37 RED BED
CASED 37 FT. PERFS 29 FT.

TEST HOLE #2a
20.32.22.322142
LS ELEV. 3527
DRILLED: 01/26/90

0- 6 CALICHE
6-10 SAND
10-20 SAND CLAY ROCK
20-35 RED CLAY & SAND
35-45 RED CLAY & GRAVEL
45-55 RED BED
CASED 50 FT. PERFS BOTTOM 30 FT.

TEST HOLE #3a
20.32.28.243123
LS ELEV. 3522
DRILLED: 01/26/90

0- 8 CALICHE
8-20 CALICHE SAND GRAVEL
20-45 DRY BROWN & RED CLAY
45-55 RED BED
CASED 55 FT. PERFS 40 FT.

LOGS OF EXPLORATORY HOLES
BASED ON INSPECTION OF DRILL CUTTINGS

TEST HOLE #1
20.32.27.424443
LS ELEV. 3553
DRILLED: 10/31/89

| | |
|---|---|
| 0- 5 | CALICHE |
| 5-10 | CALICHE |
| 10-15 | CALICHE-FINE SAND |
| 15-20 | SAND CALICHE |
| 20-25 | SAND |
| 25-30 | SAND |
| 30-35 | NO SAMPLE |
| 35-40 | SAND GRAVEL |
| 40-45 | RED CLAY |
| 45-50 | RED BED |
| 50-55 | VERY FINE SILTY SAND |
| 55-60 | SILTY SAND-GREY SHALE -TRACE OF GRAVEL |
| 60-65 | SAND |
| 65-70 | GREY SILTSTONE |
| 70-75 | RED CLAY W/TRACE OF GRAVEL |
| 75-80 | RED SHALE |
| 80-85 | RED CLAY W/SOME SAND |
| 85-90 | RED CLAY |
| 90-95 | RED CLAY |
| 95-99 | NO SAMPLE |

TEST HOLE #2
20.32.27.422221
LS ELEV. 3546
DRILLED: 10/31/89

| | |
|---|---|
| 0- 5 | CALICHE |
| 5-10 | CALICHE |
| 10-15 | FINE SAND |
| 15-20 | FINE SAND W/SMALL GRAVEL |
| 20-25 | FINE SAND |
| 25-30 | FINE SAND |
| 30-35 | GREY SILTY SANDSTONE |
| 35-40 | RED BED W/TRACE OF GRAVEL |
| 40-45 | RED BED |
| 45-50 | RED BED |

TEST HOLE #3
20.32.27.234210
LS ELEV. 3542
DRILLED: 10/31/89

| | |
|---|---|
| 0- 5 | SAND AND CALICHE |
| 5-10 | CALICHE W/SOME SAND |
| 10-15 | CALICHE |
| 15-20 | SAND |
| 20-25 | CALICHE AND VERY FINE SAND |
| 25-30 | SAND-GRAVEL |
| 30-35 | RED SHALE W/TRACE OF GRAVEL |
| 35-40 | RED BED W/SOME GRAVEL |
| 40-45 | RED BED |
| 45-50 | RED BED |

TEST HOLE #4
20.32.27.412333
LS ELEV. 3550
DRILLED: 10/31/89

| | |
|---|---|
| 0- 5 | CALICHE |
| 5-10 | CALICHE |
| 10-15 | SAND W/SOME CALICHE |
| 15-20 | SAND & GRAVEL W/SOME CALICHE |
| 20-25 | SAND |
| 25-30 | SAND AND GRAVEL |
| 30-35 | BROWN SAND AND GRAVEL |
| 35-40 | CLAY AND SAND |
| 40-45 | RED AND GREY CLAY |
| 45-50 | GREY CLAYEY SAND W/SOME GREY SHALE |
| 50-55 | RED BED W/SOME GRAVEL (SILTSTONE) |
| 55-60 | GREY CLAY AND SAND W/SOME CHERT |

TEST HOLE #5
20.32.27.144133
LS ELEV. 3539
DRILLED: 10/31/89

| | |
|---|---|
| 0-10 | SOIL-CALICHE |
| 10-20 | CALICHE AND SAND |
| 20-30 | SAND AND GRAVEL |
| 30-35 | GREY SILTY SAND |
| 35-40 | GREY CLAY |
| 40-45 | RED CLAY |
| 45-50 | RED AND GREY CLAY W/SOME GRAVEL |
| 50-55 | RED BED |
| 55-60 | RED BED |

TEST HOLE #6
20.32.27.132121
LS ELEV. 3529
DRILLED: 10/31/89

| | |
|---|---|
| 0-10 | CALICHE |
| 10-20 | CALICHE SAND W/SOME GRAVEL |
| 20-30 | VERY FINE SAND W/SOME GRAVEL |
| 30-40 | RED BED W/SOME FINE SAND & TRACE OF GRAVEL |
| 40-45 | RED BED |
| 45-50 | RED BED |

LOGS OF EXPLORATORY HOLES
BASED ON INSPECTION OF DRILL CUTTINGS

CONTINUED

TEST HOLE #7
20.32.27.314122
LS ELEV. 3541
DRILLED: 10/31/89

| | |
|---|---|
| 0-10 | CALICHE |
| 10-20 | SAND |
| 20-30 | VERY FINE SAND W/SOME RED CLAY |
| 30-35 | NO SAMPLE |
| 35-40 | RED BED |
| 40-45 | RED BED |
| 45-50 | RED SILT (LIGHT COLORED) |

TEST HOLE #1a
20.32.28.222224
LS ELEV. 3519
DRILLED: 01/26/90

| | |
|---|---|
| 0- 5 | CALICHE |
| 5-10 | CALICHE W/SOME SAND |
| 10-15 | SAND & CLAY W/SOME SANDSTONE |
| 15-20 | SAND AND CLAY W/SOME GRAVEL |
| 20-25 | GREY & YELLOW CLAY |
| 25-30 | BROWN SAND AND GRAVEL |
| 30-35 | RED BED |
| 35-37 | RED BED |

TEST HOLE #2a
20.32.22.322142
LS ELEV. 3527
DRILLED: 01/26/90

| | |
|---|---|
| 0- 5 | CALICHE |
| 5-10 | CALICHE W/TRACE OF SAND |
| 10-15 | CALICHE W/SOME SAND |
| 15-20 | RED CLAY |
| 20-25 | RED CLAY - CALICHE |
| 25-30 | RED CLAY |
| 30-35 | RED CLAY W/SOME SAND |
| 35-40 | SAND AND CLAY |
| 40-45 | SAND-GRAVEL RED CLAY |
| 45-50 | RED BED - DARK RED |
| 50-55 | RED BED - DARK RED |

TEST HOLE #3a
20.32.28.243123
LS ELEV. 3522
DRILLED: 01/26/90

| | |
|---|---|
| 0- 5 | CALICHE |
| 5-10 | SAND AND CALICHE |
| 10-15 | SAND GRAVEL W/SOME CLAY |
| 15-20 | SAND GRAVEL W/SOME CLAY |
| 20-25 | RED CLAY |
| 25-30 | RED CLAY |
| 30-35 | RED CLAY |
| 35-40 | RED CLAY W/TRACE OF GRAVEL |
| 40-45 | RED CLAY |
| 45-50 | DARK RED CLAY |
| 50-55 | NO SAMPLE |

# A P P E N D I X  " B "

City of Hobbs
300 N Turner
Hobbs, NM 88240

# MICROBIOLOGICAL WATER REPORT

RECEIVED FEB 6 1990 CITY OF HOBBS N.M. UTILITIES W.W.T.P.

Time Test Started 1:30 Date FEB 6 1990

Time Test Ended 1:30 Date FEB 7 1990

## SAMPLE IDENTIFICATION

Quality Control No.: 90D-9

County: LEA

Water Supply System Name: 37 miles W of Hobbs on 62-180

WSS Code No.:

### COLLECTION INFORMATION

| Date Collected Mo. Day Yr. | Time Collected | Collected By |
|---|---|---|
| 2-6-90 | 9:00 | Denny |

Collection Point: Ho Well #2A

### TYPE OF SYSTEM

Check One

- [ ] Public Non-Community
- [ ] Swimming Pool
- [ ] Public Community
- [x] Private Well

Disinfected [ ] Yes [x] No

Residual: _____ mg/l (required for fecal test)

### REASON FOR SAMPLING

Check One

- [x] Routine Sample
- [ ] Special Sample
- [ ] Check Sample
- [ ] Monitor Sample

### TESTING REQUIRED

Check One

- [x] Potability (MF)-Sample required for Safe Drinking Water Act
- [ ] MPN

## RESULTS OF COLIFORM TESTING

Coliform per 100 ml

| TEST | Presumptive 24 hrs | Confirmed 48 hrs | Completed 48-72 hrs |
|---|---|---|---|
| MF | — | | |
| MPN | | | |

Non-Coliform per 100 ml

non-coliforms TNTC colonies

FOR INTERPRETATION OF RESULTS PLEASE CALL THE ENVIRONMENTAL IMPROVEMENT DIVISION AT 397-5250.

Bonnie Johnson
Bacteriologist

[ ] Unsatisfactory Sample

SEND REPORT AND BILL TO THE FOLLOWING

NAME Controlled Recovery Inc

COMPANY _____

ADDRESS Box 369
Hobbs, NM 88240

A FEE OF $10.00 PLUS TAX IS CHARGED FOR EACH TEST.

20.32.22.322142 JRW

OFFICE USE ONLY

City of Hobbs
300 N Turner
Hobbs, NM 88240

# MICROBIOLOGICAL WATER REPORT

RECEIVED
FEB 6 1990
CITY OF HOBBS N.M.
UTILITIES
W.W.T.P.

Time Test Started 1:30 Date FEB 6 1990

Time Test Ended 1:30 Date FEB 7 1990

## SAMPLE IDENTIFICATION

Quality Control No. 90 D-12

County LEA

Water Supply System Name 37 miles W of Hobbs on 62-180

WSS Code No.

## COLLECTION INFORMATION

| Date Collected Mo. Day Yr. | Time Collected | Collected By |
|---|---|---|
| 2-6-90 | 10:15 | Danny |

Collection Point At Well #6

## TYPE OF SYSTEM

Check One

[ ] Public Non-Community [ ] Swimming Pool

[ ] Public Community [X] Private Well

Disinfected [ ] Yes [X] No

Residual: _____ mg/l (required for fecal test)

## REASON FOR SAMPLING

Check One

[X] Routine Sample [ ] Special Sample

[ ] Check Sample [ ] Monitor Sample

## TESTING REQUIRED

Check One

[X] Potability (MF)-Sample required for Safe Drinking Water Act

[ ] MPN

## RESULTS OF COLIFORM TESTING

Coliform per 100 ml

| TEST | Presumptive 24 hrs | Confirmed 48 hrs | Completed 48-72 hrs |
|---|---|---|---|
| MF | — | | |
| MPN | | | |

Non-Coliform per 100 ml

non-coliforms TNTC colonies

FOR INTERPRETATION OF RESULTS PLEASE CALL THE ENVIRONMENTAL IMPROVEMENT DIVISION AT 397-5250.

Bonnie Johnson
Bacteriologist

[ ] Unsatisfactory Sample

_____

_____

_____

_____

SEND REPORT AND BILL TO THE FOLLOWING

NAME Controlled Recovery Inc

COMPANY _____

ADDRESS Bx 369

Hobbs, NM 88240

397-1621

A FEE OF $10.00 PLUS TAX IS CHARGED FOR EACH TEST.

20.32.27 132121 J.Ja

OFFICE USE ONLY

account #

City of Hobbs
300 N Turner
Hobbs, NM 88240

# MICROBIOLOGICAL WATER REPORT

RECEIVED
FEB 6 1990
CITY OF HOBBS N.M.
UTILITIES
W.W.T.P.

Time Test Started 1:30 Date FEB 6 1990

Time Test Ended 1:30 Date FEB 7 1990

## SAMPLE IDENTIFICATION

Quality Control No. 90 D -13

County LEA

Water Supply System Name 37 miles W of Hobbs on 62-180

WSS Code No.

## COLLECTION INFORMATION

| Date Collected Mo. Day Yr. | Time Collected | Collected By |
|---|---|---|
| 2-6-90 | 9:45 | Denny |

Collection Point At Well #5

## TYPE OF SYSTEM

Check One

[ ] Public Non-Community [ ] Swimming Pool

[ ] Public Community [✓] Private Well

Disinfected [ ] Yes [✓] No

Residual: _____ mg/l (required for fecal test)

## REASON FOR SAMPLING

Check One

[✓] Routine Sample [ ] Special Sample

[ ] Check Sample [ ] Monitor Sample

## TESTING REQUIRED

Check One

[✓] Potability (MF)-Sample required for Safe Drinking Water Act

[ ] MPN

## RESULTS OF COLIFORM TESTING

Coliform per 100 ml

| TEST | Presumptive 24 hrs | Confirmed 48 hrs | Completed 48-72 hrs |
|---|---|---|---|
| MF | — | | |
| MPN | | | |

Non-Coliform per 100 ml

non-coliforms TNTC colonies

FOR INTERPRETATION OF RESULTS PLEASE CALL THE ENVIRONMENTAL IMPROVEMENT DIVISION AT 397-5250.

Bacteriologist

[ ] Unsatisfactory Sample

_____

_____

_____

_____

SEND REPORT AND BILL TO THE FOLLOWING

NAME _____

COMPANY Controlled Recovery Inc

ADDRESS Box 369

Hobbs, NM 88240

PHONE 397-1571

A FEE OF $10.00 PLUS TAX IS CHARGED FOR EACH TEST.

20.32.27.144133 JLW

OFFICE USE ONLY

City of Hobbs
300 N Turner
Hobbs, NM 88240

# MICROBIOLOGICAL WATER REPORT

RECEIVED
FEB 6 1990
CITY OF HOBBS N.M.
UTILITIES
W.W.T.P.

Time Test Started 1:30 Date FEB 6 1990

Time Test Ended 1:30 Date FEB 7 1990

## SAMPLE IDENTIFICATION

Quality Control No. 90-0-11

County LEA

Water Supply System Name 37 miles W of Hobbs on 62-180

WSS Code No.

## COLLECTION INFORMATION

| Date Collected Mo. Day Yr. | Time Collected | Collected By |
|---|---|---|
| 2-6-90 | 9:30 | Remmy |

Collection Point At Well #3

## TYPE OF SYSTEM

Check One

[ ] Public Non-Community [ ] Swimming Pool

[ ] Public Community [X] Private Well

Disinfected [ ] Yes [X] No

Residual: _____ mg/l (required for fecal test)

## REASON FOR SAMPLING

Check One

[X] Routine Sample [ ] Special Sample

[ ] Check Sample [ ] Monitor Sample

## TESTING REQUIRED

Check One

[X] Potability (MF)-Sample required for Safe Drinking Water Act

[ ] MPN

## RESULTS OF COLIFORM TESTING

Coliform per 100 ml

| TEST | Presumptive 24 hrs | Confirmed 48 hrs | Completed 48-72 hrs |
|---|---|---|---|
| MF | — | | |
| MPN | | | |

Non-Coliform per 100 ml

non-coliforms TNTC colonies

FOR INTERPRETATION OF RESULTS PLEASE CALL THE ENVIRONMENTAL IMPROVEMENT DIVISION AT 397-5250.

Bacteriologist

[ ] Unsatisfactory Sample

_____

_____

_____

_____

SEND REPORT AND BILL TO THE FOLLOWING

NAME _____

COMPANY Controlled Recovery Inc

ADDRESS Box 3369

Hobbs, NM 88240

A FEE OF $10.00 PLUS TAX IS CHARGED FOR EACH TEST.

20.32.27.234210 JW

OFFICE USE ONLY

City of Hobbs
300 N Turner
Hobbs, NM 88240

# MICROBIOLOGICAL WATER REPORT

RECEIVED
FEB 6 1990
CITY OF HOBBS N.M.
UTILITIES
W.W.T.P.

Time Test Started 1:30 Date FEB 6 1990

Time Test Ended 1:30 Date FEB 7 1990

## SAMPLE IDENTIFICATION

Quality Control No.: 90 D - 10

County: LEA

Water Supply System Name: 37 miles W of Hobbs on 62-180

WSS Code No.:

## COLLECTION INFORMATION

| Date Collected Mo. Day Yr. | Time Collected | Collected By |
|---|---|---|
| 2-6-90 | 10:00 | Denny |

Collection Point: At Well #7

## TYPE OF SYSTEM

Check One

- [ ] Public Non-Community
- [ ] Swimming Pool
- [ ] Public Community
- [x] Private Well
- Disinfected [ ] Yes [x] No
- Residual: _____ mg/l (required for fecal test)

## REASON FOR SAMPLING

Check One

- [x] Routine Sample
- [ ] Special Sample
- [ ] Check Sample
- [ ] Monitor Sample

## TESTING REQUIRED

Check One

- [x] Potability (MF)-Sample required for Safe Drinking Water Act
- [ ] MPN

## RESULTS OF COLIFORM TESTING

Coliform per 100 ml

| TEST | Presumptive 24 hrs | Confirmed 48 hrs | Completed 48-72 hrs |
|---|---|---|---|
| MF | — | | |
| MPN | | | |

Non-Coliform per 100 ml

non-coliforms TNTC colonies

FOR INTERPRETATION OF RESULTS PLEASE CALL THE ENVIRONMENTAL IMPROVEMENT DIVISION AT 397-5250.

Norma Johnson
Bacteriologist

[ ] Unsatisfactory Sample

_____

_____

_____

_____

SEND REPORT AND BILL TO THE FOLLOWING

NAME _____

COMPANY Controlled Recovery Inc

ADDRESS Box 369

Hobbs, NM 88240

397-1621

A FEE OF $10.00 PLUS TAX IS CHARGED FOR EACH TEST.

20.32.27.314122 JDH

OFFICE USE ONLY

City of Hobbs
300 N Turner
Hobbs, NM 88240

# MICROBIOLOGICAL WATER REPORT

RECEIVED FEB 15 1990 CITY OF HOBBS N.M. UTILITIES W.W.T.P.

Time Test Started 1:30 Date FEB 15 1990

Time Test Ended 1:30 Date FEB 16 1990

FCD

| SAMPLE IDENTIFICATION | |
|---|---|
| Quality Control No. 90C-96 | County LEA |
| Water Supply System Name 37 miles west of Hobbs on 62-180 | WSS Code No. |

| COLLECTION INFORMATION | | |
|---|---|---|
| Date Collected Mo. Day Yr. | Time Collected | Collected By |
| 2-14-90 | 5:00pm | Denny |
| | Collection Point Hobbs Well #8 | |

**TYPE OF SYSTEM**

Check One

[ ] Public Non-Community [ ] Swimming Pool

[ ] Public Community [X] Private Well

Disinfected [ ] Yes [X] No

Residual: _____ mg/l (required for fecal test)

**REASON FOR SAMPLING**

Check One

[X] Routine Sample [ ] Special Sample

[ ] Check Sample [ ] Monitor Sample

**TESTING REQUIRED**

Check One

[X] Potability (MF)-Sample required for Safe Drinking Water Act

[ ] MPN

**RESULTS OF COLIFORM TESTING**

Coliform per 100 ml

| TEST | Presumptive 24 hrs | Confirmed 48 hrs | Completed 48-72 hrs |
|---|---|---|---|
| MF | — | | |
| MPN | | | |

Non-Coliform per 100 ml

non-coliforms TNTC colonies

FOR INTERPRETATION OF RESULTS PLEASE CALL THE ENVIRONMENTAL IMPROVEMENT DIVISION AT 397-5250.

Anne Johnson

Bacteriologist

[ ] Unsatisfactory Sample

_____

_____

_____

_____

SEND REPORT AND BILL TO THE FOLLOWING

NAME Controlled Recovery Inc

COMPANY _____

ADDRESS Bx 369

Hobbs, NM 88240

PHONE 397-6521

A FEE OF $10.00 PLUS TAX IS CHARGED FOR EACH TEST.

20.32.27.32142 3 JJW

OFFICE USE ONLY

City of Hobbs
300 N Turner
Hobbs, NM 88240

# MICROBIOLOGICAL WATER REPORT

RECEIVED FEB 6 1990 CITY OF HOBBS N.M. UTILITIES W.W.T.P.

Time Test Started 1:30 Date FEB 6 1990

Time Test Ended 1:30 Date FEB 7 1990

| SAMPLE IDENTIFICATION | |
|---|---|
| Quality Control No. 90-D 8 | County LEA |
| Water Supply System Name 37 miles west of Hobbs | WSS Code No. DAJ 62180 |

| COLLECTION INFORMATION | | |
|---|---|---|
| Date Collected Mo. Day Yr. | Time Collected | Collected By |
| 2-6-90 | 8:45 | Denny |
| | Collection Point: At Well #1A | |

**TYPE OF SYSTEM**

Check One

- [ ] Public Non-Community
- [ ] Swimming Pool
- [ ] Public Community
- [x] Private Well

Disinfected [ ] Yes [x] No

Residual: _____ mg/l (required for fecal test)

**REASON FOR SAMPLING**

Check One

- [x] Routine Sample
- [ ] Special Sample
- [ ] Check Sample
- [ ] Monitor Sample

**TESTING REQUIRED**

Check One

- [x] Potability (MF)-Sample required for Safe Drinking Water Act
- [ ] MPN

**RESULTS OF COLIFORM TESTING**

Coliform per 100 ml

| TEST | Presumptive 24 hrs | Confirmed 48 hrs | Completed 48-72 hrs |
|---|---|---|---|
| MF | — | | |
| MPN | | | |

Non-Coliform per 100 ml

non-coliforms TNTC colonies

FOR INTERPRETATION OF RESULTS PLEASE CALL THE ENVIRONMENTAL IMPROVEMENT DIVISION AT 397-5250.

Bacteriologist

[ ] Unsatisfactory Sample

_____

_____

_____

_____

SEND REPORT AND BILL TO THE FOLLOWING

NAME Controlled Recovery Inc

COMPANY _____

ADDRESS Box 369

Hobbs NM 88240

A FEE OF $10.00 PLUS TAX IS CHARGED FOR EACH TEST.

20.32.28.222224 Jw

OFFICE USE ONLY

City of Hobbs
300 N Turner
Hobbs, NM 88240

# MICROBIOLOGICAL WATER REPORT

RECEIVED
FEB 6 1990
CITY OF HOBBS N.M.
UTILITIES
W.W.T.P.

Time Test Started 1:30 Date FEB 6 1990

Time Test Ended 1:30 Date FEB 7 1990

## SAMPLE IDENTIFICATION

Quality Control No.: 90 D-14

County: LEA

Water Supply System Name: 37 miles W of Hobbs on 62-180

WSS Code No.:

## COLLECTION INFORMATION

| Date Collected Mo. Day Yr. | Time Collected | Collected By |
|---|---|---|
| 2-6-90 | 9:15 | Remy |

Collection Point: At Well #3A

## TYPE OF SYSTEM

Check One

[ ] Public Non-Community
[ ] Swimming Pool
[ ] Public Community
[X] Private Well

Disinfected [ ] Yes [X] No

Residual: _____ mg/l (required for fecal test)

## REASON FOR SAMPLING

Check One

[X] Routine Sample [ ] Special Sample
[ ] Check Sample [ ] Monitor Sample

## TESTING REQUIRED

Check One

[X] Potability (MF)-Sample required for Safe Drinking Water Act
[ ] MPN

## RESULTS OF COLIFORM TESTING

Coliform per 100 ml

| TEST | Presumptive 24 hrs | Confirmed 48 hrs | Completed 48-72 hrs |
|---|---|---|---|
| MF | — | | |
| MPN | | | |

Non-Coliform per 100 ml

non-coliforms TNTC colonies

FOR INTERPRETATION OF RESULTS PLEASE CALL THE ENVIRONMENTAL IMPROVEMENT DIVISION AT 397-5250.

Bonnie Johnson
Bacteriologist

[ ] Unsatisfactory Sample

_____

_____

_____

_____

SEND REPORT AND BILL TO THE FOLLOWING

NAME Controlled Recovery Inc

COMPANY _____

ADDRESS Box 369

Hobbs, NM 88240

PHONE 397-1521

A FEE OF $10.00 PLUS TAX IS CHARGED FOR EACH TEST.

20.32.28.243123 JDW

OFFICE USE ONLY

ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
HOBBS, NEW MEXICO

## WATER ANALYSIS REPORT FORM

WELL OWNERSHIP: Controlled Recovery Inc. WELL #: 2A

LAND STATUS: STATE _____ FEDERAL _____ FEE _____

WELL LOCATION: Unit Letter _____ Section 27 Township 20 Range 32

QUARTER/QUARTER - FOOTAGE LOCATION: _____

WELL TYPE: Moniter well DEPTH ? feet

WELL USE: _____

SAMPLE NUMBER: 1 TAKEN BY: Eddie Seay & Ken Marsh

DATE: 2/27/90

| | | |
|---|---|---|
| Specific Conductance: | 1700 | mh |
| Total dissolved solids: | 1190 | PPM |
| Chlorides: | 568 | PPM |
| Sulfates: | | PPM |

Ortho-phosphates: Very Low _____ Low _____ Med _____ Hi _____

Sulfides: None _____ Low _____ Med _____ Hi _____

OTHER:

DATE ANALYZED: 2/28/90 BY: Eddie (W) Seay

OIL CONSERVATION DIVISION
Eddie W. Seay

REMARKS: Sample taken at 44 feet.

Top of water at 38 feet.

5 ml sample 710 x .8 = 568 ppm Cl

SC - metered 1700

TDS - calculated

20.32.22.322/42

ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
HOBBS, NEW MEXICO

## WATER ANALYSIS REPORT FORM

WELL OWNERSHIP: Controlled Recovery Inc. WELL #: 6

LAND STATUS: STATE _____ FEDERAL _____ FEE _____

WELL LOCATION: Unit Letter _____ Section 27 Township 20 Range 32

QUARTER/QUARTER - FOOTAGE LOCATION: _____

WELL TYPE: Moniter Well DEPTH ? feet

WELL USE: _____

SAMPLE NUMBER: 1 TAKEN BY: Eddie Seay & Ken Marsh

DATE: 2/27/90

| | | |
|---|---|---|
| Specific Conductance: | 2750 | m/h |
| Total dissolved solids: | 1925 | PPM |
| Chlorides: | 866.1 | PPM |
| Sulfates: | | PPM |
| Ortho-phosphates: | Very Low _____ Low _____ Med _____ Hi _____ | |
| Sulfides: | None _____ Low _____ Med _____ Hi _____ | |
| OTHER: | | |

DATE ANALYZED: 2/28/90 BY: Eddie W Seay

OIL CONSERVATION DIVISION
Eddie W. Seay

REMARKS: Sample taken at 40 feet.
Top of water at 23 feet.
25 ml sample 142 x 6.1 titration = 866.1 ppm Cl
SC - metered 2750
TDS - calculated

20.32.27./32/21

ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
HOBBS, NEW MEXICO

## WATER ANALYSIS REPORT FORM

WELL OWNERSHIP: Controlled Recovery Inc. WELL #: 5

LAND STATUS: STATE ____ FEDERAL ____ FEE ____

WELL LOCATION: Unit Letter ____ Section 27 Township 20 Range 32

QUARTER/QUARTER - FOOTAGE LOCATION: ____ DEPTH ? feet

WELL TYPE: Moniter well

WELL USE: ____

SAMPLE NUMBER: 1 TAKEN BY: Eddie Seay & Ken Marsh

DATE: 2/27/90

Specific Conductance: 50,000+ m/h

Total dissolved solids: ?? PPM

Chlorides: 37,275 PPM

Sulfates: ____ PPM

Ortho-phosphates: Very Low ____ Low ____ Med ____ Hi ____

Sulfides: None ____ Low ____ Med ____ Hi ____

OTHER: ____

DATE ANALYZED: 2/28/90

BY: Eddie W Seay
OIL CONSERVATION DIVISION
Eddie W. Seay

REMARKS: Sample taken at 40 feet.
Top of water at 28 feet.
1 ml sample 3550 x 10.5 = 37,275 ppm Cl
SC - meter pegged out at 50,000+.

20.32.27.144133

ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
HOBBS, NEW MEXICO

## WATER ANALYSIS REPORT FORM

WELL OWNERSHIP: Controlled Recovery Inc. WELL #: 1A

LAND STATUS: STATE _____ FEDERAL _____ FEE _____

WELL LOCATION: Unit Letter _____ Section 27 Township 20 Range 32

QUARTER/QUARTER - FOOTAGE LOCATION: _____

WELL TYPE: Moniter well DEPTH ? feet

WELL USE: _____

SAMPLE NUMBER: 1 TAKEN BY: Eddie Seay & Ken Marsh

DATE: 2/27/90

| | | |
|---|---|---|
| Specific Conductance: | 50,000+ | mh |
| Total dissolved solids: | ?? | PPM |
| Chlorides: | 136,675 | PPM |
| Sulfates: | | PPM |

Ortho-phosphates: Very Low _____ Low _____ Med _____ Hi _____

Sulfides: None _____ Low _____ Med _____ Hi _____

OTHER: _____

DATE ANALYZED: 2/28/90 BY: Eddie W Seay
OIL CONSERVATION DIVISION
Eddie W. Seay

REMARKS: Sample taken at 35 feet.
Top of water at 20 feet.
1 ml sample 2550 x 38.5 titration = 136,675 ppm Cl
SC - meter pegged out at 50,000 plus.

20.32.28.222224

ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
HOBBS, NEW MEXICO

## WATER ANALYSIS REPORT FORM

WELL OWNERSHIP: Controlled Recovery Inc. WELL #: 3A

LAND STATUS: STATE _____ FEDERAL _____ FEE _____

WELL LOCATION: Unit Letter _____ Section 27 Township 20 Range 32

QUARTER/QUARTER - FOOTAGE LOCATION: _____

WELL TYPE: Moniter well DEPTH _____ feet

WELL USE: _____

SAMPLE NUMBER: 1 TAKEN BY: Eddie Seay & Ken Marsh

DATE: 2/27/90

| | | |
|---|---|---|
| Specific Conductance: | 50,000+ | m/h |
| Total dissolved solids: | ?? | PPM |
| Chlorides: | 95,850 | PPM |
| Sulfates: | | PPM |

Ortho-phosphates: Very Low _____ Low _____ Med _____ Hi _____

Sulfides: None _____ Low _____ Med _____ Hi _____

OTHER: _____

DATE ANALYZED: 2/28/90 BY: Eddie W Seay

OIL CONSERVATION DIVISION
Eddie W. Seay

REMARKS: Sample taken at 40 feet.
Top of water at 20 feet.
1 ml sample 3550 x 27 titration = 95,850 ppm Cl
SC - meter pegged out at 50,000 plus.

20.32.28.243/23