RECR-10
Windmill Oil

Internal OCD Memos
Incl.
2001Scope of Work

63261

SOW @ Windmill Oil

Contract +

- Review deliverables

- Chronologies
  - Data
  - ~~OCC~~
  - Production
  - Cog Surveys (Prevent)
  - Remediation - Production
  - Admin OCC
  - Admin OCD

Data

- Well Samples (CSC) → 2003 water quality
- Surveys → Surveys. (GIS)
- Production → Dynamac → MAP w/ BLM
- Maps
- X-sections
- Previous Reports

Q: Electronic submission

Q. Will survey → address → lab analyses @ 2001-03 also, print lab analyses

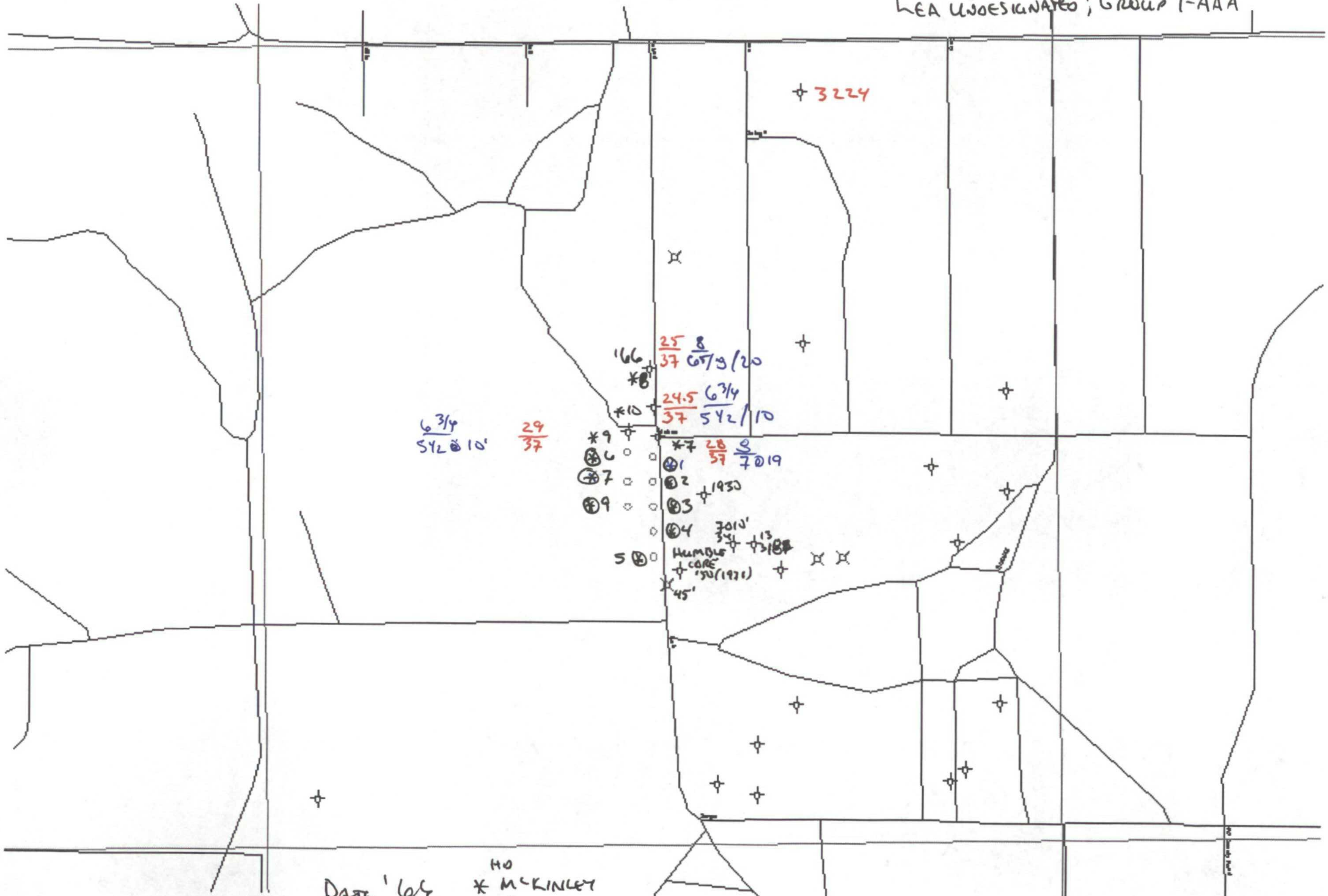
- Wells with logs
- SED

- 1957 OCC REPORT
- 1965 OCC CASE 3235 - CASE FILES NOT SCANNED
  ORDER R-2902

RBDMS Map

Pool 66033

LEA UNDESIGNATED; GROUP 1-AAA



Date '64

HO
* McKINLEY
Ⓢ SEED

MapNotes

PLUG / TD

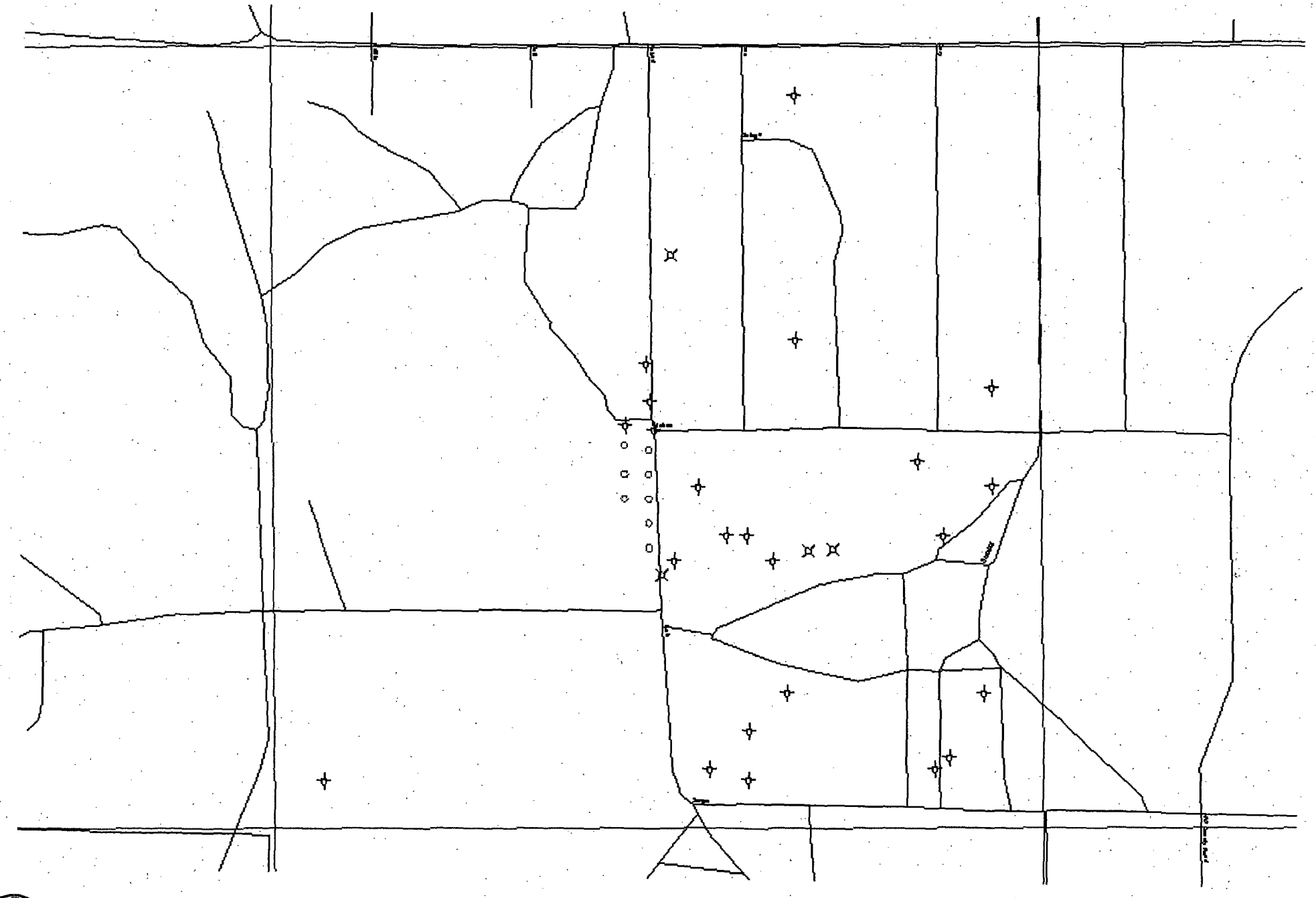
HOLE SIZE / CSG / DEPTH

Oil Conservation Division

DrawnBy

2/21/2005 11:23:16 AM

RBDMS Map



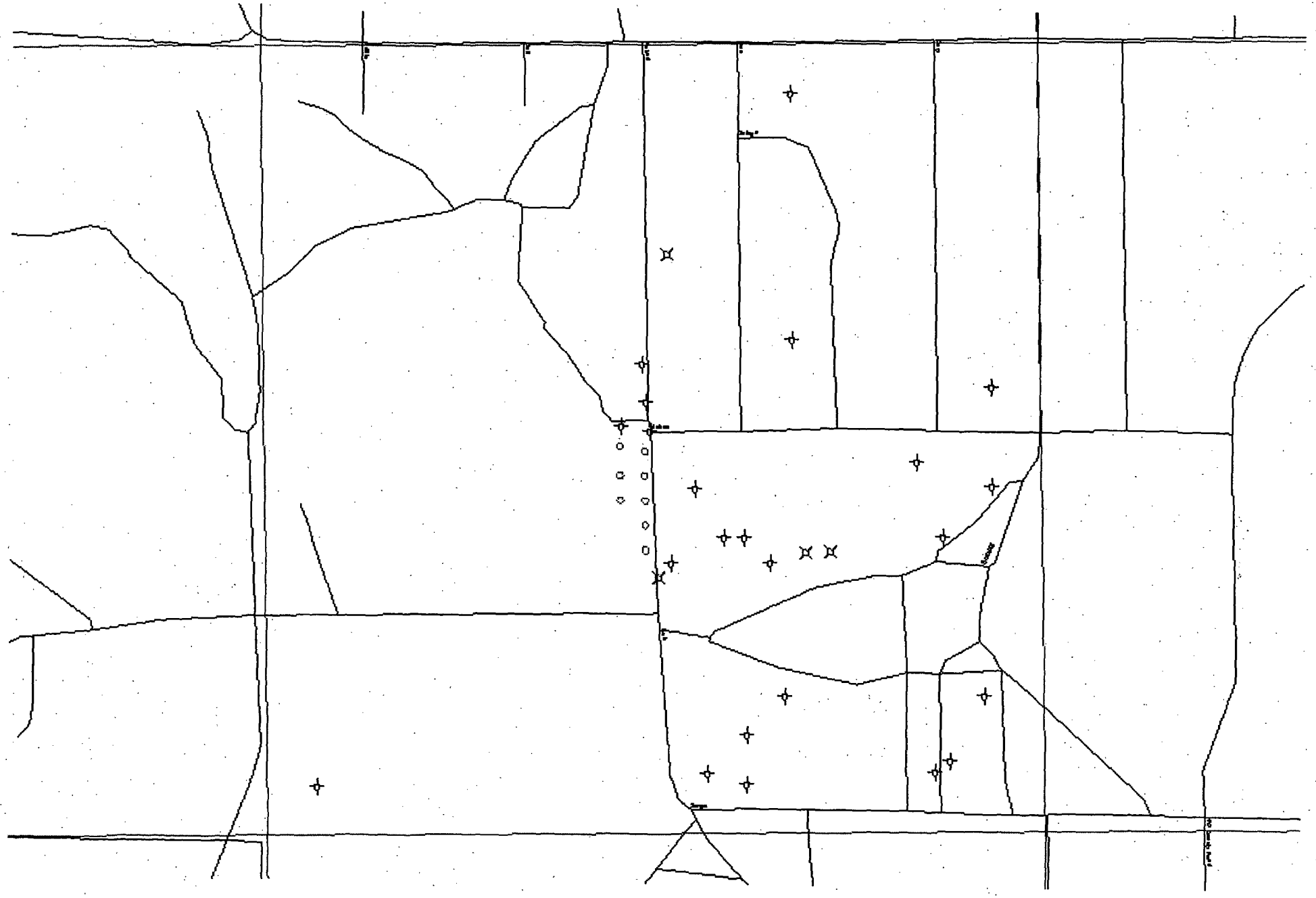
Oil Conservation Division

MapNotes

DrawnBy

2/21/2005 11:23:16 AM

RBDMS Map



Oil Conservation Division

MapNotes

DrawnBy

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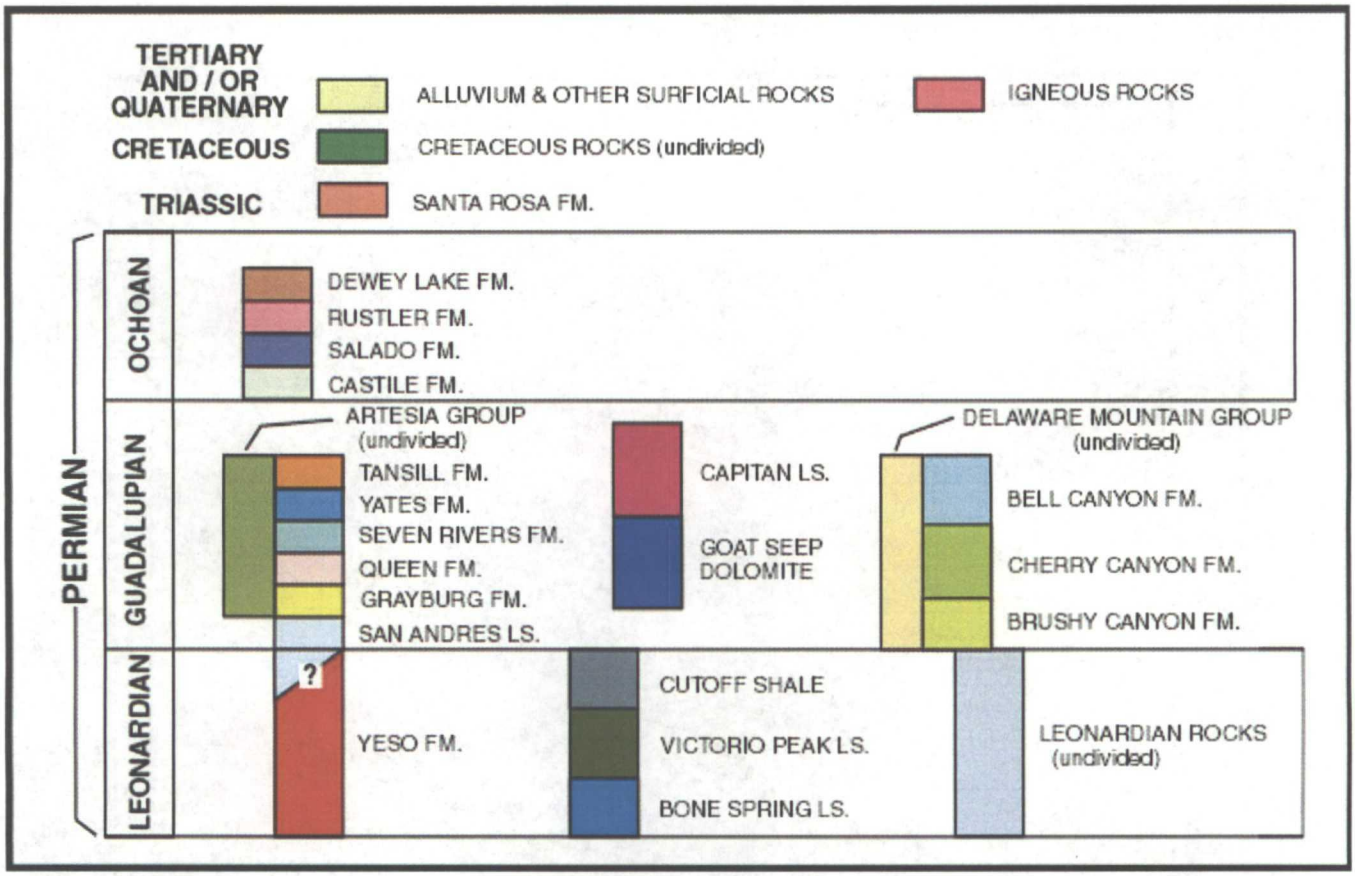
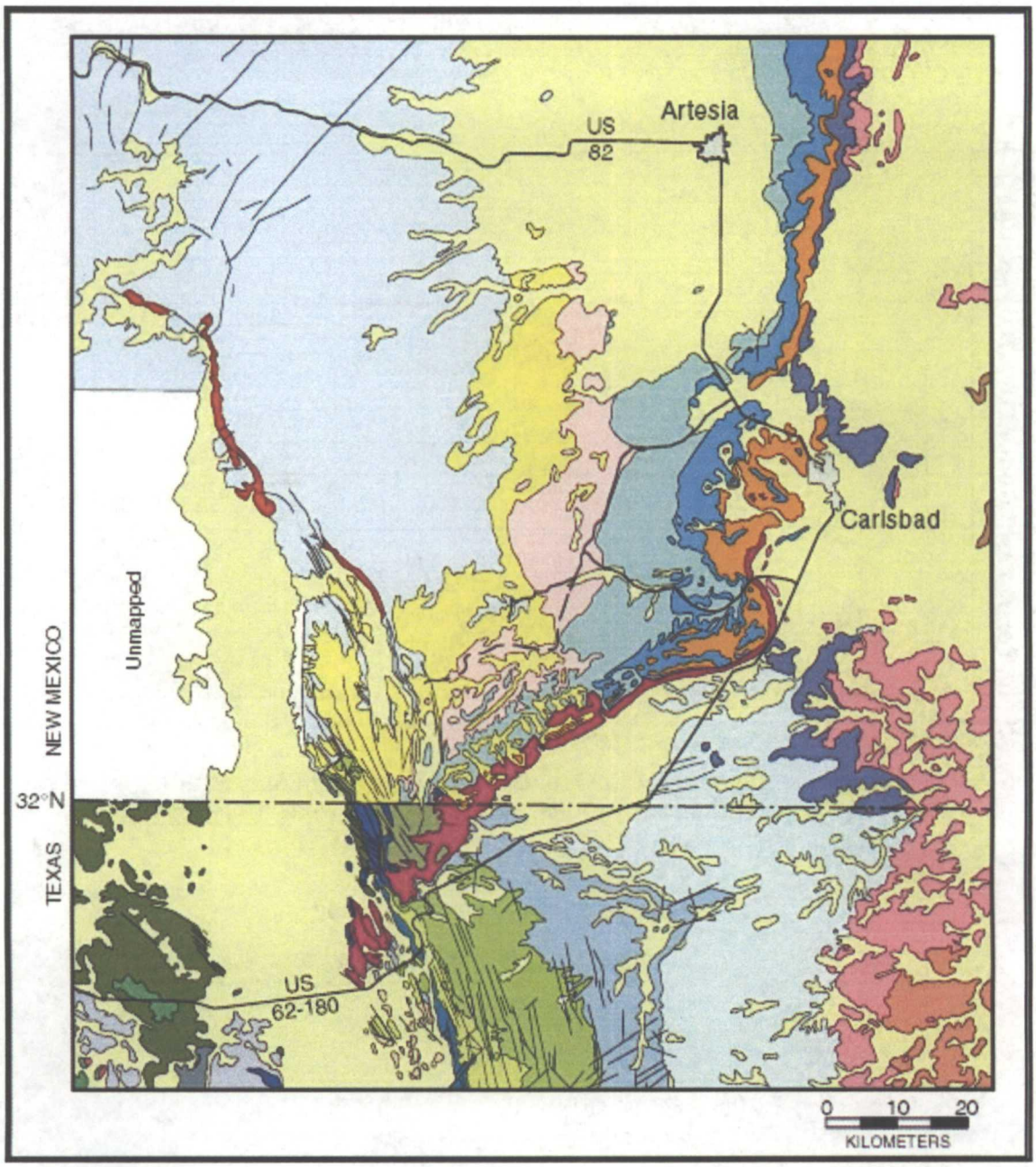


Generalized geologic map of the Guadalupe Mounts and surrounding areas. Compiled from numerous published sources, including Barnes (1968), Boyd (1958), Kelley (1971), King (1948), and Motts (1962).

Guadalupe Mtns. geology —El-Paso-Carlsbad Roadlog— Scholle home page — NM Bureau staff page — NM Bureau main page


Artesia
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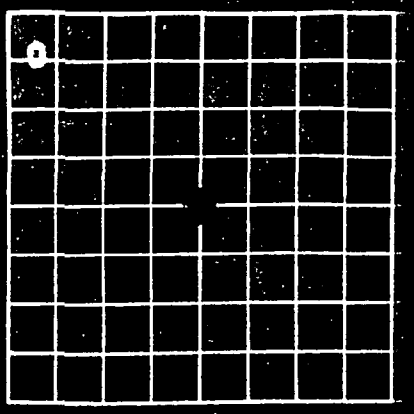
KILOMETERS

Form 9-330

U. S. Land Office Las Cruces
Serial Number 032233
Lease or Permit to Prospect B. A. Bowers

DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



LOCATE WELL CORRECTLY

LOG OF OIL OR GAS WELL

Company Humble Oil & Refining Co. Address McCamey, Texas

Lessor or Tract B. A. Bowers Field Hobbs State New Mexico

Well No. 2 Sec. SW/4 30 T. 18S R. 38E Meridian ____ County Lea

Location 330 ft. {N/S} of S Line and 330 ft. {E/W} of W Line of SW/4 Sec. 30 Elevation ____ (Derrick floor relative to sea level)

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

Signed COPY SIGNED DAVID FRAME

Date May 12, 1930 Title District Sup't.

The summary on this page is for the condition of the well at above date.

Commenced drilling 4-10-1930, 19____ Finished drilling 4-19-1930, 19____

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from ____ to ____ No. 4, from ____ to ____

No. 2, from ____ to ____ No. 5, from ____ to ____

No. 3, from ____ to ____ No. 6, from ____ to ____

IMPORTANT WATER SANDS

No. 1, from ____ to ____ No. 3, from ____ to ____

No. 2, from ____ to ____ No. 4, from ____ to ____

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated From	Perforated To	Purpose

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used

FOLD

PLUGS AND ADAPTERS

Heaving plug—Material ..... Length ..... Depth set .....

Adapters—Material ..... Size .....

SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out

TOOLS USED

Rotary tools were used from 0 feet to 106' T.D. feet, and from ..... feet to ..... feet

Cable tools were used from ..... feet to ..... feet, and from ..... feet to ..... feet

DATES

....., 19..... Put to producing ....., 19.....

The production for the first 24 hours was ..... barrels of fluid of which ..... % was oil; ..... % emulsion; ..... % water; and ..... % sediment. Gravity, °Bé. .....

If gas well, cu. ft. per 24 hours ..... Gallons gasoline per 1,000 cu. ft. of gas .....

Rock pressure, lbs. per sq. in. .....

EMPLOYEES

Norman Henry, Driller M. A. Bottcher, Driller

B. C. Ivers, Driller ....., Driller

FORMATION RECORD

FROM	TO	TOTAL FEET	FORMATION
0	50'	50'	Rock
50	100	50	Sand & Rock
100	106	6	Hard Sand Rock -
			Total Depth

FROM | TO | TOTAL FEET | FORMATION

FORMATION RECORD Continued

(OVER)

6—6745

B11

Form 9-331a
(Feb., 1926)

U. S. Land Office Las Cruces

Serial Number 032233-A

Lease or Permit B. A. Bowers

RECEIVED
MAY 14 1930
U. S. GEOLOGICAL SURVEY
ROSWELL, NEW MEXICO

DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL		SUBSEQUENT RECORD OF SHOOTING	
NOTICE OF INTENTION TO CHANGE PLANS		RECORD OF PERFORATING CASING	
NOTICE OF DATE FOR TEST OF WATER SHUT-OFF		NOTICE OF INTENTION TO PULL OR OTHERWISE ALTER CASING	
REPORT ON RESULT OF TEST OF WATER SHUT-OFF		NOTICE OF INTENTION TO ABANDON WELL	X
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL		SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO SHOOT		SUPPLEMENTARY WELL HISTORY	

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

McCamey, Texas. May 12, 1930, 192

Following is a {notice of intention to do work / report of work done} on land under {permit / lease} described as follows:

New Mexico (State or Territory) Lea (County or Subdivision) Hobbs (Field)

Well No. 2 SE¼ Sec. 30 (¼ Sec. and Sec. No.) 18-South (Twp.) 38-East (Range) (Meridian)

The well is located 330 ft. {N / S} of N line and 330 ft. {E / W} of W line of sec. SE¼ Sec. 30

The elevation of the derrick floor above sea level is ..... ft.

DETAILS OF PLAN OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work.)

Hole mudded from bottom (106') to 66' and cemented from 66' to bottom of cellar with 25 sacks cement. Cellar filled up and cemented with 15 sacks cement. One 10' joint of 9 5/8" casing set 5' in concrete, 5' protruding for permanent monument or marker. Condition around monument good.

Approved May 15, 1930 (Date)

E. A. Hanson

Title Deputy Supervisor
GEOLOGICAL SURVEY

Address Roswell, New Mexico.

Company Humble Oil & Refg. Co.

By COPY ORIGINAL SIGNED: DAVID FRAME

Title Division Sup't.

Address McCamey, Texas.

NOTE.—Reports on this form to be submitted in *triplicate* to the Supervisor for approval.

GOVERNMENT PRINTING OFFICE 6—7653

B-2

Form 9-331a
(Feb., 1926)

U.S. Land Office Las Cruces

Serial Number 032233

Lease or Permit B. A. Bowers

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

RECEIVED
APR 21 1930
U. S. GEOLOGICAL SURVEY
ROSWELL, NEW MEXICO

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL		SUBSEQUENT RECORD OF SHOOTING	
NOTICE OF INTENTION TO CHANGE PLANS		RECORD OF PERFORATING CASING	
NOTICE OF DATE FOR TEST OF WATER SHUT-OFF		NOTICE OF INTENTION TO PULL OR OTHERWISE ALTER CASING	
REPORT ON RESULT OF TEST OF WATER SHUT-OFF		NOTICE OF INTENTION TO ABANDON WELL	X
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL		SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO SHOOT		SUPPLEMENTARY WELL HISTORY	

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

McCamey, Texas. April 18, 1930, 192

Following is a {notice of intention to do work / ~~report of work done~~} on land under {~~permit~~ / lease} described as follows:

New Mexico (State or Territory) Lea (County or Subdivision) Hobbs (Field)

Well No. 2 SE 1/4 Sec. 30 (¼ Sec. and Sec. No.) 18-South (Twp.) 38-East (Range) (Meridian)

The well is located 330 ft. {N / S} of N line and 330 ft. {E / W} of W line of sec. SE 1/4 Sec. 3

The elevation of the derrick floor above sea level is ______ ft.

DETAILS OF PLAN OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work.)

Hole to be mudded from bottom (106') up to 66' and cemented from 66' to top.

APPROVAL CONDITIONED UPON

1. Cementing pipe of casing at surface as regulation marker. The pipe should extend about five feet above the surface, cemented in ground with cement plug at top.
2. After completion of plugging, submit three copies of Subsequent Report of Abandonment showing method of plugging used, nature of marker cemented at surface and condition of ~~premises~~ around the abandoned location.

Approved April 21, 1930 (Date)

E. A. Hanson

Title Deputy Supervisor, GEOLOGICAL SURVEY

Address Roswell, New Mexico.

Company Humble Oil & Refining Co.

By [signature]

Title Division Sup't.

Address McCamey, Texas.

NOTE.—Reports on this form to be submitted in *triplicate* to the Supervisor for approval.

GOVERNMENT PRINTING OFFICE: 6—7653

R15

Form 9-331a
(Feb., 1928)

U. S. Land Office Las Cruces

Serial Number 032233-A

Lease or Permit B. A. Bowers

DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL	X	SUBSEQUENT RECORD OF SHOOTING	
NOTICE OF INTENTION TO CHANGE PLANS		RECORD OF PERFORATING CASING	
NOTICE OF DATE FOR TEST OF WATER SHUT-OFF		NOTICE OF INTENTION TO PULL OR OTHERWISE ALTER CASING	
REPORT ON RESULT OF TEST OF WATER SHUT-OFF		NOTICE OF INTENTION TO ABANDON WELL	
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL		SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO SHOOT		SUPPLEMENTARY WELL HISTORY	

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

McCamey, Texas. April 3, 1930, 192

Following is a {notice of intention to do work / ~~report of work done~~} on land under {permit / lease} described as follows:

New Mexico (State or Territory) Lea (County or Subdivision) Hobbs (Field)

Well No. 2 SE 1/4 Sec. 30 (¼ Sec. and Sec. No.) 18-South (Twp.) 38-East (Range) (Meridian)

The well is located 330 ft. {N/S} of N line and 330 ft. {E/W} of W line of sec. SE 1/4 Sec. 30

The elevation of the derrick floor above sea level is ____ ft.

DETAILS OF PLAN OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work.)

12 1/2" -50# - 200' through water sand with 180 sacks cement.

9 5/8" -36# - 2750' on top of brown lime with 600 sacks cement.

7" -26# - 3960' on top of white lime with 600 sacks cement.

Approved April 8, 1930. (Date)

C. A. Hanson

Title Deputy Supervisor GEOLOGICAL SURVEY

Address Roswell, N. Mex.

Company Humble Oil & Refining Co.

By David Frame

Title Divisi on Sup't.

Address McCamey, Texas.

NOTE.—Reports on this form to be submitted in *triplicate* to the Supervisor for approval.

GOVERNMENT PRINTING OFFICE 6—7853

B16

APPROVAL TO DRILL is given as outlined above with the understanding that the following general and special requirements be strictly complied with:

GENERAL

1. All water to be confined to its original horizon and test made for water shut-off before drilling ahead. Casing shall be cemented if necessary to shut off water.

2. All showings of oil or gas to be tested for their commercial possibilities in a dry hole before drilling ahead. Each showing to be properly protected to prevent migration.

3. To prevent waste of, or damage to, and to provide the U. S. Geological Survey with carefully taken samples of, other minerals drilled through, i. e., coal, salt, potash beds, etc.

4. The permittee shall permanently mark all rigs or wells in a conspicuous place with his name or the name of the actual operator and the number and description of the well, and shall take all necessary precautions to preserve these markings.

5. Notify the U. S. Geological Survey office, P. O. Box 591, Roswell, New Mexico, on form 9-331a, of mudding, cementing, and water shut-off tests a sufficient time in advance in order that an engineer of the Survey may be present.

6. Lessee's monthly report, in triplicate on form 9-329, must be filled out each calendar month and forwarded to the Roswell office not later than the 6th day of the following month.

SPECIAL

1. Any change of drilling plan, or the conditions of approval, must have the written approval of the District Engineer before the change is made.

2. Carefully taken samples of drill cuttings must be taken at least every ten feet from 200 feet from surface to bottom of hole, and submitted through approved agent or directly to the U. S. Geological Survey, Roswell office.

3. The 7" casing to be set not higher than 50' above the 4100 foot pay, or at a point to be determined to be mutually agreed upon between geological department of Humble O. & R. Co. and the Deputy Supervisor.

B/6a

Form 9-331a
(Feb., 1926)

U. S. Land Office Las Cruces

Serial Number 032233

Lease or Permit B. A. Bowers

DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL	X	SUBSEQUENT RECORD OF SHOOTING	
NOTICE OF INTENTION TO CHANGE PLANS		RECORD OF PERFORATING CASING	
NOTICE OF DATE FOR TEST OF WATER SHUT-OFF		NOTICE OF INTENTION TO PULL OR OTHERWISE ALTER CASING	
REPORT ON RESULT OF TEST OF WATER SHUT-OFF		NOTICE OF INTENTION TO ABANDON WELL	
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL		SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO SHOOT		SUPPLEMENTARY WELL HISTORY	

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

McCamey, Texas. March 27, 1930, 192

Following is a {notice of intention to do work / ~~report of work done~~} on land under {permit / lease} described as follows:

New Mexico (State or Territory) Lea (County or Subdivision) Hobbs (Field)

Well No. 2 SE 1/4 Section 30 (¼ Sec. and Sec. No.) 18-South (Twp.) 38-East (Range) (Meridian)

The well is located 330 ft. {N / S} of N line and 330 ft. {E / W} of W line of sec. 30

The elevation of the derrick floor above sea level is ..... ft.

DETAILS OF PLAN OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work.)

We expect to set approximately 204'7" of 12 1/2" Casing and cement with 180 sacks. To set 2750' of 9 5/8" Casing and cement with 630 sacks. To set 3962' of 7" Casing and cement with 528 sacks.

Approved ..... (Date)

..... GEOLOGICAL SURVEY

Title .....

Address .....

Company Humble Oil & Refining Co.

By [signature]

Title Division Sup't.

Address McCamey, Texas.

NOTE.—Reports on this form to be submitted in *triplicate* to the Supervisor for approval.

GOVERNMENT PRINTING OFFICE 6—7053

B17

WINDMILL OIL INVESTIGATION
(February 13, 2004)

A. PURPOSE

To investigate and remediate ground water contamination at the Windmill Oil site west of Hobbs, New Mexico.

B. BACKGROUND INFORMATION

The Windmill Oil site is located in Sec 30, Township 18 South, Range 38 East, Hobbs, New Mexico. The Windmill Oil site is an area with extensive historical oil contamination of Ogallala formation ground water. Since the mid 1960's, approximately 100 wells were drilled into the ground water in the SE/4 of the NW/4, the S/2 of the NE/4, the NE/4 of the SE/4, and the NW/4 of the SE/4 of Section 30 by the Windmill Oil Company and several other individuals for the purposes of recovering fugitive oil from ground water for economic benefit. Originally, fugitive oil was produced from the top of the water table with windmills, and later by the use of submersible pumps. NMOCD records indicate that Windmill Oil Company produced approximately 425,000 barrels of oil from the ground water between 1965 and 1996. Approximately sixteen (16) feet of oil was measured on the water table in one former Windmill Oil Company well in June of 2000.

Since the 1960's a number of homes have been built in Section 30 within and north of area where oil is known to exist in the ground water. These homes are located outside of the area served by the City of Hobbs municipal water system. There are fifty-three (53) known private water wells that provide domestic water for these residences. These water wells are reported to be completed and draw ground water from the base of the Ogallala formation. There are a number of oil and gas production wells, oilfield flow lines and petroleum pipelines in the area. Depth to ground water at the site is estimated to be approximately 50-60 feet. The local ground water gradient is estimated to be toward the southeast. Investigation and remediation of ground water is necessary to determine and mitigate potential impacts to public health.

SCOPE OF WORK

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

NEW MEXICO OIL CONSERVATION DIVISION

GROUND WATER CONTAMINATION INVESTIGATION

WINDMILL OIL SITE

FEBRUARY 10, 2003

I. INTRODUCTION

A. PURPOSE

The State of New Mexico Oil Conservation Division of the Energy, Minerals and Natural Resources Department (NMOCD) is conducting an investigation to determine potential impacts to public and private water wells from petroleum contaminated ground water at the Windmill Oil site on the western side of Hobbs, New Mexico.

B. SUMMARY SCOPE OF WORK

The contractor shall perform the work necessary to determine potential impacts to public and private water wells in the area adjacent to the Windmill Oil site. The scope of work includes, but is not limited to:

1. conducting a door to door survey of water wells in the area;
2. GPS locating of water well locations not previously identified;
3. sampling ground water from water wells
4. preparation of an investigation report.

C. PROCUREMENT MANAGER

NMOCD has designated a Procurement Manager who is responsible for the conduct of this procurement whose name, address and telephone number are listed below.

William C. Olson
New Mexico Oil Conservation Division
1220 Saint Francis
Santa Fe, New Mexico 87505
Phone: 505-476-3491
Fax: 505-476-3462
e-mail: wolson@state.nm.us

All deliveries via express carrier should be addressed as above. Any inquiries or requests regarding this procurement should be submitted to the Procurement Manager in writing. Other state employees do not have the authority to respond on behalf of the Agency.

D. BACKGROUND INFORMATION

The Windmill Oil site is located in Sec 30, Township 18 South, Range 38 East, Hobbs, New Mexico. The Windmill Oil site is an area with extensive historical oil contamination of Ogallala formation ground water. Since the mid 1960's, approximately 100 wells were drilled into the ground water in the SE/4 of the NW/4, the S/2 of the NE/4, the NE/4 of the SE/4, and the NW/4 of the SE/4 of Section 30 by the Windmill Oil Company and several other individuals for the purposes of recovering fugitive oil from ground water for economic benefit. Originally, fugitive oil was produced from the top of the water table with windmills, and later by the use of submersible pumps. NMOCD records indicate that Windmill Oil Company produced approximately 425,000 barrels of oil from the ground water between 1965 and 1996. Approximately sixteen (16) feet of oil was measured on the water table in one former Windmill Oil Company well in June of 2000.

Since the 1960's a number of homes have been built in Section 30 within and north of area where oil is known to exist in the ground water. These homes are located outside of the area served by the City of Hobbs municipal water system. There are fifty-three (53) known private water wells that provide domestic water for these residences. These water wells are reported to be completed and draw ground water from the base of the Ogallala formation. There are a number of oil and gas production wells, oilfield flow lines and petroleum pipelines in the area. Depth to ground water at the site is estimated to be approximately 50-60 feet. The local ground water gradient is estimated to be toward the southeast. Investigation of the quality of ground water used for domestic purposes is necessary to determine potential impacts to public health.

II. TECHNICAL SPECIFICATIONS

The contractor shall:

1. Conduct a door to door water well survey of residences and businesses in Section 29 and Section 30, Township 18 South, Range 38 East that use wells for domestic water supplies or other purposes.

2. Purge and sample ground water from up to 80 water wells for concentrations of benzene, toluene, ethylbenzene, xylene (BTEX), polynuclear aromatic hydrocarbons (PAH), total dissolved solids (TDS), major cations/anions and New Mexico Water Quality Control Commission (WQCC) metals using EPA approved methods and quality assurance/quality control (QA/QC) procedures.

3. Provide GPS locations of any water wells which have not been previously identified.

4. Prepare and deliver to NMOCD a sampling report that contains:

   a. A description of the sampling activities which occurred.

   b. Any information on well depth, depth to water, age of well, well completion interval and use of wells obtained during the door to door survey.

   c. All purge volumes, field data and field observations obtained during each water well sampling event.

   d. A map showing the location of all water wells.

   e. Isopleth maps for contaminants observed during the investigation.

   f. Summary tables of all ground water quality sampling results and copies of all laboratory analytical data sheets and associated QA/QC data.

III. SCHEDULE

A. INITIATION OF WORK

The investigation shall be scheduled to commence as soon as possible after NMOCD approval of a contractor and purchase document for the investigation.

B. REPORT SUBMISSION

A report on the investigations shall be submitted to the NMOCD within 60 days of completion of the field sampling activities.

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
Jennifer A. Salisbury
Cabinet Secretary

Lori Wrotenbery
Director
Oil Conservation Division

MEMORANDUM

TO: Lori Wrotenbery, Director

FROM: William C. Olson, Hydrologist

THROUGH: Roger C. Anderson, Bureau Chief

DATE: May 23, 2001

RE: **WINDMILL OIL INVESTIGATIONS 2000-2001**

Below is a chronology and summary of the investigative actions that I have been involved with regarding ground water contamination of the Ogallala formation at the Windmill Oil site. Also included are some options for further investigation and remediation of ground water.

CHRONOLOGY YEAR 2000

January - Compile existing investigation and oil recovery information from Santa Fe and Hobbs District offices.

February - Inspect site and gauge product thickness in approximately 50 Windmill Oil Company and related company product recovery wells.

March - Meet with Lori Wrotenbery and Roger Anderson to identify the next steps the OCD can take to investigate contaminated ground water at the site including reviewing existing information in historical files and sampling of private water wells.

June - Inspect site and sample 16 private residential water wells around the boundary of the Windmill Oil site.

August - BLM informs the OCD that they have approximately $25,000 budgeted to look into ground water contamination at the site. Work with BLM to develop a scope of work for a contractor to review existing site information and write a preliminary assessment report.

September - Provide copies of June water well sample analyses and a written analysis of the water quality to landowners.

BLM issues contract for preparation of preliminary assessment report.

CHRONOLOGY YEAR 2001

February	-	Draft preliminary assessment report issued by contractor.
March	-	Meet with lawyers representing BP, Arco, Texaco, Amerada Hess, Marathon, Shell at their request to discuss how industry can assist the OCD at the site.
April	-	Final copy of preliminary assessment report issued.
May	-	Work with BLM to develop a scope of work for a contractor to produce a GIS map of the Windmill Oil site.

SUMMARY

Windmill Oil Company was started in the mid 1960's to recover and market oil produced from contaminated ground water within the Ogallala Formation in Section 30, Township 18 South, Range 38 East on the west side of Hobbs, New Mexico. Windmill Oil Company's recovery wells are in the vicinity of several oil production wells that were found to have casing leaks during an investigation by an OCC subcommittee in the 1950's. Unlined oil and gas disposal pits may also have been located in this area.

According to the preliminary assessment report approximately 425,000 barrels of oil have been recovered from the ground water within the Ogallala formation between 1965 and 1996. The OCD's site inspections and gauging of oil thickness on ground water have shown that there is currently no recovery of oil from the ground water by the Windmill Oil Company. This is because the water table elevation in the area has declined over time from pumping by fresh water wells such that the shallow recovery wells are virtually dry with no well screen intercepting either the floating oil or the ground water. However, over 15 feet of oil remains on the ground water in one area as shown by OCD measurements of one deep well on private property. The complete extent of free oil and dissolved phase contamination has never been determined.

Several blocks of residential housing are located within and north and east of the Windmill Oil Company operations. Private residents of the area on occasion have complained that they have detected hydrocarbon odors in their water and sometimes noticed a sheen on the water. The OCD water quality sampling of 16 private water wells did not reveal any oil-related contaminants in the water. However, 2 water wells were found to have total dissolved solids (TDS) concentrations slightly in excess of New Mexico Water Quality Control Commission (WQCC) standards and chloride concentrations which were elevated but below standards. In accordance with prior OCC subcommittee recommendations, it appears that private water wells in the area are screened at the base of the aquifer. Some of these wells may be producing water from underneath or adjacent to the hydrocarbon contaminated portion of the aquifer. In such cases these water wells could intermittently pull hydrocarbons into them during times of heavy pumping.

RECOMMENDATIONS

1. The OCD's prior sampling of residential water wells did not sample all water wells in the potentially affected area. Additional private well sampling needs to be conducted throughout the immediate vicinity of the Windmill Oil Company operations.

2. There is not any definitive information indicating whether or not there are ongoing sources of contamination at the site which continue to add oil-related contaminants to the ground water. A review needs to be conducted of existing and plugged oil and gas wells in the area to determine the integrity of the casing and plugs and stop any continuing sources of contamination.

3. An investigation of the extent of both the free phase oil and the dissolved phase portion of ground water contamination in the area needs to be conducted by installing ground water monitoring wells throughout the Windmill Oil area.

4. A recovery well needs to be installed and to recover oil from the ground water found during the OCD's sampling event.

5. Based upon the results of the investigations an overall plan needs to be developed for the remediation of both free oil and dissolved phase ground water contamination in excess of the standards.

GROUND WATER REGULATORY OPTIONS

1. Remediation Plan

A remediation plan could be required pursuant to OCD Rule 116.D. The plan would need to include a public participation process.

2. OCD Rule 19 Abatement Plan

The site could be investigated and remediated under an abatement plan. There are 2 options within Rule 19 which can be followed. Both options require a public participation process.

a. Voluntary Abatement - Pursuant to OCD Rule 19.E.(2) any person wishing to abate water pollution in excess of the standards may voluntarily submit an abatement plan to investigate and remediate water pollution. In March of 2001, several companies expressed an interest in assisting the OCD at this site. The OCD could approach these companies to see if they would be willing to voluntarily submit an abatement plan which would implement the above recommendations.

b. Mandatory Abatement - Several potentially responsible parties have been identified as operating oil and gas wells with casing leaks in the proximity of the Windmill Oil Company recovery wells. Due to the potential that these wells have contaminated ground water, the OCD could require an abatement plan of the operators pursuant to OCD Rule 19.C.(1) and E.(1).

3. Reclamation Fund

The OCD could issue a contract under the reclamation fund to drill boreholes and install ground water monitoring wells for the express purpose of definitively determining individual sources of ground water contamination. Upon completion of this work, the OCD could require an abatement plan from each responsible party or a collective group of parties pursuant to Rule 19, as discussed above, and cost recover the expenditures from the reclamation fund from the responsible parties.

4. Discharge Plan

If the remedial action involves a discharge to the surface or subsurface, the site could be investigated and remediated under a WQCC discharge plan. The discharge plan includes a process for public notification and involvement.

5. Investigation Agreement

The OCD could develop an agreement with the companies operating in the vicinity of the Windmill Oil Company to investigate potential contamination sources and the extent of contamination.

SUMMARIES OF GROUNDWATER CONTAMINATION CASES IN DISTRICT I

SUMMARY OF HOBBS AREA CONTAMINATION FILE

NATURE OF CONTAMINATION

Free phase crude oil began showing up in water wells in 1953. Areas of contamination are in the Southwest quarter of Township 18 South, Range 38 East, and Sections 4 and 5 of Township 19 South, Range 38 East.

INVESTIGATION

A committee was formed in June, 1957 to determine action needed to stop the contamination, and to contain the contamination. Sub-committees were appointed to identify sources of contamination, water well drilling and completion methods, and to determine all existing water well data in the area of interest. The committees were comprised of industry and government personnel. All casing integrities were checked in the Hobbs Pool.

CONCLUSIONS

The source of contamination was primarily attributed to oil and gas wells with leaking casing. Other sources identified were earthen pits used to dispose of waste fluids. Nothing was ever singled out as the sole problem.

REMEDIATION

Windmills continue to pump oil from the top of the Ogallala saturated zone to this day from S30-T18S-R38E.

THE New Mexico Environment Department

Review Facility Information

ID: 4622

Facility Name: Windmill Oil

help

Identification

Select a topic...

Guidance Documents

General

Select a topic...

Profile Tools

Select a topic...

Facility Profile

Facility Name:	Windmill Oil	**Start Date:**	08/19/2003
NMED Facility ID:	4622	**End Date:**	
Facility Type:	Contaminant Plume	**Field Office:**	Hobbs

Address Information

Physical Address	Mailing Address
T18S R38E S29,30	T18S R38E S29,30
Hobbs, NM 88240	Hobbs, NM 88240

Alternate/Historic Names

ID	Name	Type	Bureau-Program
AP	Windmill Oil	Contaminant Plume	GWQB-ROS-AP

Contact Information

Type	Address or Number

Related Facilities

Name	Type	Start Date	End Date

Related Organizations

Name	Type	Start Date	End Date

Related People

Name	Type	Start Date	End Date
Bart Faris	Is NMED's Ground Water Abatement Contact for	08/19/2003	

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NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
Jennifer A. Salisbury
Cabinet Secretary

Lori Wrotenbery
Director
Oil Conservation Division

MEMORANDUM

TO: Lori Wrotenbery, Director

FROM: William C. Olson, Hydrologist

THROUGH: Roger C. Anderson, Bureau Chief

DATE: May 23, 2001

RE: **WINDMILL OIL INVESTIGATIONS 2000-2001**

Below is a chronology and summary of the investigative actions that I have been involved with regarding ground water contamination of the Ogallala formation at the Windmill Oil site. Also included are some options for further investigation and remediation of ground water.

CHRONOLOGY YEAR 2000

January - Compile existing investigation and oil recovery information from Santa Fe and Hobbs District offices.

February - Inspect site and gauge product thickness in approximately 50 Windmill Oil Company and related company product recovery wells.

March - Meet with Lori Wrotenbery and Roger Anderson to identify the next steps the OCD can take to investigate contaminated ground water at the site including reviewing existing information in historical files and sampling of private water wells.

June - Inspect site and sample 16 private residential water wells around the boundary of the Windmill Oil site.

August - BLM informs the OCD that they have approximately $25,000 budgeted to look into ground water contamination at the site. Work with BLM to develop a scope of work for a contractor to review existing site information and write a preliminary assessment report.

September - Provide copies of June water well sample analyses and a written analysis of the water quality to landowners.

BLM issues contract for preparation of preliminary assessment report.

CHRONOLOGY YEAR 2001

February	-	Draft preliminary assessment report issued by contractor.
March	-	Meet with lawyers representing BP, Arco, Texaco, Amerada Hess, Marathon, Shell at their request to discuss how industry can assist the OCD at the site.
April	-	Final copy of preliminary assessment report issued.
May	-	Work with BLM to develop a scope of work for a contractor to produce a GIS map of the Windmill Oil site.

SUMMARY

Windmill Oil Company was started in the mid 1960's to recover and market oil produced from contaminated ground water within the Ogallala Formation in Section 30, Township 18 South, Range 38 East on the west side of Hobbs, New Mexico. Windmill Oil Company's recovery wells are in the vicinity of several oil production wells that were found to have casing leaks during an investigation by an OCC subcommittee in the 1950's. Unlined oil and gas disposal pits may also have been located in this area.

According to the preliminary assessment report approximately 425,000 barrels of oil have been recovered from the ground water within the Ogallala formation between 1965 and 1996. The OCD's site inspections and gauging of oil thickness on ground water have shown that there is currently no recovery of oil from the ground water by the Windmill Oil Company. This is because the water table elevation in the area has declined over time from pumping by fresh water wells such that the shallow recovery wells are virtually dry with no well screen intercepting either the floating oil or the ground water. However, over 15 feet of oil remains on the ground water in one area as shown by OCD measurements of one deep well on private property. The complete extent of free oil and dissolved phase contamination has never been determined.

Several blocks of residential housing are located within and north and east of the Windmill Oil Company operations. Private residents of the area on occasion have complained that they have detected hydrocarbon odors in their water and sometimes noticed a sheen on the water. The OCD water quality sampling of 16 private water wells did not reveal any oil-related contaminants in the water. However, 2 water wells were found to have total dissolved solids (TDS) concentrations slightly in excess of New Mexico Water Quality Control Commission (WQCC) standards and chloride concentrations which were elevated but below standards. In accordance with prior OCC subcommittee recommendations, it appears that private water wells in the area are screened at the base of the aquifer. Some of these wells may be producing water from underneath or adjacent to the hydrocarbon contaminated portion of the aquifer. In such cases these water wells could intermittently pull hydrocarbons into them during times of heavy pumping.

RECOMMENDATIONS

1. The OCD's prior sampling of residential water wells did not sample all water wells in the potentially affected area. Additional private well sampling needs to be conducted throughout the immediate vicinity of the Windmill Oil Company operations.

2. There is not any definitive information indicating whether or not there are ongoing sources of contamination at the site which continue to add oil-related contaminants to the ground water. A review needs to be conducted of existing and plugged oil and gas wells in the area to determine the integrity of the casing and plugs and stop any continuing sources of contamination.

3. An investigation of the extent of both the free phase oil and the dissolved phase portion of ground water contamination in the area needs to be conducted by installing ground water monitoring wells throughout the Windmill Oil area.

4. A recovery well needs to be installed and to recover oil from the ground water found during the OCD's sampling event.

5. Based upon the results of the investigations an overall plan needs to be developed for the remediation of both free oil and dissolved phase ground water contamination in excess of the standards.

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b. Mandatory Abatement - Several potentially responsible parties have been identified as operating oil and gas wells with casing leaks in the proximity of the Windmill Oil Company recovery wells. Due to the potential that these wells have contaminated ground water, the OCD could require an abatement plan of the operators pursuant to OCD Rule 19.C.(1) and E.(1).

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5. Investigation Agreement

The OCD could develop an agreement with the companies operating in the vicinity of the Windmill Oil Company to investigate potential contamination sources and the extent of contamination.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 3235
Order No. R-2902

APPLICATION OF JOSEPH O. WALTON
TO REMOVE AND MARKET OIL FROM THE
OGALALLA FORMATION, LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on April 14, 1965, at Hobbs, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 4th day of May, 1965, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Joseph O. Walton, seeks authority to remove and market oil from the Ogalalla formation in Section 30, Township 18 South, Range 38 East, NMPM, Lea County, New Mexico, without restriction concerning the method of operation or quantity of oil recovered.

(3) That the applicant proposes to recover crude oil from existing water wells completed in the Ogalalla formation and water wells to be drilled and completed in the Ogalalla formation in said Section 30.

(4) That the Ogalalla formation in said area contains fresh water supplies designated by the State Engineer and that

the presence of crude oil in said formation may constitute a hazard to said water supplies.

(5) That the Commission lacks jurisdiction to determine who has the right to recover said crude oil or the title to said crude oil but should authorize the recovery and marketing of said crude oil in order to prevent waste and protect fresh water supplies designated by the State Engineer.

IT IS THEREFORE ORDERED:

(1) That crude oil may be recovered from existing water wells completed in the Ogalalla formation and water wells to be drilled and completed in the Ogalalla formation in Section 30, Township 18 South, Range 38 East, NMPM, Lea County, New Mexico.

(2) That said crude oil may be marketed provided Commission Form C-104 has been filed with the Commission's Hobbs District Office stating the name of the seller, the name of the transporter, the amount of oil to be sold, and the location of the water well from which the oil was recovered.

(3) That each person or persons recovering crude oil under the provisions of this order shall keep a daily record of the amount of oil recovered from each water well, and shall file a monthly report, in duplicate, with the Commission's Hobbs District Office stating the amount of oil recovered and the amount of oil sold from each water well during the month.

(4) That the Commission will not determine who has the right to recover said crude oil or the title to said crude oil.

(5) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Jack M Campbell
JACK M. CAMPBELL, Chairman

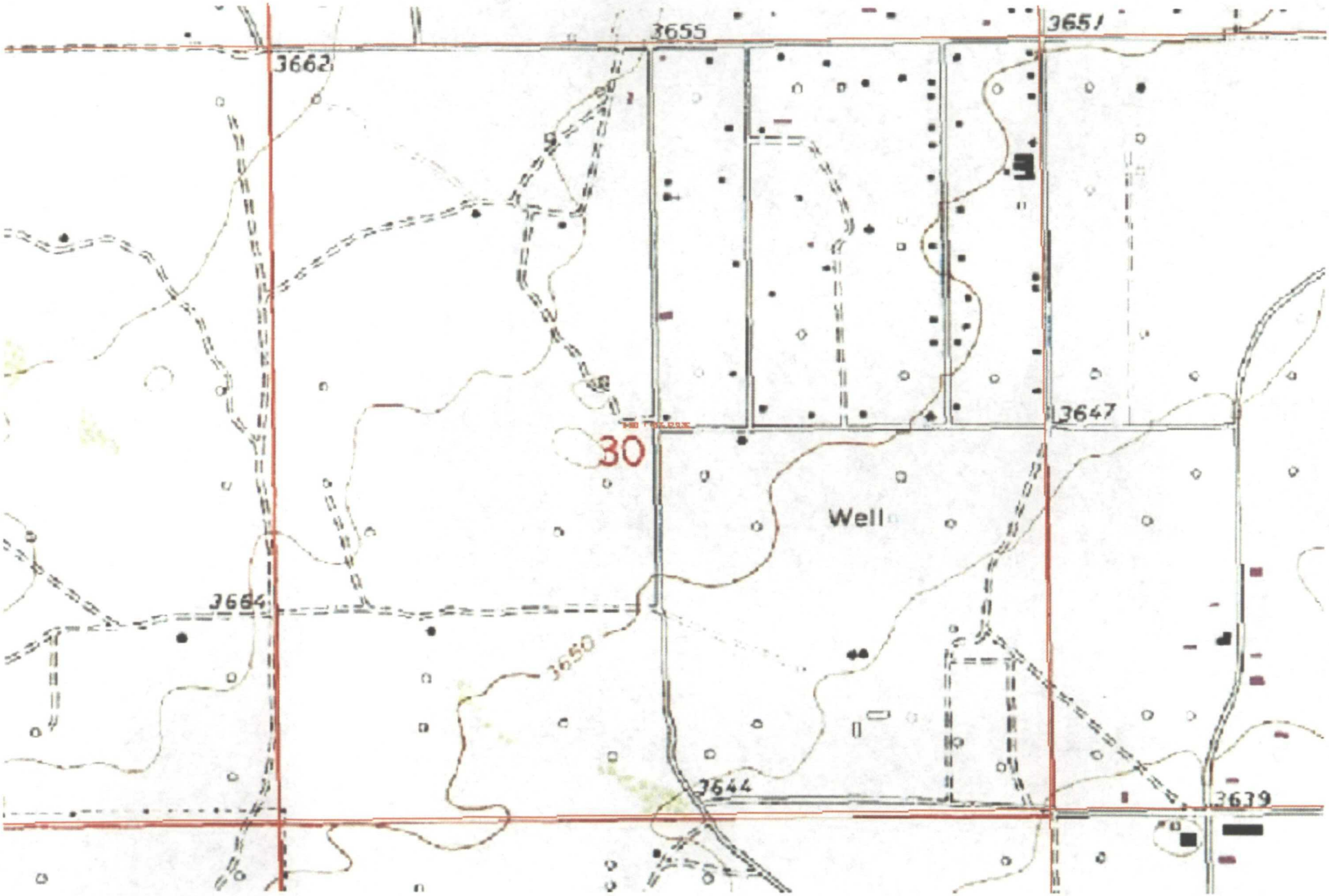
Guyton B. Hays
GUYTON B. HAYS, Member

A. L. PORTER, Jr., Member & Secretary

S E A L

esr/

Section 30, 18S, 38E - Windmill Oil Project, West of Hobbs



Oil Conservation Division

MapNotes

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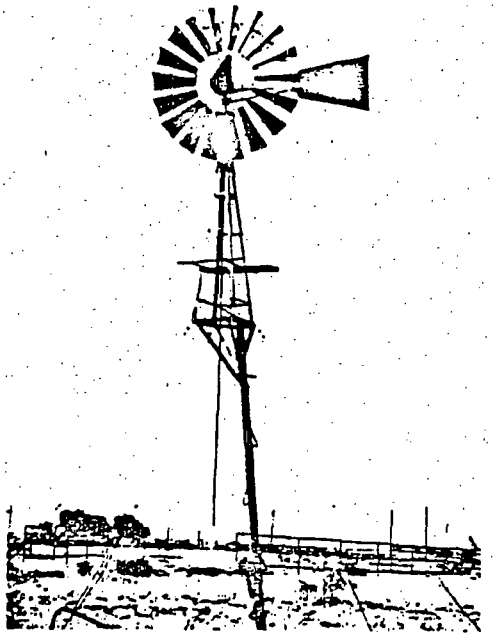
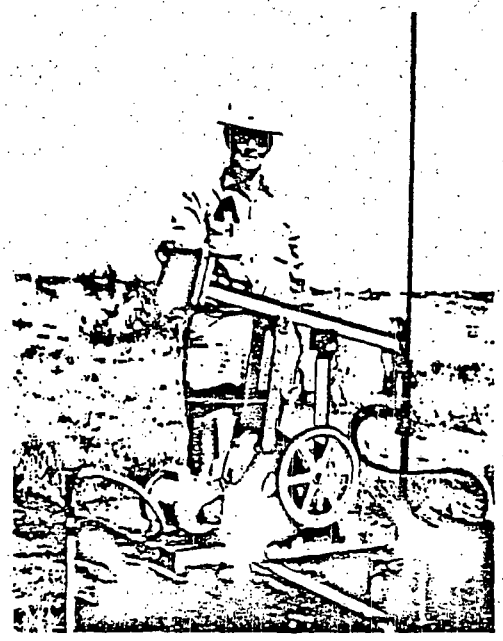
Glenn von Gonten





Windmills in the Oilfield

By Jolly Schram

"Use windmills to produce oil and gas?"

This question, accompanied by astonishment, is the quick reaction of a viewer of the windmill derricks, found 2 miles west of Hobbs, New Mexico, atop the old Hobbs pool.

Small windmills and tiny pumpjacks are scattered over an area which now has fewer than a dozen wells which for a decade have skimmed crude oil from the top of fresh-water wells.

Oil, seeping into fresh-water formations from holes in casing of producing wells that existed in the old field, soon found its way into nearby water sands and even sands below the water sands.

Occurring after World War II, the seepage accumulated until area residents on the western outskirts of the oiltown found three to seven feet of oil riding the water in their wells.

Produced from wells drilled by companies from depths of 3,800 to 4,000 in the San Andres and Bowers pay, the oil caused concern to those wanting the water, although several, too, readily knew the cash value of the crude oil.

A solution appeared in April of 1965, tells Joe Ramey, then district manager of the New Mexico Oil Conservation Commission and now secretary-director of the OCC for the state.

"In April, a local attorney, Joseph Walton, appeared in this office and said, 'I have a tank of oil outside. I want to sell it'."

When told that the oil had been pumped from the top of water in water wells, Ramey asked, "Then it isn't your oil to sell, is it?"

Answered the lawyer, "Well, I've signed an agreement with a landowner to decontaminate the water in his well!"

Adding to the story is Walton's partner in the beginning venture, Pat Ballew of Seminole, Texas, who recalls, "Joe had gotten water rights from landowners who received ⅛th of the oil to be produced from the water in the wells."

This action had been taken after Walton's friends "who had lots northwest of Hobbs had drilled for water and, every time, found oil," Ballew said.

Cont.

CASE No. 3235 /~~HEA~~ ORDER No. R-2902

Called by Walton, Ballew, as an inventor presently holding 11 United States patents, 2 Japanese patents, and 3 Canadian ones—chiefly for oilfield equipment, designed a pump to be run by a windmill. "This was both for the economics and to produce the oil slowly as it seeped," explains Ballew, who joined Walton's venture as a partner.

Ballew's pump, informally called the "Pat Ballew Special", was displayed by the partners at a called hearing of the New Mexico Oil Conservation Commission which met to make a ruling on such oil production from the field.

At the hearing, Ballew recalls, which was attended by the Commission members and representatives of major oil companies producing in the area, the pump was displayed and Walton asked for permission to sell the oil or to step aside if the oil was claimed by one of the major companies.

Asked if any major representative stepped forth, Ballew exploded, "Good Lord, No! There had already previously been filed a $1 million dollar lawsuit over pollution of those water wells, so none of the companies producing in the field came forth to claim the oil."

Ramey also recalls that when he asked Walton about the possibility of being sued for the oil by the major companies, Walton said, "Fine. I hope the oil companies will sue me. I have 50 landowners who are prepared to sue them for contamination of their water wells!"

With no other claims to the oil, the Windmill Oil Company, as named by Walton and Ballew, was granted permission to sell the oil by the OCC, and a total of 34 wells were drilled by the partnership with 32 producers, enumerated Ballew.

After 1966 in which a report went to the OCC noting that 51,000 barrels of oil had been recovered by the Windmill Company, others decided to join the shallow hunt. Included in the effort were the major companies of Marathon and Humble (now Exxon) who set up a drilling pattern.

"Unfortunately," sums up Ramey, "they drilled dry holes to the water zone and ended up with water wells but no oil."

Although the Windmill Oil Company partnership, founded by a handshake, eventually dissolved, the company received from its field at the peak a production of 7,000 barrels of oil a month average, which had slacked off to an average of 6 to 7,000 barrels a month when Ballew sold his interest to Walton. Walton proceeded then to operate the company and the field.

Walton chose the pragmatic to operating a field as described by Ramey:

"Most of the wells were 45 feet deep with a fluid level of 30 feet. In pumping the wells, Mr. Walton would go — sometimes hourly — to each well, open the bleeder line, and produce the oil there. If there was nothing, he would physically raise his tubing by hand and perhaps kick a 2x4 out from under the tubing and lower the pump an inch and a half. Or, if it took two 2x4's, he would lower it until it was producing oil. If he was producing water, he would raise the pump and slip a 2x4 under it."

"What was important," recalls Ramey, "It worked!"

How much oil was recovered by the shallow production?

As of summer of this year, a total of 325,000 barrels of crude oil has been recovered from the field with the Windmill Oil Company receiving 285,000 barrels and other individuals accounting for 40,000 barrels of oil, tallies Ramey.

Of the seepage, it is thought that most of the oil was lost by a major oil company through several leaks in casing that evolved over a period of years.

Proof of the seepage came after a rain when Joe Ramey went out to the area around which the Windmill Oil Company was operating. "For approximately 100 yards encircling one major company well, gas was bubbling up through the standing rainwater. We checked the main well by shutting it and running bottom hole pressure. It was about 400 pounds below all other area wells" which indicates that at the rate of flow of that level, the seepage in the years had been considerable.

Many wells in the area have now been abandoned, and attorney Walton is deceased, with ownership of his Windmill Oil Company passing to others in Hobbs. Production, though, for its owners averages 900 barrels of crude oil a month.

Sums up Joe Ramey, whose tenure now approaches 16 years with the New Mexico Oil Conservation Commission, the use of windmills to produce oil in Lea County "was the most unusual episode" of his career. †††

Lea County

Introduction

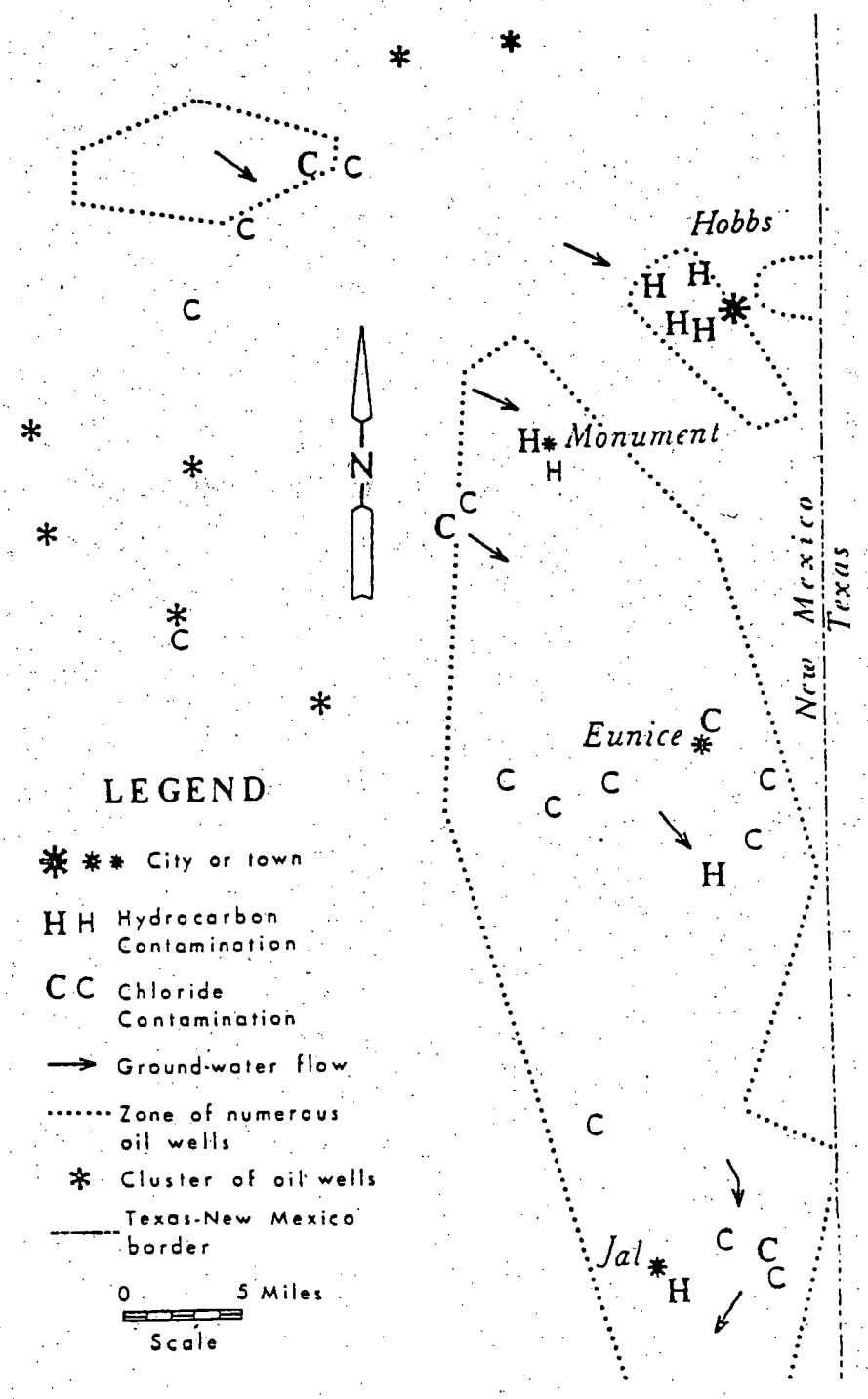
Lea County has been a major petroleum-production area for several decades. Large quantities of salt water are often produced with crude oils. Figure 2 shows zones of heavy salt-water production in southern Lea County. Collins (1975) discusses the geochemistry of oilfield waters in great detail. Hiss (1975) provides geochemical data specific to Lea County oilfield waters. Meyer (1966) provides geochemical data on produced water, crude petroleum and natural gas from certain reservoirs in Lea County.

Oil-field contamination of fresh ground-water resources "became evident" in the early 1950's (McGuinness, 1963). Numerous cases of known or suspected pollution of fresh-water aquifers by oil-field salt water are plotted on Figure 3. Chloride contamination cases are included because of the evidence (discussed below) that oil-field brines contain hydrocarbons of the benzene family and because most of the previous salt-water contamination studies have not included tests for aromatic hydrocarbons. Possible contamination mechanisms include surface-impoundment seepage and leakage from production-or injection-well casings. The disposal of large volumes of salt water into unlined pits was prohibited by the New Mexico Oil Conservation Commission (NMOCC) in March 1969.

Previous studies of ground-water contamination by oil-field salt waters have largely focused on parameters such as chloride and total dissolved solids. Organic contaminants were often neglected. In a 1973 EID investigation, phenols were also tested for and in at least one area (25S.37E.29.2), excessive levels of both chloride and phenols were detected (Sowers and others, 1973).

Figure 3. Known and Suspected Contamination of Ground-Water Resources by Oil-Field Activities in Southern Lea County, New Mexico.

The sizes of the community symbols are roughly proportional to their respective populations. Bold contamination symbols represent two or more cases in the same area. Some of the hydrocarbon contamination cases also involve chloride. The apparent directions of ground-water flow north of Eunice are from Ash (1963); those south of Eunice are from Nicholson and Clebsch (1961, Plate 2). The "zones of numerous oil wells" are taken from the topographic base map, Hobbs, New Mexico; Texas (U.S. Geological Survey map #NI 13-12 Series V 502).



Zarrella and others (1967) studied hydrocarbons (especially benzene) dissolved in subsurface brines including a specimen from the Bough oil field in northern Lea County. They found that water-soluble hydrocarbons partitioned between the oil and water phases. In several cases, including the Lea County site, they observed that benzene levels in formation waters decreased with increasing horizontal distance away from the production zone. They detected 10.7 ppm of benzene in brine co-produced with crude oil in the Bough field and 6.5 ppm of benzene in brine obtained two miles away from the production zone. They proposed that benzene concentrations in formation waters could be used as a petroleum-exploration method.

Meyer (1966) discusses the aromatic hydrocarbon contents of certain crude oils in Lea County. Two fields near Lovington, Kemnitz and Townsend, produce oils with relatively high contents of aromatic hydrocarbons.

Areas of concern about sewage contamination overlap with areas of concern about oilfield contamination in Hobbs. The respective ground-water quality impacts from each source are not well defined. Therefore, known and suspected sewage contamination, only in the Hobbs area, is included in the following inventory.

12S.36E.20,21,28 & 29 - Tatum Municipal Water-Supply Well #2

Hernandez (1958) reported that in the 1950s, well #2 had to be abandoned due to waste-oil contamination. The oil, originating from a filling station, was dumped into a shallow dug well for a number of years, thereby contaminating ground water.

13S.36E.33 and vicinity - McDonald Area

In response to complaints about tastes and odors of organic contaminants and pursuant to this contract, water from a private domestic well was sampled for purgeable aromatics on February 10, 1983. Ethylbenzene, isomers of xylene and heavier alkylbenzenes were detected at a total concentration of 26 ug/l. On April 6, 1983, the well was resampled, and another domestic well, located approximately one mile to the southwest, was also sampled. The first well sample again showed low ug/l levels of alkylbenzenes, while purgeable aromatics were not detected in the latter well sample.

18S.38E.30 and vicinity - West Hobbs Area

In 1928, oil was discovered in what would become known as the "Hobbs Pool." Oil-well casing leaks began to be discovered and repaired at least as early as 1934.

On August 12, 1953, an oil company notified NMOCC that casing leaks did exist. NMOCC met with Hobbs Pool operators on August 25, 1953 and directed that tests for casing leaks be conducted before October 1, 1953. A second directive was issued on March 12, 1954. In August 1956, NMOCC notified operators of the Hobbs Pool that ground-water contamination did exist in Section 30, and directed that oil-well casings in a four-section block surrounding the contaminated area be rechecked immediately and again in the near future. Between 1953 and 1957, a total of 52 wells in the Hobbs Pool area were found to have leaks and were repaired.

Measurements, of the vertical thicknesses of crude oil standing in water wells in this area in 1957, ranged from 0.5 to more than six feet. Several parties have recovered and sold the lost crude oil in quantities

large enough to draw the attention of the Oil Conservation Division (OCD) of the New Mexico Energy and Minerals Department. Based upon production reports submitted to OCD, the largest producer has removed more than 335,000 barrels (more than 14 million gallons) of crude oil from the Ogalalla water table from April 1965 to July 1983. See Appendix E for more historical details.

Several cases of contamination by natural gas were documented in the west Hobbs area in 1957 (Figure 4). The severity of contamination ranged from a "slight gas taste" to the observation of sporadic flames when a lit match was held near an open water faucet.

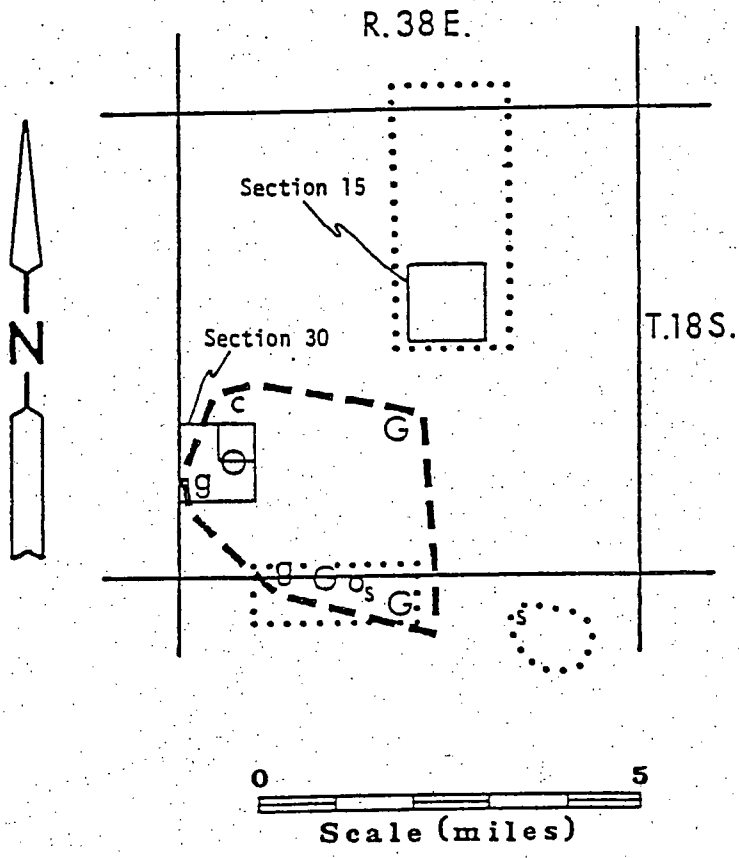
A 1977 to 1979 EID survey in the West Bender and Gibbs areas of West Hobbs found that many private domestic wells were polluted with coliform bacteria from the numerous private sewage-disposal systems (Figure 4). City water was recently provided to the Gibbs area.

18S.38E.3 & 15 and vicinity - North Hobbs Area

A 1983 EID survey found nitrate-N levels in excess of the 10 mg/l health standard in several private domestic wells in the north Hobbs area, located in the northern half of T18S, R38E (Figure 4). This area also contains numerous private sewage-disposal systems, some of which were built prior to 1973 when state regulations dealing with such systems (e.g., septic tanks) became effective. EID implemented a public-information program to warn the residents of this area about the potential health hazards of nitrate in domestic water.

Figure 4. Ground-Water Contamination in Hobbs, New Mexico and Vicinity.

The City of Hobbs is mostly within the southern half of T.18S. Upper-case symbols indicate two or more contaminated wells in the same area. Several wells in Section 15 (north Hobbs) produce water with nitrate greater than 10 mg/l as N. The northeast 1/4 of Section 30 (west Hobbs), where crude oil floats upon the water table, is also a sewage-concern area.



LEGEND

c	Chloride contamination
G g	Natural gas contamination
O o	Oil contamination
s	Sewage contamination
....	Area of concern about sewage contamination
— —	Area of concern about oil-field contamination
———	Township or Range boundary
———	Section or quarter Section boundary

19S.37E. 29 & 32 and 20S.37E. 4 & 5 - Monument Area

Nicholson and Clebsch (1961, p. 105) reported that in the mid to late 1950s, a well in 20S.37E.4.111 yielded water "with a decidedly strong taste and odor of hydrocarbons." The well owner reported that prior to September 1953, the well produced water suitable for all domestic purposes.

In the late 1970s, two domestic wells in the vicinity of 19S.37E.29.33 became contaminated. One well, the Durham stock well mentioned by Boyer and others (1980, p. 6-13), continues to produce an oily substance with water. The owners use another well for cattle water and continue to purge the bad well hoping that it will eventually clear up. The owners of the other domestic well, the Hull well mentioned by Jercinovic (1982, p. 4-8), reported that they continued to drink the obviously-contaminated water until two members of the family allegedly suffered diarrhea and stomach cramps (Carolyn Hull, personal communication, July 11, 1983).

McKinley County

13N.11W.17.1 and 18.2 - Abandoned Petroleum Refinery

"Gasoline" was found in two abandoned wells on the site of this abandoned petroleum refinery in 1961 (Cooper and John, 1968). A resident of the area began noticing tastes and odors of organic contaminants in water from his private domestic well at least as early as 1963. Deepening the well from 80 feet to 175 feet in 1963 caused the tastes and odors to disappear for only two to three years. In 1969 the owner began using a filter to make the water more palatable. In subsequent years, the owner switched twice to other commercial water filters.

WINDMILL OIL INVESTIGATION
(February 13, 2004)

A. PURPOSE

To investigate and remediate ground water contamination at the Windmill Oil site west of Hobbs, New Mexico.

B. BACKGROUND INFORMATION

The Windmill Oil site is located in Sec 30, Township 18 South, Range 38 East, Hobbs, New Mexico. The Windmill Oil site is an area with extensive historical oil contamination of Ogallala formation ground water. Since the mid 1960's, approximately 100 wells were drilled into the ground water in the SE/4 of the NW/4, the S/2 of the NE/4, the NE/4 of the SE/4, and the NW/4 of the SE/4 of Section 30 by the Windmill Oil Company and several other individuals for the purposes of recovering fugitive oil from ground water for economic benefit. Originally, fugitive oil was produced from the top of the water table with windmills, and later by the use of submersible pumps. NMOCD records indicate that Windmill Oil Company produced approximately 425,000 barrels of oil from the ground water between 1965 and 1996. Approximately sixteen (16) feet of oil was measured on the water table in one former Windmill Oil Company well in June of 2000.

Since the 1960's a number of homes have been built in Section 30 within and north of area where oil is known to exist in the ground water. These homes are located outside of the area served by the City of Hobbs municipal water system. There are fifty-three (53) known private water wells that provide domestic water for these residences. These water wells are reported to be completed and draw ground water from the base of the Ogallala formation. There are a number of oil and gas production wells, oilfield flow lines and petroleum pipelines in the area. Depth to ground water at the site is estimated to be approximately 50-60 feet. The local ground water gradient is estimated to be toward the southeast. Investigation and remediation of ground water is necessary to determine and mitigate potential impacts to public health.

C. PLAN OF ACTION

July 26, 2005: Glenn VonGonten will prepare a scope of work for further investigation at this site.

WINDMILL OIL INVESTIGATION
(February 13, 2004)

A. PURPOSE

To investigate and remediate ground water contamination at the Windmill Oil site west of Hobbs, New Mexico.

B. BACKGROUND INFORMATION

The Windmill Oil site is located in Sec 30, Township 18 South, Range 38 East, Hobbs, New Mexico. The Windmill Oil site is an area with extensive historical oil contamination of Ogallala formation ground water. Since the mid 1960's, approximately 100 wells were drilled into the ground water in the SE/4 of the NW/4, the S/2 of the NE/4, the NE/4 of the SE/4, and the NW/4 of the SE/4 of Section 30 by the Windmill Oil Company and several other individuals for the purposes of recovering fugitive oil from ground water for economic benefit. Originally, fugitive oil was produced from the top of the water table with windmills, and later by the use of submersible pumps. NMOCD records indicate that Windmill Oil Company produced approximately 425,000 barrels of oil from the ground water between 1965 and 1996. Approximately sixteen (16) feet of oil was measured on the water table in one former Windmill Oil Company well in June of 2000.

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March 31, 2003

Mr. Joseph J. Tracy
INTERA Inc.
One Park Square
6501 Americas Parkway NE, Suite 820
Albuquerque, New Mexico 87110

RE: OCD COVER LETTER FOR DOMESTIC WATER WELL SURVEY

Dear Mr. Tracy:

Enclosed are the signed copies of the New Mexico Oil Conversation Division (OCD) cover letter to be distributed with the water well survey for property owners in the Windmill Oil study area.

If you have any questions, please don't hesitate to call me at (505) 476-3491.

Sincerely,

William C. Olson
Hydrologist
Environmental Bureau

Enclosure

xc: Chris Williams, OCD Hobbs District Supervisor

<<<<<Date>>>>>

Name
Address
City, State <zip code>

RE: DOMESTIC WATER WELL SURVEY

Dear _____:

The State of New Mexico Oil Conservation Division (NMOCD) is initiating a study of ground water conditions in the vicinity of what has been called the Windmill Oil site. As part of this study, we are conducting a survey of water wells within section 29 and 30 of Township 18 South Range 38 East, Lea County, New Mexico. Where water wells are identified, the NMOCD is requesting permission to sample water from the wells and submit the samples for a laboratory analysis of the ground water quality. The NMOCD has contracted with INTERA, Inc. to conduct the survey and sample the water wells. All water sampling costs and laboratory sample analyses will be paid for by the NMOCD. A copy of the analyses and an explanation of the water quality in each well will be provided to the well owners.

You have been identified as owning property in this area. We request that you please complete the attached well survey form and return the survey form in either the self addressed stamped envelope or by fax as indicated on the form. If you have a water well, our contractor, INTERA, Inc., will be contacting you on behalf of the NMOCD to request a convenient time to schedule to sample your water well. Your cooperation in this survey is greatly appreciated and will help us better understand the ground water conditions in this area.

If you have any questions, please don't hesitate to call me at (505)476-3490 or Bill Olson of my staff at (505) 476-3491. Thank you for your cooperation.

Sincerely,

Roger C. Anderson
Environmental Bureau Chief

DOMESTIC WATER WELL SURVEY
WINDMILL OIL SITE

The information gathered in this survey is for the sole purpose of conducting a domestic well sampling program at the request of the New Mexico Oil Conservation Division. Your information will aid our field technicians in developing a schedule that will accommodate your availability. We would like to thank you for your aid and ask that you complete this survey in a timely manner and to the best of your knowledge. Please complete and return using the enclosed self addressed stamped envelope or fax to (505) 246-2600 Attn: Jerome A. Marez.

Property Owner(s) Name: _____

Address: _____

State: _____ Zip: _____

How many wells are located on the property? _____ How many wells are for domestic use? _____

Where is each domestic use well located on the Property? Please describe with as much detail as possible.

Well No. 1: _____

_____

Well No. 2: _____

_____

Well No. 3: _____

_____

Well No. 4: _____

_____

When was each domestic use well constructed (MM/DD/YY)?

Well No. 1 _____ Well No. 2 _____ Well No. 3 _____

Well No. 4 _____

What is each domestic use well approximate total depth and depth to water?

Well No. 1 _____ Well No. 2 _____

Well No. 3 _____ Well No. 4 _____

How can the well be accessed? Exterior access point (lawn spigot, at well, etc) or interior access point (kitchen faucet, bathroom sink, etc)

Well No. 1 _____ Well No. 2 _____ Well No. 3 _____

Well No. 4 _____

Please circle the following:

Day(s) and time(s) that would best for our technician to visit and take water samples?

DAY:						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
TIME:						
7:00 am	9:00 am	11:00 am	1:00 pm	3:00 pm	5:00 pm	7:00 pm

When would be the best time to call to arrange an appointment to test your well on the day(s) and time(s) specified above?

Person to Call _____

Telephone Daytime: _____ Evening: _____

Mobile Phone: _____

For the protection of our technicians, please list all animals located onsite or around the well location.

Animals Located Onsite (livestock, dogs, etc): _____

_____

Are any of the domestic use wells registered with State of New Mexico Engineer's office? Yes or No?

Additional comments or questions regarding this survey:

_____

_____

_____

_____

_____

_____

I hereby grant access to INTERA representatives, acting on behalf of the State of New Mexico Oil Conservation Division, to my property for the sole purpose of obtaining water samples for testing from my domestic supply well. I also verify that I (or a representative for me) will be available during the time(s) indicated above.

Name: _____

Signature: _____

SCOPE OF WORK

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

NEW MEXICO OIL CONSERVATION DIVISION

GROUND WATER CONTAMINATION INVESTIGATION

WINDMILL OIL SITE

FEBRUARY 10, 2003

I. INTRODUCTION

A. PURPOSE

The State of New Mexico Oil Conservation Division of the Energy, Minerals and Natural Resources Department (NMOCD) is conducting an investigation to determine potential impacts to public and private water wells from petroleum contaminated ground water at the Windmill Oil site on the western side of Hobbs, New Mexico.

B. SUMMARY SCOPE OF WORK

The contractor shall perform the work necessary to determine potential impacts to public and private water wells in the area adjacent to the Windmill Oil site. The scope of work includes, but is not limited to:

1. conducting a door to door survey of water wells in the area;
2. GPS locating of water well locations not previously identified;
3. sampling ground water from water wells
4. preparation of an investigation report.

C. PROCUREMENT MANAGER

NMOCD has designated a Procurement Manager who is responsible for the conduct of this procurement whose name, address and telephone number are listed below.

William C. Olson
New Mexico Oil Conservation Division
1220 Saint Francis
Santa Fe, New Mexico 87505
Phone: 505-476-3491
Fax: 505-476-3462
e-mail: wolson@state.nm.us

All deliveries via express carrier should be addressed as above. Any inquiries or requests regarding this procurement should be submitted to the Procurement Manager in writing. Other state employees do not have the authority to respond on behalf of the Agency.

D. BACKGROUND INFORMATION

The Windmill Oil site is located in Sec 30, Township 18 South, Range 38 East, Hobbs, New Mexico. The Windmill Oil site is an area with extensive historical oil contamination of Ogallala formation ground water. Since the mid 1960's, approximately 100 wells were drilled into the ground water in the SE/4 of the NW/4, the S/2 of the NE/4, the NE/4 of the SE/4, and the NW/4 of the SE/4 of Section 30 by the Windmill Oil Company and several other individuals for the purposes of recovering fugitive oil from ground water for economic benefit. Originally, fugitive oil was produced from the top of the water table with windmills, and later by the use of submersible pumps. NMOCD records indicate that Windmill Oil Company produced approximately 425,000 barrels of oil from the ground water between 1965 and 1996. Approximately sixteen (16) feet of oil was measured on the water table in one former Windmill Oil Company well in June of 2000.

Since the 1960's a number of homes have been built in Section 30 within and north of area where oil is known to exist in the ground water. These homes are located outside of the area served by the City of Hobbs municipal water system. There are fifty-three (53) known private water wells that provide domestic water for these residences. These water wells are reported to be completed and draw ground water from the base of the Ogallala formation. There are a number of oil and gas production wells, oilfield flow lines and petroleum pipelines in the area. Depth to ground water at the site is estimated to be approximately 50-60 feet. The local ground water gradient is estimated to be toward the southeast. Investigation of the quality of ground water used for domestic purposes is necessary to determine potential impacts to public health.

II. TECHNICAL SPECIFICATIONS

The contractor shall:

1. Conduct a door to door water well survey of residences and businesses in Section 29 and Section 30, Township 18 South, Range 38 East that use wells for domestic water supplies or other purposes.

2. Purge and sample ground water from up to 80 water wells for concentrations of benzene, toluene, ethylbenzene, xylene (BTEX), polynuclear aromatic hydrocarbons (PAH), total dissolved solids (TDS), major cations/anions and New Mexico Water Quality Control Commission (WQCC) metals using EPA approved methods and quality assurance/quality control (QA/QC) procedures.

3. Provide GPS locations of any water wells which have not been previously identified.

4. Prepare and deliver to NMOCD a sampling report that contains:

   a. A description of the sampling activities which occurred.

   b. Any information on well depth, depth to water, age of well, well completion interval and use of wells obtained during the door to door survey.

   c. All purge volumes, field data and field observations obtained during each water well sampling event.

   d. A map showing the location of all water wells.

   e. Isopleth maps for contaminants observed during the investigation.

   f. Summary tables of all ground water quality sampling results and copies of all laboratory analytical data sheets and associated QA/QC data.

III. SCHEDULE

A. INITIATION OF WORK

The investigation shall be scheduled to commence as soon as possible after NMOCD approval of a contractor and purchase document for the investigation.

B. REPORT SUBMISSION

A report on the investigations shall be submitted to the NMOCD within 60 days of completion of the field sampling activities.

MEMORANDUM

TO: Lori Wrotenbery, Director

FROM: William C. Olson, Hydrologist

THROUGH: Roger C. Anderson, Bureau Chief

DATE: May 23, 2001

RE: **WINDMILL OIL INVESTIGATIONS 2000-2001**

Below is a chronology and summary of the investigative actions that I have been involved with regarding ground water contamination of the Ogallala formation at the Windmill Oil site. Also included are some options for further investigation and remediation of ground water.

CHRONOLOGY YEAR 2000

January - Compile existing investigation and oil recovery information from Santa Fe and Hobbs District offices.

February - Inspect site and gauge product thickness in approximately 50 Windmill Oil Company and related company product recovery wells.

March - Meet with Lori Wrotenbery and Roger Anderson to identify the next steps the OCD can take to investigate contaminated ground water at the site including reviewing existing information in historical files and sampling of private water wells.

June - Inspect site and sample 16 private residential water wells around the boundary of the Windmill Oil site.

August - BLM informs the OCD that they have approximately $25,000 budgeted to look into ground water contamination at the site. Work with BLM to develop a scope of work for a contractor to review existing site information and write a preliminary assessment report.

September - Provide copies of June water well sample analyses and a written analysis of the water quality to landowners.

BLM issues contract for preparation of preliminary assessment report.

CHRONOLOGY YEAR 2001

February	-	Draft preliminary assessment report issued by contractor.
March	-	Meet with lawyers representing BP, Arco, Texaco, Amerada Hess, Marathon, Shell at their request to discuss how industry can assist the OCD at the site.
April	-	Final copy of preliminary assessment report issued.
May	-	Work with BLM to develop a scope of work for a contractor to produce a GIS map of the Windmill Oil site.

SUMMARY

Windmill Oil Company was started in the mid 1960's to recover and market oil produced from contaminated ground water within the Ogallala Formation in Section 30, Township 18 South, Range 38 East on the west side of Hobbs, New Mexico. Windmill Oil Company's recovery wells are in the vicinity of several oil production wells that were found to have casing leaks during an investigation by an OCC subcommittee in the 1950's. Unlined oil and gas disposal pits may also have been located in this area.

According to the preliminary assessment report approximately 425,000 barrels of oil have been recovered from the ground water within the Ogallala formation between 1965 and 1996. The OCD's site inspections and gauging of oil thickness on ground water have shown that there is currently no recovery of oil from the ground water by the Windmill Oil Company. This is because the water table elevation in the area has declined over time from pumping by fresh water wells such that the shallow recovery wells are virtually dry with no well screen intercepting either the floating oil or the ground water. However, over 15 feet of oil remains on the ground water in one area as shown by OCD measurements of one deep well on private property. The complete extent of free oil and dissolved phase contamination has never been determined.

Several blocks of residential housing are located within and north and east of the Windmill Oil Company operations. Private residents of the area on occasion have complained that they have detected hydrocarbon odors in their water and sometimes noticed a sheen on the water. The OCD water quality sampling of 16 private water wells did not reveal any oil-related contaminants in the water. However, 2 water wells were found to have total dissolved solids (TDS) concentrations slightly in excess of New Mexico Water Quality Control Commission (WQCC) standards and chloride concentrations which were elevated but below standards. In accordance with prior OCC subcommittee recommendations, it appears that private water wells in the area are screened at the base of the aquifer. Some of these wells may be producing water from underneath or adjacent to the hydrocarbon contaminated portion of the aquifer. In such cases these water wells could intermittently pull hydrocarbons into them during times of heavy pumping.

RECOMMENDATIONS

1. The OCD's prior sampling of residential water wells did not sample all water wells in the potentially affected area. Additional private well sampling needs to be conducted throughout the immediate vicinity of the Windmill Oil Company operations.

2. There is not any definitive information indicating whether or not there are ongoing sources of contamination at the site which continue to add oil-related contaminants to the ground water. A review needs to be conducted of existing and plugged oil and gas wells in the area to determine the integrity of the casing and plugs and stop any continuing sources of contamination.

3. An investigation of the extent of both the free phase oil and the dissolved phase portion of ground water contamination in the area needs to be conducted by installing ground water monitoring wells throughout the Windmill Oil area.

4. A recovery well needs to be installed and to recover oil from the ground water found during the OCD's sampling event.

5. Based upon the results of the investigations an overall plan needs to be developed for the remediation of both free oil and dissolved phase ground water contamination in excess of the standards.

GROUND WATER REGULATORY OPTIONS

1. Remediation Plan

A remediation plan could be required pursuant to OCD Rule 116.D. The plan would need to include a public participation process.

2. OCD Rule 19 Abatement Plan

The site could be investigated and remediated under an abatement plan. There are 2 options within Rule 19 which can be followed. Both options require a public participation process.

a. Voluntary Abatement - Pursuant to OCD Rule 19.E.(2) any person wishing to abate water pollution in excess of the standards may voluntarily submit an abatement plan to investigate and remediate water pollution. In March of 2001, several companies expressed an interest in assisting the OCD at this site. The OCD could approach these companies to see if they would be willing to voluntarily submit an abatement plan which would implement the above recommendations.

b. Mandatory Abatement - Several potentially responsible parties have been identified as operating oil and gas wells with casing leaks in the proximity of the Windmill Oil Company recovery wells. Due to the potential that these wells have contaminated ground water, the OCD could require an abatement plan of the operators pursuant to OCD Rule 19.C.(1) and E.(1).

3. Reclamation Fund

The OCD could issue a contract under the reclamation fund to drill boreholes and install ground water monitoring wells for the express purpose of definitively determining individual sources of ground water contamination. Upon completion of this work, the OCD could require an abatement plan from each responsible party or a collective group of parties pursuant to Rule 19, as discussed above, and cost recover the expenditures from the reclamation fund from the responsible parties.

4. Discharge Plan

If the remedial action involves a discharge to the surface or subsurface, the site could be investigated and remediated under a WQCC discharge plan. The discharge plan includes a process for public notification and involvement.

5. Investigation Agreement

The OCD could develop an agreement with the companies operating in the vicinity of the Windmill Oil Company to investigate potential contamination sources and the extent of contamination.

Task Order for the Windmill Oil Field

The contractor is to produce a map covering approximately 3 square miles surrounding the Windmill Oil field. The objective of this map is to document the locations of skimmer oil wells previously operated by the Windmill Oil Company and any additional oil production wells in the study area. Additional information that would provide geographic referencing should also be added to the map. This would include such features such as surface administration, primary roads, and secondary roads used for accessing well heads, and buildings or structures. A digital rastor graphic (DRG), USGS 7.5 "quadrangle map" georeferenced to the earth.

The contractor is to provide their own GPS equipment that provides differential correction allowing for approximately 1 meter accuracy. The map format is to be provided in ARCView 3.x. The deliverable is to be provided as a hard copy to the local BLM office (Hobbs) and compact disk (CD) containing all GPS files and GIS data files.

Olson, William
From: Billy_Lacewell@nm.blm.gov [SMTP:Billy_Lacewell@nm.blm.gov]
Sent: Thursday, May 03, 2001 10:57 AM
To: wolson@state.nm.us
Subject: Re: Mapping Ogallalla

Let me know by cob today if your have suggestions for improvement. Thx, Link ----- Forwarded by Billy Lacewell/CFO/NM/BLM/DOI on 05/03/01 11:08 AM -----

Brent Lewis

To: Billy Lacewell/CFO/NM/BLM/DOI@BLM
05/03/01 09: 41 cc:
AM Subject: Re: Mapping Ogallalla(Document link: Billy Lacewell)

Attached is a draft task order. We may need to add travel and estimated

WindmillGPS.wpd

time. Feel free to make changes.(See attached file: WindmillGPS.wpd)

Olson, William

From: Billy_Lacewell@nm.blm.gov [SMTP:Billy_Lacewell@nm.blm.gov]
Sent: Wednesday, August 16, 2000 4:14 PM
To: Olson, William
Subject: Ogallala west of Hobbs

Hi Bill, attached is draft task order which would mobilize a hazmat company to do preliminary investigation into the Ogallala/Windmill situation. I have asked our BLM contract administrator if language could be included for public outreach/ involvement.

(See attached file: Ogallala TO.wpd)

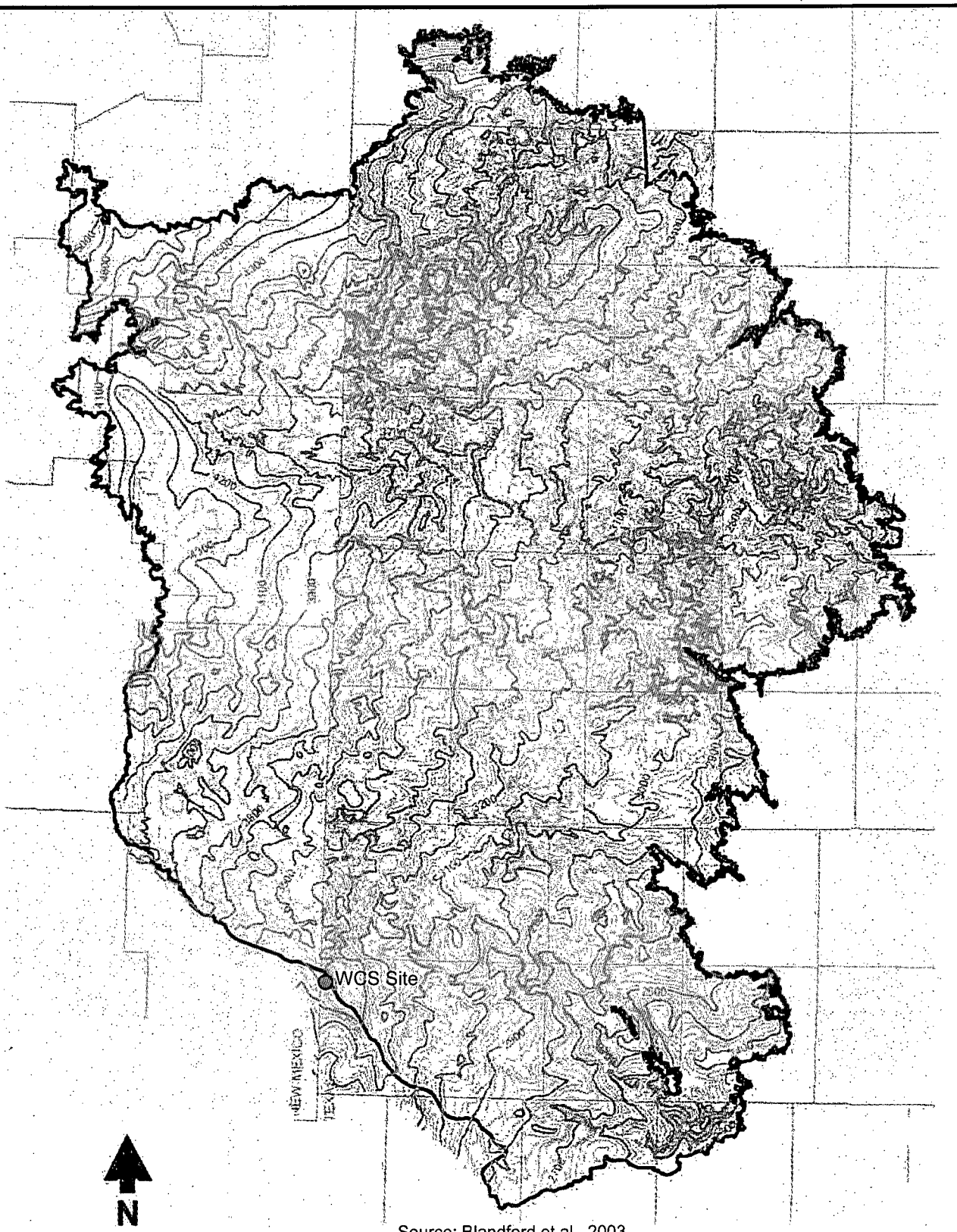
Loosely speaking, I would say the long term objectives of this effort is determine if there is release, determine source and extent of release, all in collaboration with affected interests, with responsible party eventually fixing problem if possible. The first part of the effort is assemble existing information and get the players identified and invited, especially since other entities have equal or more ownership in this than BLM. This is still being thought through at BLM State Office to firm up an approach, but as I said we have some money budgeted to start this year.

My phone is 234-5904, address is BLM, 620 E Greene, Carlsbad NM 88220, e-mail

is Billy_Lacewell @blm.gov

Ogallala TO.wpd

Ideas thoughts welcome. Thanks, Link Lacewell



Source: Blandford et al., 2003

Date: 02/06/04
File: WCS_Fig6.2-7.fh11

INTERA INCORPORATED
9111A Research Blvd.
Austin, TX 78758

COOK-JOYCE INC.
ENGINEERING AND CONSULTING
812 WEST ELEVENTH
AUSTIN, TEXAS 78701-2000
(512) 474-9087 FAX (512) 474-9483

Structure Contour Map of the Base of the Ogallala Formation

Figure 6.2-7

The production of oil from the Ogallalla aquifer has been occurring since the settlement of a lawsuit between Humble and J. Walton in 1966. As a result of this lawsuit, Humble gave farmouts to several small operators to recover this oil. Copies of some of the relevant documents regarding this Ogallalla oil are listed below and attached in Data Volume B of this Report.

OGALLALLA

Source	Date	Description
OCC	9/24/57	Final Report for Protection of Hobbs Fresh Water Sands
OCC	5/4/65	Authorization for J Walton to remove oil from the Ogallalla through a water well. No determination is made as who has the right to recover or the title to the oil
USGS	9/3/65	Memo noting the history of the Humble-Walton disagreements. Noted that on either 6/14/65 of 6/15/65 that Humble notified Permian Corp that all of the Ogallalla was theirs. Law suits have been filed to settle the ownership matter.
Humble	6/16/66	Farmout Agreement between Humble and Windmill is a result of lawsuit settlement.
BLM	8/4/66	Notice of Farmout Agreement between Humble and Walton (Windmill Oil Co) regarding the production of oil from the Ogallalla. Humble will maintain its bond. It is HBP.
Humble	8/12/66	Request for OCC Hearing regarding their farmout to Windmill to produce Ogallalla oil.
BLM	9/15/66	Memo regarding Humble's request for OCC Hearing regarding farmout with Windmill to produce Ogallalla oil.
USGS	10/5/66	Memo regarding fact that it was Walton's opinion that, as a result of the settlement between Humble and Windmill Oil Co, Humble would be paying the BLM their royalties prior to June, 1966, that have been held in escrow by Permian.
Walton	10/19/66	Royalty will be paid on posted price less buyer's transportation costs.
BLM w/ Humble's cover	5/19/67	Humble's "Designation of Operator" to Jomar Industries for their farmout of Humble's production of oil on the Ogallalla in the Bowers "A" Federal Lease
BLM	4/10/70	Transfer of heirs of J Walton to continue to produce oil from the Ogallalla through the Humble Farmout
Windmill Agent	7/7/70	Location of 23 Ogallalla water wells that Windmill is operating.
BLM	5/21/86	Designation of Operator (Shirey & Steinberg) by Humble
OCD	1/23/97	Letter stating OCD will not assign API Numbers to the Ogallalla wells.
OCD	7/1/97	Letter stating that the OCD will take no action against Exxon for Plugging and abandoning the shallow wells in the Ogallalla on the Bowers "A" Federal Lease.

WINDMILL INVENTORY

◇ DATA (PRESENT + HISTORICAL)
- ANALYTICAL DATA (dt)
- MAPS
- CROSS-SECTIONS
- WATER WELLS
- STRIPPER WELLS
- PRODUCTION WELLS
- PIPELINES
- TANKS

◇ REPORTS (HISTORICAL)

◇ INDUSTRY WORK GROUP
↳ BBE MAPS
JERRY SMITH EXXON GLOBAL REMEDIATION
713-656-9185
OXY, BP, EXXON, AHR, MARATHON, TEXACO

◦ OCC ~~ORDERS~~ HEARINGS + ORDERS
- 9/24/1957 - FINAL REPORT OF THE COMMITTEE

◦ BLM ACTIONS

◇ CONTRACT ADMIN (HISTORICAL)

◇ 2005 CONTRACT
- PHASE IIa - INV + PRESUMPTIVE REMEDIATION
- PHASE IIb - CONSORTIUM OF PRPs TO PROVIDE DRINKING WATER + ALL PARTIES.

2002 | ⊡ DYNAMAC CORP (BLM STUDY)

↳ Final Site Maps

NEED ↳ (CD) w/ GPS + GIS data Files (ARCVIEW 3.X FMT)

CONTACT @ LINK LACEWELL (BLM) @ CARLSBAD FIELD OFFICE

DYNAMAC CORP. – BRYAN FREY (240) 778-1012

NEED CD + E-COPY OF PRELIMINARY ASSMT

+ FINAL REPORT ?

• 2/23/2001 – Preliminary Assessment of the Windmill Oil Site

FOR: BLM

BY: DYNAMAC CORP.

8/1/01 8/19 ✗ BLM CONTACT: (LINK) LACEWELL @ CARLSBAD

505 234 5904

8/18/2005 @ 4:10. left msg. rtn @ 4:32 PM

need CD + E-copy – will check @ 8/19/2005

last correspondence @ 2002 w/ Dynamac

2003 BBC INTERNATIONAL

BEHALF OF ~~WINDMILL~~ OIL GROUP

- 11/16/2003 – DATA CD + MAPS
  - ↳ DATA CD : WINDMILL OIL – SECTION 30 – RESEARCH DATA (REV)
  - ↳ W/ ACCESS DB
  - MAPS
    - ↳ OIL WELL LOCATION MAP
    - ↳ WINDMILL OIL WELL LOCATION MAP
    - ↳ DOMESTIC WATER WELL LOCATION MAP
    - ↳ RIGHT-OF-WAY PIPELINE EASEMENTS MAP
    - ↳ HOBBS CITY WATER WELL LOCATION MAP.

NEED DWG. FILES

HAVE

↳ NB: FIGS HAVE SURFACE ELEV., BUT NOT @ DB

↳ check w/ MA : WINDMILL OIL GROUP

2003 INTERRA

NEED COPY

- 7/9/2003 - Final Investigation Report for the NMOCD, Windmill Oil Site, Hobbs, NM
  - ↳ JEROME MANEZ / STACY SASOL
    505-246-1600

- 2/14/2003 - SOW

TASK 1): PROJECT COORD

2): WW SURVEY + SAMPLE SCHEDULING

3): FIELD INV: GPS + WW SAMPLES

4): INV. REPORT

1965 OCC Hearing

Case No. 3235, R-2902

- GW FLOW MODEL
- CONTAMINANT MODEL
- PLOTTER
- ARCVIEW / ETC.
- GEOPHYSICS (CONDUCTIVITY)?
- NO GEOPROBE BECAUSE OF CALICHE
- MWS + CORES
- SVE, AIR PHASE, SKIMMER WELLS