1R - 424

GENERAL CORRESPONDENCE

YEAR(S):

2003 - 2005

Price, Wayne, EMNRD

From: Price, Wayne, EMNRD
Sent: Friday, September 29, 2006 3:45 PM
To: Carolyn Haynes; Kristin Pope
Subject: Meeting OCT 11

Please include Redwood Tank M-5 1R0424 in our discussions.

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

January 25, 2005

Mr. Wayne Price
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: M-5 Redwood Tanks, Section 5 T20S R37E Unit M
NMOCD Case #NOT YET ASSIGNED

Dear Wayne:

In your E-mail of November 18, 2004, you wrote:

1. Collect soil samples 3 feet below the bottom of where the two tanks sit. Soil samples shall be analyzed for BTEX, TPH and Chlorides.

2. Provide documentation from the landowner that burying the asphaltic material is permissible. If landowner agrees, then perform a SPLP 1312 on this material.

3. Notify this office and the local OCD office when sampling occurs.

With respect to items 1 and 3, ROC routinely collects samples such as you requested prior to closure of sites. In the future, we will specifically reference this standard closure protocol our corrective action plan. We will notify the local NMOCD office 72 hours before ROC obtains the samples. Please examine Figure 1, which is a southwestern looking view of the depression caused by removal of the redwood tanks. We have attached the original file of this digital image to this submission to permit close examination. The green hardware (well control valve) and 165-gallon white tank are associated with the active salt water disposal well that will remain on-site. In the bottom of the depression are the two circular concrete bases of the former tanks. Cleaning and inspection of these concrete bases shows no discoloration of the concrete due to intrusion of produced water and hydrocarbons and no fractures or other conduits that would allow seepage to the subsurface through the concrete. The attached image labeled

"hole 1" provides a close-up of the concrete pad. We do not propose to compromise the integrity of these concrete pads to obtain samples directly below the tanks. These images suggest that seepage from the tanks occurred through the redwood or where the redwood met the concrete. We will sample in the areas of obvious seepage at or near the edges of the concrete slab.

Figure 1 does show discolored soil to the left (east) of the active disposal well and a stockpile of discolored soil on the west side of the well. Our Corrective Action Plan presents data from two boreholes located in the area of the stockpile shown in Figure 1. Samples from these borings (SB-3 and SB-4) detected high total petroleum hydrocarbon values but low BTEX concentrations. Below we reproduce a portion of the soil analytical results from our Corrective Action Plan.

Well_ID	Date	GRO_C6_C12	DRO_>C12_C35	TOTAL_C6_C35	Chloride	Benzene	Toluene	Ethylbenzene	p/mXylene	oXylene
		Results in mg/kg				Results in ug/kg				
M5 SB4 4'	11/5/2003	1740	11300	13040		74.1	<25	476	1560	65.9
M5 SB4 2'	11/5/2003	203	2210	2413	88.6	<25	<25	1090	228	25.3
M5 SB4 6'	11/5/2003	133	593	726		<25	<25	325	<25	<25
M5 SB4 7'	11/5/2003	56.6	161	218	35.4	<25	<25	143	38	<25

We placed our hand-auger boring (B-4) about 3 feet from the edge of the tank; the arrow in Figure 1 is the location of this boring. Boring B-4 was located essentially at the edge of the depression shown in Figure 1. To provide additional characterization of the residual hydrocarbon material, as requested by NMOCD, we plan the following:

1. Obtain 2 representative samples from the side of the depression where the tanks once stood at the location of SB-4 to confirm the initial results presented in our Corrective Action Plan.
2. Hand auger below the concrete pad at this same location to a depth of 9 and 11 feet below the original grade (about 2 and 4 feet below the concrete pad) and obtain samples for TPH and BTEX.
3. Obtain 2 samples using the protocol outlined in 1 (for a sample above the pad) and 2 (for a sample below the pad) above at the location east of the active disposal well where Figure 1 shows some discoloration of soil.
4. Repeat the protocol at a third location selected to characterize the residual soil near the eastern-most tank pad.
5. Obtain one sample of the surface asphaltic material that comprised the berms around the former storage tanks.
6. We will ask the laboratory to analyze these nine (9) samples for TPH and BTEX using the following methods:
   (i) bvBenzene, toluene, ethylbenzene and xylene
      - EPA Method 8021
   (ii) Total Petroleum Hydrocarbons
      - EPA Method Modified 8015
   (iii) Chloride
      - EPA Method 300

7. As a matter of academic interest and to respond to NMOCD's second request, we will ask the laboratory to use the SPLP method (BTEX) for the two samples that exhibit the highest TPH concentration.

Some states employ the SPLP analytical method to evaluate Risk Based Corrective Action initiatives at specific sites. As directed by the NMOCD, we will comply with your request and employ this method as outlined in item 7 of our proposed scope of work. To what shall we compare these results? In New Mexico, a protocol for evaluating a risk-based corrective action for residual hydrocarbons in soil does exist within the UST Guidance manual; however the UST Manual does not employ the SPLP method.

If the analyses confirm the results presented in the Corrective Action Plan, we will anticipate NMOCD approval of the plan and we will move forward as proposed.

With respect to NMOCD request #2, we need clarification regarding the regulatory authority for this request in order to gain approval for this action by the System Partners. We clearly understand NMOCD's mandate under the Oil and Gas Act is protection of fresh water, public health and the environment. If NMOCD agrees that our plan provides such protection and approves this Corrective Action Plan, we will notify the landowner as is our custom. If any landowner objects to any Corrective Action Plan that is consistent with Regulations or Rules, we will discuss the plan with the landowner and negotiate a business solution that remains consistent with Rules and is consistent with our lease. Perhaps these negotiations will cause us to submit a modification to the approved plan. However, in the absence of an NMOCD-approved Corrective Action Plan, we have nothing to present to the landowner.

ROC would like to resolve this matter to permit backfilling of the depression shown in Figure 1.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall Hicks
Principal

Price, Wayne

From: Price, Wayne
Sent: Thursday, December 09, 2004 10:42 AM
To: Carolyn Doran Haynes (E-mail); Kristin Farris Pope (E-mail)
Cc: Randall Hicks (E-mail); Gil Van Deventer (E-mail)
Subject: Path Forward

Dear Ms. Haynes:

The OCD has logged every ROC site into our RBDM system. I will be sending you this comprehensive list. The list will have case numbers for all of our sites. I would like to see Kristin add those numbers to here spreadsheet if possible. I will be in the process of reviewing all of the closure sites (i.e. green sheet cover) and hope to send you approvals so we can close those sites out. I would also think it would be helpful if ROC would spell out on your spread sheet how each site was being closed. For example if one of the generic plans is or was used please note that, If not then signify type of closure, i.e. case-by-case, etc.

For disclosure sites, I am going to try to let ROC set the priority for these sites, however if we receive a complaint or in OCD's opinion it is a possible threat to public health then we may ask you to address that particular site.

I have already sent you my comments concerning the monument area up-gradient groundwater issue. The vadose zone and groundwater issues will have to be addressed. One thing we might do is set a lower priority on those sites and delay work until we have more data.

The other issue of concern for OCD is where disclosure sites had groundwater contamination and over a period of time this contamination has been reduced below the groundwater standards by dilution. OCD is very concerned that salt density gradient plumes are simply moving off site and thus could degrade down-gradient fresh water sources. OCD has a fiduciary duty to make sure this is not happing. Therefore, ROC will be expected to demonstrate this phenomenon is not happing. OCD will not accept models that demonstrate this unless monitor wells are installed to calibrate the model.

Sincerely:

Wayne Price
New Mexico Oil Conservation Division
1220 S. Saint Francis Drive
Santa Fe, NM 87505
505-476-3487
fax: 505-476-3462
E-mail: WPRICE@state.nm.us

Price, Wayne

From: Price, Wayne
Sent: Monday, December 06, 2004 4:23 PM
To: Carolyn Doran Haynes (E-mail)
Cc: Kristin Farris Pope (E-mail); Anderson, Roger; Fesmire, Mark
Subject: Rice Operating Company Contaminated Sites located in the Monument NM area

Dear Ms. Haynes:

The OCD is hereby responding to you concerning the issue of Rice Operating Company's contaminated sites where there is existing up-gradient groundwater contamination. OCD's position will be that such sites where the vadose zone is contaminated, and may potentially add to the existing groundwater contamination, such sites shall be addressed with an appropriate approved remediation plan. Therefore, please submit plans for these sites or notify OCD if these sites will be cleaned-up pursuant to one of the Generic Plans previously approved.

Sincerely:

Wayne Price
New Mexico Oil Conservation Division
1220 S. Saint Francis Drive
Santa Fe, NM 87505
505-476-3487
fax: 505-476-3462
E-mail: WPRICE@state.nm.us

Price, Wayne

From: Price, Wayne
Sent: Thursday, November 18, 2004 11:07 AM
To: Carolyn Doran Haynes (E-mail); Kristin Farris Pope (E-mail)
Cc: Sheeley, Paul; Johnson, Larry
Subject: M-5 Redwood Tank Project Sec 5-T20s-R37E

Dear Ms Haynes and Pope:

OCD is in receipt of the M-5 Corrective Action Plan dated September 10, 2004. After reviewing the document the OCD has the following comments and requirements:

1. Collect soil samples 3 feet below the bottom of where the two tanks sit. Soil samples shall be analyzed for BTEX, TPH and Chlorides.

2. Provide documentation from the landowner that burying the asphaltic material is permissible. If landowner agrees, then perform a SPLP 1312 on this material.

3. Notify this office and the local OCD office when sampling occurs.

Sincerely:

Wayne Price
New Mexico Oil Conservation Division
1220 S. Saint Francis Drive
Santa Fe, NM 87505
505-476-3487
fax: 505-476-3462
E-mail: WPRICE@state.nm.us

Price, Wayne

From: Price, Wayne
Sent: Friday, October 01, 2004 4:46 PM
To: Carolyn Doran Haynes (E-mail); Randall Hicks (E-mail)
Cc: Sheeley, Paul; Johnson, Larry
Subject: Rice M-5 Redwood Tanks

In order for OCD to continue its evaluation of this site please provide the following information:

1. Who is the landowner?
2. Your report indicates that natural conditions for chloride are between 209 and 479 ppm. Are you talking about soil or water?
3. The sites located on plate 5 (EME) who do they belong to?

Sincerely:

Wayne Price
New Mexico Oil Conservation Division
1220 S. Saint Francis Drive
Santa Fe, NM 87505
505-476-3487
fax: 505-476-3462
E-mail: WPRICE@state.nm.us

RICE Operating Company
122 West Taylor • Hobbs, New Mexico 88240
Phone: (505)393-9174 • Fax: (505) 397-1471

CERTIFIED MAIL
RETURN RECEIPT NO. 7002 2410 0000 4940 1206

December 30, 2003

Mr. Roger Anderson
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505

RE: NOTIFICATION OF GROUNDWATER IMPACT
EUNICE MONUMENT EUMONT (EME) SWD SYSTEM
M-5 BELOW-GRADE REDWOOD TANK FACILITY
Unit M, Sec. 5, T20S, R37E, Lea County, New Mexico

Mr. Anderson:

Rice Operating Company (ROC) takes this opportunity to notify the Director of the NMOCD, Environmental Bureau of groundwater impact in accordance with NM Rule 116. The following table lists the water chemistry of the qualifying site. The remediation of this site may fall under NM Rule 19 procedures.

Groundwater Impact (mg/L)

SYSTEM	SITE NAME	UNIT	SEC	T	R	SAMPLE DATE	TDS	Chloride	Benzene	Toluene	Ethyl Benzene	Total Xylenes
EME	M-5 SWD	M	5	20S	37E	12/11/03	11736	6198	<0.002	<0.002	<0.002	<0.006

Groundwater was encountered during the drilling of a monitoring well as part of the NMOCD-approved RBCA work plan for the redwood tank facility prescribed by R.T. Hicks Consultants. Depth to water is approximately 33 ft. Prior to drilling, ROC provided the NMOCD with an information package regarding this site that included a C-103 form, site map, photos, a copy of

the work plan and approval, and a copy of the lease. NMOCD has not assigned ROC a case number for this site.

ROC is the service provider (operator) for the EME Salt Water Disposal System and has no ownership of any portion of the pipelines, wells, or facilities. The EME System is owned by a consortium of oil producers, System Partners, who provide all operating capital on a percentage ownership/usage basis. Environmental remediation projects of this magnitude may require System Partner AFE approval and work begins as funds are received.

Please accept this notification for the EME M-5 Redwood Tank Facility.

RICE OPERATING COMPANY

Kristin Farris

Kristin Farris
Project Scientist

Enclosed: NMOCD approval

Cc: LBG, CDH, SC, file

Mr. Chris Williams
NMOCD, District 1 Office
1625 N. French Drive
Hobbs, NM 88240

Price, Wayne

From: Randall Hicks [R@rthicksconsult.com]
Sent: Wednesday, November 03, 2004 4:01 PM
To: 'Price, Wayne'
Cc: Kristin Farris Pope
Subject: M-5

Wayne

The answer to your questions regarding this site.

Randy Hicks
505-266-5004 - office
505-238-9515 - cell

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

November 3, 2004

Mr. Wayne Price
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: M-5 Redwood Tanks- Response to NMOCD Comments

Dear Mr. Price

On October 1, 2003 you transmitted an email communication which included these questions:

1. Who is the landowner? [of the M-5 site]
2. Your report indicates that natural conditions for chloride are between 209 and 479 ppm. Are you talking about soil or water?
3. The sites located on plate 5 (EME) who do they belong to?

Rice Operating Company leases the land that includes the active injection well and the former Redwood Tanks from the Barber Estate. This estate includes James Dellis Barber, Mary V. Barber, Jimmie T. Cooper, Broadman Ware, Browning Ware, Connie Ware, and Weston Ware.

All of the chloride measurements referenced in your email communication are soils data. We believe the background chloride in soil is slightly higher than other places in Lea County due to this site's proximity to the former Climax Chemical facility. Windblown salt from the various exposed piles at this site is probably distributed downwind (east). Precipitation will drive the windblown salt into the upper vadose zone. We have seen this same phenomenon of slightly elevated background chloride in soil in Eddy County near the Potash Mines.

With respect to the EME system sites identified on Plate 5, the land ownership is:

M-5 SWD	Barber Estate
P-6 Leak	Chevron Texaco
Jct. K-6	U.S. Government, BLM
Jct. M-16-1	State of New Mexico, SLO
Jct. E-5	Barber Estate
Jct. N-5	Barber Estate
M-9 SWD	S&W Cattle Co. (Trent Stradley)
Jct. N-4-1	Elsie Reeves

If you have any additional questions or comments regarding our proposed closure of this site, please contact Kristin Pope of Rice Operating Company with a copy to my office.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy:
Rice Operating Company

RICE *Operating Company*

122 West Taylor • Hobbs, New Mexico 88240
Phone: (505)393-9174 • Fax: (505) 397-1471

October 29, 2003

Mr. Chris Williams
New Mexico Energy, Minerals, & Natural Resources Department
Oil Conservation Division, Environmental Bureau
1625 N. French Drive
Hobbs, New Mexico 88240

RE: REDWOOD TANK REPLACEMENT/CLOSURE PLAN FOR EME SWD M-5
Unit letter M, Sec. 5, T20S, R37E
Lea County, New Mexico

Mr. Williams:

Rice Operating Company (ROC) takes this opportunity to notify the NMOCD of work to be performed at the below-grade redwood tanks at the EME Salt Water Disposal Well M-5, located in Unit Letter M, Section 4, T20S, R37E, Lea County, New Mexico. This facility is located on fee land owned by the James Barber Estate in the care of Jimmy Cooper.

ROC is the service provider (operator) for the EME Salt Water Disposal System and has no ownership of any portion of pipeline, well, or facility. The EME System is owned by a consortium of oil producers, System Partners, who provide all operating capital on a percentage ownership/usage basis. Replacement/closure projects of this magnitude require System Partner AFE approval and work begins as funds are received.

The Project AFE for the SWD M-5 Facility has been approved by the System Partners and work will commence on November 3, 2003 with delineation drilling and the installation of monitor wells at the site of the redwood tanks. Work will be conducted according to the NMOCD-approved Risk-Based Corrective Action (RBCA) plan prescribed by R.T. Hicks Consultants of Albuquerque which will employ the HYDRUS1D model to evaluate the potential of any impact in the vadose zone to impair groundwater quality at this site. Wayne Price of the NMOCD has approved this RBCA plan.

The below-grade redwood tanks will be replaced with aboveground, fiberglass tanks set within a poly liner as secondary containment. The redwood tanks will be cleaned, dismantled, and removed. The tank materials will be properly disposed of at an approved oilfield waste facility and documentation will be included in the Final Closure Report.

The enclosed C-103 form further addresses the work to be performed at this site. ROC will schedule all major events with a 48-hour advance notice to the NMOCD. The Final Closure Report and Subsequent C-103 will follow at the end of this project.

Thank you for your consideration of this project.

RICE OPERATING COMPANY

Kristin Farris

Kristin Farris
Project Scientist

Enclosures: work plan, C-103, site map, photos, lease agreement, one-call, pit inventory form

Cc: LBG, CDH, RTH, file

Wayne Price
NMOCD
1220 S. St. Francis Dr.
Santa Fe, NM 87504

Submit 3 Copies To Appropriate District Office
District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Ave., Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised June 10, 2003

WELL API NO. 30-025-12801

5. Indicate Type of Lease STATE ☐ FEE ☒

6. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name
EUNICE MONUMENT EUMONT (EME)

1. Type of Well:
Oil Well ☐ Gas Well ☐ Other SWD WELL

8. Well Number
M-5

2. Name of Operator
RICE OPERATING COMPANY

9. OGRID Number

3. Address of Operator
122 W. TAYLOR, HOBBS, NM 88240

10. Pool name or Wildcat
SAN ANDRES

4. Well Location

Unit Letter M : 100 feet from the SOUTH line and 250 feet from the WEST line

Section 5 Township 20S Range 37E NMPM LEA County

11. Elevation *(Show whether DR, RKB, RT, GR, etc.)*
3525' GL; 3537 KB

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	PLUG AND ABANDONMENT	☐
PULL OR ALTER CASING	☐	MULTIPLE COMPLETION	☐	CASING TEST AND CEMENT JOB	☐		
OTHER:		CLOSE REDWOOD TANKS	☒	OTHER:			☐

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

Proposed work according to NMOCD-approved RBCA workplan submitted by R. T. Hicks Consultants of Albuquerque: Delineate vertical and lateral extent of impact by drilling and obtaining samples from the boreholes and converting the boreholes to monitor wells as necessary. The HYDRUS1D model will be employed to evaluate the potential of any impact in the vadose zone to impair groundwater quality at this site. A remedy will be devised based on these results. Drilling will be conducted on November 3, 2003. Replacement tanks will be erected 300 ft west of the current redwood tanks. All major events including boring and sampling will be coordinated to allow 48 hours notice to NMOCD.

Depth to groundwater is 33 ft.
The NMOCD Site Assessment Score for M-5 = 20.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Kristin Farris TITLE Project Scientist DATE 10-28-03

Type or print name Kristin Farris E-mail address: enviro@leaco.net Telephone No. (505) 393-9174

(This space for State use)

APPPROVED BY _____ TITLE _____ DATE _____

Conditions of approval, if any:

Price, Wayne

From: Randall Hicks [R@rthicksconsult.com]
Sent: Thursday, October 02, 2003 5:58 AM
To: 'Price, Wayne'
Cc: enviro@leaco.net; Carolyn Doran Haynes
Subject: M-5 Tanks

Wayne

Remember that I was going to send you one more workplan for Rice? This is it.

If you can spend a few minutes looking at it then, hopefully approving it, that would be fantastic. We need to get the final AFE for this site approved by the Partners before we proceed. We are trying to coordinate a single field program to do the work at all of these four sites:

Zachary Hinton
B-29
N-29, and
M-5

Please note that my office has a new address and fax number. Same phone number.

Come down to Hobbs and see what we are doing – at least it will not be the July heat.

Randy

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

October 2, 2003

Mr. Wayne Price
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: M-5 Redwood Tanks, Section 5 T20S R37E Unit M

Dear Mr. Price

Rice Operating Company retained Hicks Consultants to address potential environmental concerns at the above referenced site. This submission proposes a scope of work that we believe will best mitigate any threat to human health and the environment and lead to closure of the regulatory file for this site.

Background

The M-5 Redwood Tank Site is located about 2 miles southwest of Monument, New Mexico. Figure 1 shows the location of the site. Mr. Jimmy Cooper is the owner of the land surface at this location. Rice Operating Company (ROC) is the service provider (operator) for the Eunice-Monument-Eumount (EME) Saltwater Disposal System and has no ownership of any portion of pipeline, well, or facility. The EME System is owned by a consortium of oil producers, System Partners, who provide all operating capital on a percentage ownership/usage basis. Major projects require System Partner authorization of expenditures (AFE) approval and work begins as funds are received. We will implement the work outlined herein after NMOCD approval and subsequent authorization from the System Partners.

1. Evaluate Possible Impacts to Soil and Ground Water

The M-5 Redwood Tanks have operated for several decades and will be replaced with tanks that meet more current industry standards. ROC has replaced several such tanks in the past and found that some of these sites caused impairment of ground water quality or have the potential to cause such impairment. The first task of this work assignment is determining the magnitude and extent of any such impairment.

The HYDRUS1D and mixing model simulation, which we plan to employ in Task 2, requires input of 10 parameters. As Table 1 shows, we must collect site specific data for several of these parameters. First we will measure the depth to ground water at nearby windmills and monitoring wells to determine the hydraulic gradient. Figure 1 shows the location of four windmills which we hope to employ in this initial water level

measurement program. We know that several monitoring wells are nearby, such as the ROC well at the P-6 site, west of the tanks. We will employ this well and others to clearly establish the hydraulic gradient of the area and the direction of ground water flow.

Table 1: Input Parameters for Simulation Modeling

Input Parameter	Source
Vadose Zone Thickness	Proposed monitoring well and borings
Vadose Zone Texture	Proposed monitoring well and borings
Dispersion Length	Professional judgment
Soil Moisture	Field Measurements from borings
Vadose Zone Chloride Load	Proposed borings adjacent to the tanks
Length of release perpendicular to ground water flow	Field Measurements
Climate	Pearl, NM station (Hobbs)
Background Chloride in Ground Water	Samples from nearby water supply wells and monitoring wells
Ground Water Flux	Calculated from regional hydraulic data and data from nearby wells
Aquifer Thickness	Nicholson and Clebsch (1960) and SEO data and proposed monitoring well

Because ROC plans to move forward with taking these two tanks out of service and constructing new facilities adjacent to the existing tanks, our work is independent of this replacement program. We plan to collect samples from four boreholes adjacent to the tanks to obtain information for other input parameters.

Near the northwest side of the tanks (up gradient of probable ground water flow), we will install a boring as close as practical to the existing tanks, perhaps between the two tanks. Drilling and sampling will cease in this borehole when we encounter ground water (approximately 30 feet below grade). We propose a second boring 15 feet west of the westernmost tank and a third boring 30 feet east of the easternmost tank. Again, drilling and sampling will cease in these boreholes when we encounter ground water. Sixty feet southeast of the tanks, we plan a fourth boring which we will convert to a monitoring well as described later.

From each boring, we will obtain split-spoon soil samples every five feet of the vadose zone. We will evaluate these discrete samples, the borehole drilling characteristics, and drill cuttings to develop a lithologic profile of the vadose zone. We will employ standard methods, as described in the Junction Box Replacement Program Plan, to evaluate all soil samples in the field for chloride content, TPH and volatile organic

constituent content. We will submit at least one soil sample from each boring to a qualified laboratory for evaluation of chloride and BTEXN (benzene, toluene, ethylbenzene, xylene, naphthalene). The field geologist will identify samples for laboratory analysis after review of the field analysis of chloride, TPH and VOCs. The geologist will select two samples from the first boring and two samples from the fourth boring for laboratory analysis of soil moisture content and bulk density.

After we complete the sampling program described above for the fourth boring, will continue drilling through the saturated zone to the top of the Dockam Group red beds, which form the base of the aquifer in this area. If the saturated thickness of the aquifer in this boring is less than 25 feet, we will install a 2-inch monitoring well with five feet of screen above the water table and 15 feet below the water table, in a manner consistent with industry standards (see NMOCD, ASTM or EPA publications). If the saturated thickness of the aquifer is greater than 25 feet we will install two 2-inch wells in the same boring. We will complete the uppermost well as described above. In the deeper well, we will install 5 feet of well screen above the top of the Dockam Group red beds. If possible, we will isolate the two screened intervals by installing bentonite pellets above the lowermost screened interval.

To establish background chloride concentrations in ground water, we propose to sample Water Wells #1 and #2 on Figure 1. We also plan to employ water analysis from a proposed background monitoring well (MW-3) at the ROC P-6 Line Leak Site (work plan submitted by Trident Environmental).

2. Evaluate Chloride, Benzene and Naphthalene Flux from the Vadose Zone to Ground Water

We propose to employ HYDRUS1D and a simple ground water mixing model to evaluate the potential of any residual chloride and hydrocarbon mass in the vadose zone to materially impair ground water quality at the site. We will employ predictions of the migration of chloride ion, benzene and naphthalene from the vadose zone to ground water in our selection of an appropriate remedy for the land surface and underlying vadose zone. This simulation is the "no action" alternative which predicts chloride flux to ground water in the absence of any action by ROC. We have selected these three constituents for simulation modeling because each of these constituents exists in the fluids stored in the tanks and each is specifically regulated by New Mexico ground water regulations (WQCC).

We might provide simulations of two "no action" scenarios. For both simulations, we will employ the input parameters to HYDRUS and the mixing model outlined in Table 1. In the first simulation, we will assume that vegetation is not present over the release site (no evapotranspiration) and a minimum aquifer thickness of 10 feet. This will simulate restriction of any released chloride and hydrocarbons to a portion of the underlying aquifer. If this first simulation does not return results that are consistent with the ground water data from the proposed monitoring well (see below), we will increase the aquifer thickness in the mixing model to the total thickness measured in nearby water

supply wells or from the proposed monitoring well. At other sites, we have found that chloride can be distributed throughout the thickness of the aquifer. Employing the entire thickness of the aquifer in the mixing model calculations for chloride may be appropriate for M-5 tank site. Data may show that employing the entire aquifer thickness in the mixing model for hydrocarbons may not be appropriate.

3. Design Remedy and Submit Report

After ROC completes the replacement of the tanks, we anticipate no additional releases of produced water. Our modeling of the "no action alternative" (Task 1) may show that the residual chloride and hydrocarbon mass in the vadose zone poses a threat to ground water quality. If such a threat does exist, we will use the HYDRUS-1D model predictions to develop a remedy for the vadose zone. If necessary, we will simulate:

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2. installation of a low permeability barrier to minimize natural infiltration,

3. surface grading to eliminate any ponding of precipitation thereby minimizing natural infiltration, and

4. a combination of the above potential remedies.

We will select the vadose zone remedy that offers the greatest environmental benefit while causing the least environmental damage. We may elect to export the affected soil to a disposal site and import clean soil, or we may treat the soil on site then re-fill the excavation with the restored soil.

We will use the ground water mixing model or a suitable alternative to assist in the design of a ground water remedy. It is possible, however, that the background chloride and /or hydrocarbon concentrations in ground water measured in the nearby windmills are equal to or higher than the concentration in the proposed monitoring well. Such data would strongly suggest that the M-5 tank site has not caused any material impairment of ground water quality. If we find no evidence of impairment of water quality due to past activities, we will not prepare a ground water remedy. If data suggest that the site has contributed chloride or hydrocarbons to ground water and caused ground water impairment, we will examine the following alternatives:

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4. Because of the location of the site, institutional controls negotiated with the landowner may provide an effective remedy. Such controls may be restriction of water use to livestock until natural restoration returns the water quality to state standards, a provision for alternative supply well design, or a provision for well head treatment to mitigate any damage to the water resource.

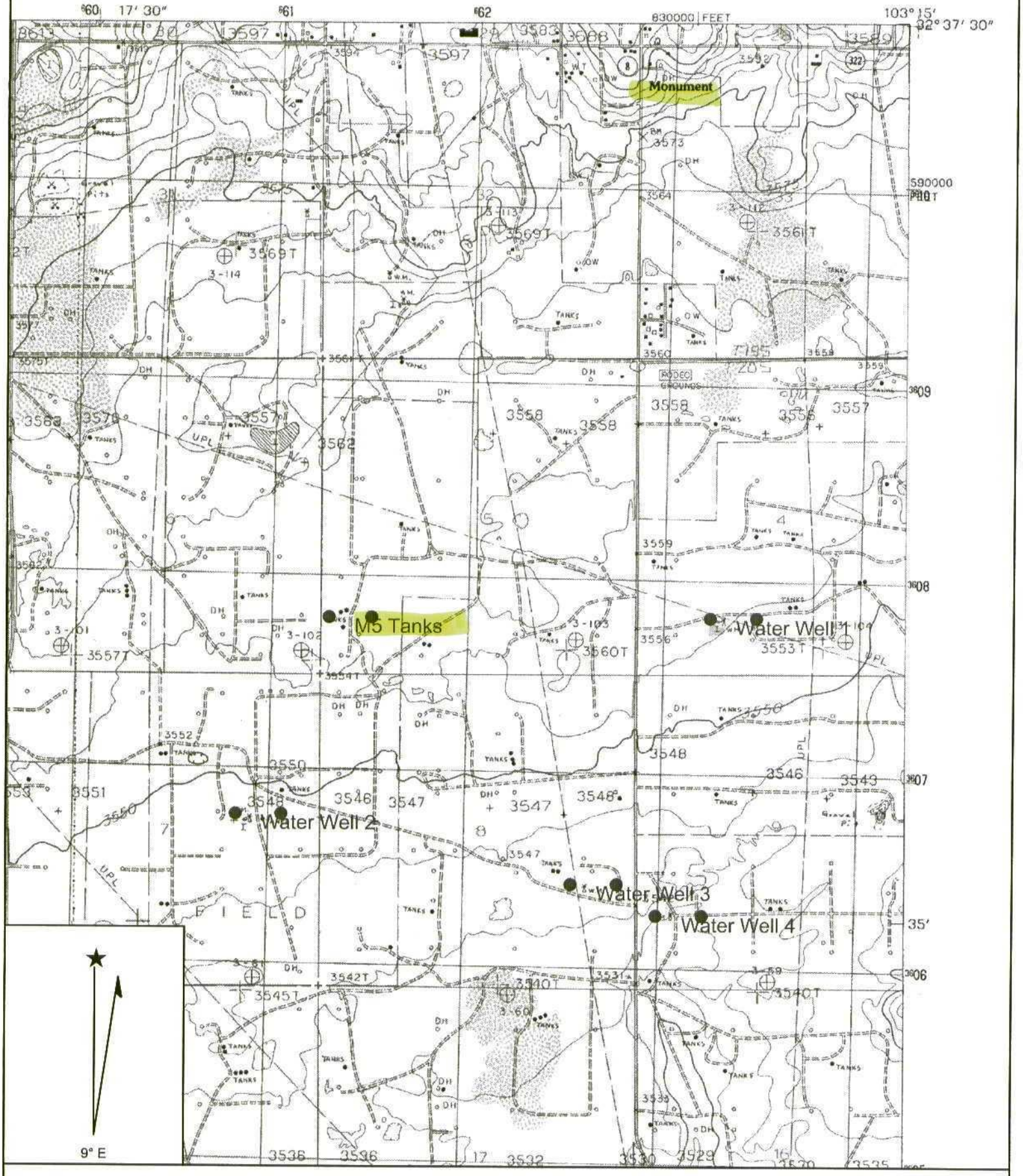
We plan to commence data collection for the HYDRUS1D simulations described above in late August or September. Your approval to move forward with this work plan will facilitate our access to nearby windmills an, approval of expenditures by the System Partners.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy:
Rice Operating Company

7.5 MINUTE SERIES (TOPOGRAPHIC)



Name: MONUMENT SOUTH
Date: 7/7/2003
Scale: 1 inch equals 2000 feet

Location: 13 662205 E 3608045 N

1R0424

Kristin Farris

From: "Price, Wayne" <WPrice@state.nm.us>
To: "'Randall Hicks'" <R@rthicksconsult.com>; "Price, Wayne" <WPrice@state.nm.us>
Cc: <enviro@leaco.net>; "Carolyn Doran Haynes" <cdhriceswd@leaco.net>
Sent: Thursday, October 02, 2003 8:59 AM
Subject: RE: M-5 Tanks

APPROVED!

Please be advised that NMOCD approval of this plan does not relieve Rice Operating Company of liability should their operations fail to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve Rice Operating Company of responsibility for compliance with any other federal, state, or local laws and/or regulations

-----Original Message-----
From: Randall Hicks [mailto:R@rthicksconsult.com]
Sent: Thursday, October 02, 2003 5:58 AM
To: 'Price, Wayne'
Cc: enviro@leaco.net; Carolyn Doran Haynes
Subject: M-5 Tanks

Wayne

Remember that I was going to send you one more workplan for Rice? This is it.

If you can spend a few minutes looking at it then, hopefully approving it, that would be fantastic. We need to get the final AFE for this site approved by the Partners before we proceed. We are trying to coordinate a single field program to do the work at all of these four sites:

Zachary Hinton
B-29
N-29, and
M-5

Please note that my office has a new address and fax number. Same phone number.

Come down to Hobbs and see what we are doing – at least it will not be the July heat.

Randy

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

IRO 424

October 2, 2003

Mr. Wayne Price
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: M-5 Redwood Tanks, Section 5 T20S R37E Unit M

Dear Mr. Price

Rice Operating Company retained Hicks Consultants to address potential environmental concerns at the above referenced site. This submission proposes a scope of work that we believe will best mitigate any threat to human health and the environment and lead to closure of the regulatory file for this site.

Background

The M-5 Redwood Tank Site is located about 2 miles southwest of Monument, New Mexico. Figure 1 shows the location of the site. Mr. Jimmy Cooper is the owner of the land surface at this location. Rice Operating Company (ROC) is the service provider (operator) for the Eunice-Monument-Eumount (EME) Saltwater Disposal System and has no ownership of any portion of pipeline, well, or facility. The EME System is owned by a consortium of oil producers, System Partners, who provide all operating capital on a percentage ownership/usage basis. Major projects require System Partner authorization of expenditures (AFE) approval and work begins as funds are received. We will implement the work outlined herein after NMOCD approval and subsequent authorization from the System Partners.

1. Evaluate Possible Impacts to Soil and Ground Water

The M-5 Redwood Tanks have operated for several decades and will be replaced with tanks that meet more current industry standards. ROC has replaced several such tanks in the past and found that some of these sites caused impairment of ground water quality or have the potential to cause such impairment. The first task of this work assignment is determining the magnitude and extent of any such impairment.

The HYDRUS1D and mixing model simulation, which we plan to employ in Task 2, requires input of 10 parameters. As Table 1 shows, we must collect site specific data for several of these parameters. First we will measure the depth to ground water at nearby windmills and monitoring wells to determine the hydraulic gradient. Figure 1 shows the location of four windmills which we hope to employ in this initial water level

measurement program. We know that several monitoring wells are nearby, such as the ROC well at the P-6 site, west of the tanks. We will employ this well and others to clearly establish the hydraulic gradient of the area and the direction of ground water flow.

Table 1: Input Parameters for Simulation Modeling

Input Parameter	Source
Vadose Zone Thickness	Proposed monitoring well and borings
Vadose Zone Texture	Proposed monitoring well and borings
Dispersion Length	Professional judgment
Soil Moisture	Field Measurements from borings
Vadose Zone Chloride Load	Proposed borings adjacent to the tanks
Length of release perpendicular to ground water flow	Field Measurements
Climate	Pearl, NM station (Hobbs)
Background Chloride in Ground Water	Samples from nearby water supply wells and monitoring wells
Ground Water Flux	Calculated from regional hydraulic data and data from nearby wells
Aquifer Thickness	Nicholson and Clebsch (1960) and SEO data and proposed monitoring well

Because ROC plans to move forward with taking these two tanks out of service and constructing new facilities adjacent to the existing tanks, our work is independent of this replacement program. We plan to collect samples from four boreholes adjacent to the tanks to obtain information for other input parameters.

Near the northwest side of the tanks (up gradient of probable ground water flow), we will install a boring as close as practical to the existing tanks, perhaps between the two tanks. Drilling and sampling will cease in this borehole when we encounter ground water (approximately 30 feet below grade). We propose a second boring 15 feet west of the westernmost tank and a third boring 30 feet east of the easternmost tank. Again, drilling and sampling will cease in these boreholes when we encounter ground water. Sixty feet southeast of the tanks, we plan a fourth boring which we will convert to a monitoring well as described later.

From each boring, we will obtain split-spoon soil samples every five feet of the vadose zone. We will evaluate these discrete samples, the borehole drilling characteristics, and drill cuttings to develop a lithologic profile of the vadose zone. We will employ standard methods, as described in the Junction Box Replacement Program Plan, to evaluate all soil samples in the field for chloride content, TPH and volatile organic

constituent content. We will submit at least one soil sample from each boring to a qualified laboratory for evaluation of chloride and BTEXN (benzene, toluene, ethylbenzene, xylene, naphthalene). The field geologist will identify samples for laboratory analysis after review of the field analysis of chloride, TPH and VOCs. The geologist will select two samples from the first boring and two samples from the fourth boring for laboratory analysis of soil moisture content and bulk density.

After we complete the sampling program described above for the fourth boring, will continue drilling through the saturated zone to the top of the Dockam Group red beds, which form the base of the aquifer in this area. If the saturated thickness of the aquifer in this boring is less than 25 feet, we will install a 2-inch monitoring well with five feet of screen above the water table and 15 feet below the water table, in a manner consistent with industry standards (see NMOCD, ASTM or EPA publications). If the saturated thickness of the aquifer is greater than 25 feet we will install two 2-inch wells in the same boring. We will complete the uppermost well as described above. In the deeper well, we will install 5 feet of well screen above the top of the Dockam Group red beds. If possible, we will isolate the two screened intervals by installing bentonite pellets above the lowermost screened interval.

To establish background chloride concentrations in ground water, we propose to sample Water Wells #1 and #2 on Figure 1. We also plan to employ water analysis from a proposed background monitoring well (MW-3) at the ROC P-6 Line Leak Site (work plan submitted by Trident Environmental).

2. Evaluate Chloride, Benzene and Naphthalene Flux from the Vadose Zone to Ground Water

We propose to employ HYDRUS1D and a simple ground water mixing model to evaluate the potential of any residual chloride and hydrocarbon mass in the vadose zone to materially impair ground water quality at the site. We will employ predictions of the migration of chloride ion, benzene and naphthalene from the vadose zone to ground water in our selection of an appropriate remedy for the land surface and underlying vadose zone. This simulation is the "no action" alternative, which predicts chloride flux to ground water in the absence of any action by ROC. We have selected these three constituents for simulation modeling because each of these constituents exists in the fluids stored in the tanks and each is specifically regulated by New Mexico ground water regulations (WQCC).

We might provide simulations of two "no action" scenarios. For both simulations, we will employ the input parameters to HYDRUS and the mixing model outlined in Table 1. In the first simulation, we will assume that vegetation is not present over the release site (no evapotranspiration) and a minimum aquifer thickness of 10 feet. This will simulate restriction of any released chloride and hydrocarbons to a portion of the underlying aquifer. If this first simulation does not return results that are consistent with the ground water data from the proposed monitoring well (see below), we will increase the aquifer thickness in the mixing model to the total thickness measured in nearby water

supply wells or from the proposed monitoring well. At other sites, we have found that chloride can be distributed throughout the thickness of the aquifer. Employing the entire thickness of the aquifer in the mixing model calculations for chloride may be appropriate for M-5 tank site. Data may show that employing the entire aquifer thickness in the mixing model for hydrocarbons may not be appropriate.

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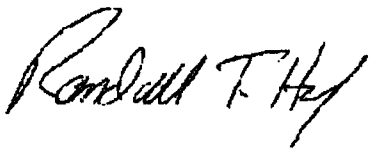

Randall T. Hicks
Principal

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Rice Operating Company

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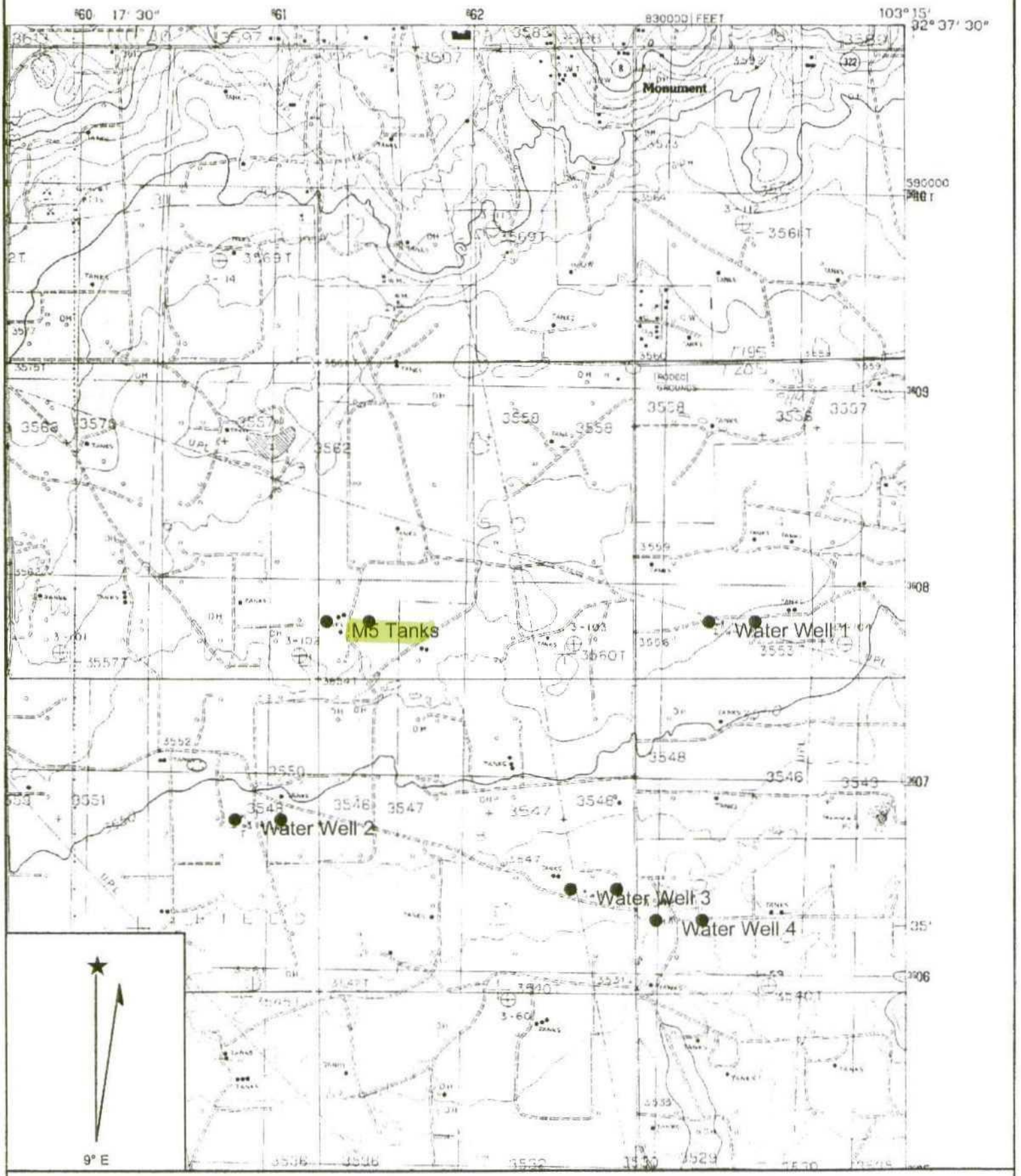

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