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REPORTS

DATE:

Aug 1993

PROPOSED REMEDIAL ACTION PLAN
AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT #181
SECTION 34, T29N, R12W, NMPM
SAN JUAN COUNTY, NEW MEXICO

PREPARED FOR:
MR. BUDDY SHAW
ENVIRONMENTAL COORDINATOR
AMOCO PRODUCTION COMPANY

PROJECT/PIT NO.: 92140/C4456

AUGUST 1993

ENVIROTECH, INC.
Environmental Scientist & Engineers
5796 U.S. Highway 64-3014
Farmington, New Mexico
(505) 632-0615

PROJECT NO: 92140/C4456 AUGUST 1993

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AMOCO PRODUCTION COMPANY
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FARMINGTON, SAN JUAN COUNTY, NEW MEXICO

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August 1993 PROJECT/PIT NO: 92140/C4456

PROPOSED REMEDIAL ACTION PLAN
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GALLEGOS CANYON UNIT COM (I) #181
SECTION 34, T29N, R12W, NMPM
SAN JUAN COUNTY, NEW MEXICO

INTRODUCTION

Amoco Production Company proposes to remediate hydrocarbon contaminated soil and groundwater associated with Gallegos Canyon Unit Com (I) #181, located in the Southeast ¼ of the Northwest ¼ of Section 34, Township 29N, Range 12W, NMPM, San Juan County, New Mexico.

This Remedial Action Plan (RAP) was developed by Amoco and Envirotech, Inc. The proposed action is intended to abate the known hydrocarbon contamination using the most efficient and best available technology. The extent of soil and groundwater contamination has been estimated from field and laboratory data collected by Amoco. The source of contamination is suspected to be from prior discharges to unlined pits and/or pipeline leaks at the subject oil/gas production well location. All discharges are currently to lined pits or tanks.

This RAP proposes the implementation of trench reclamation methodology (TRM) utilizing staged shallow trenching, for groundwater treatment, coupled with ex-situ soil treatment. TRM will enhance naturally occurring, site specific conditions (ie. biodegradation and volatilization) to abate and reduce soil and groundwater contamination at the site.

Full implementation of this RAP will be contingent on the approval of NMOCD.

SCOPE OF SERVICES

The proposed scope of work for this remediation and abatement will consist of:

A. Notification of NMOCD and other appropriate authorities of the intent to remediate the referenced site.

B. Abatement of contaminated areas by implementation of TRM for the enhancement of site specific conditions.

C. Reclamation assessment by testing during the execution of the TRM.

D. Subsequent quarterly testing of groundwater monitor wells to verify successful reclamation and for closure of the site.

E. Documentation of abatement and closure.

SITE DESCRIPTION

The Gallegos Canyon Unit Com I #181 well site is located in the Southeast ¼ of the Northwest ¼ of Section 34, Township 29N, Range 12W. Access to the site is from West Hammond Road in Lee Acres, New Mexico. The site is approximately ¼ mile east of West Hammond Road, and approximately 300-400 yards south of the San Juan River. Refer to the attached Vicinity Map (Appendix A).

The site is an active natural gas well, reportedly producing approximately 67 MCFD from the Dakota Formation. Surface equipment at the site consists of an above ground steel production tank (approximately 300 bbl), and a separator. On site there are four waste liquid pits; one associated with the production tank overflow and separator (single wall steel below grade tank), one for well blow-down (unlined earthen), an abandoned possible drilling/reserve pit (unlined earthen), and a sales/dehydrator pit (recently excavated by El Paso Natural Gas). Refer to the attached Site Diagram (Appendix A) for the approximate location of the referenced well site processing equipment.

The site was reportedly constructed on September and October, 1964 with the well drilled by Pan American Corporation. The site appears to be built by elevating the drilling pad slightly above the surrounding topography. Surface soils are dense, sandy clays to clayey sands with cobbles.

The depth to groundwater is approximately 6'-9' below ground surface with a gradient toward the north-northwest (refer to Groundwater Flow Direction-Groundwater Contour Map-Appendix A).

Surrounding land adjacent to the well location is currently used for pasture and/or hay. Located east of GCU (I) 181 is a 10" transmission pipeline operated by El Paso Natural Gas and another oil/gas well operated by BHP.

SITE ASSESSMENT SUMMARY

In August of 1992, Mr. Kevin Heaton (Amoco Corporation Groundwater Management Section) and Mr. Gary Barker (Amoco Corporation Tulsa Research) perform a site assessment to define the extent and characterize the soil and groundwater contamination at the referenced site. The field exploration consisted of the advancement of 38 test pits to depths on the order of eight feet below the ground surface, installation of 15 monitor wells and periodic sampling and testing of water quality, and integrity verification of transmission and storage vessels/piping.

Test Pits:

All test holes were advanced using a backhoe. Encountered subsurface conditions were logged and grab soil samples were collected from the test holes and field tested following the Field Headspace Method[1] using an HNU organic vapor meter. Additionally, grab water samples were collected from each pit and submitted to Amoco's GMS Laboratory for analyses. Copies of the field notes have been included in Appendix B.

Monitor Wells & Sampling:

At select locations, the 15 groundwater monitor wells were installed in the test pits by: 1) test-hole advancement to approximately five feet below the free water level, 2) placement of temporary 12" PVC casing, 3) construction of monitor well within temporary casing, and 4) removal of temporary casing following backfill. Monitor wells consisted of two inch (2") diameter threaded-coupling schedule 40 PVC casing. A ten foot screen section (0.020" slot size) was set approximately five feet above and approximately five feet below the groundwater level encountered during excavation. The screened interval was gravel packed to a minimum of one foot (1') above the slotted interval with 8-12 gradation silica sand and sealed with 200 mesh bentonite. Blank PVC casing was used to complete the wells to approximately twelve inches above site grade. Each monitor well was secured with a locking cap and/or steel well protector.

Subsequent to installation, the monitor wells were developed and six sampling events have been performed to monitor water quality. During sampling the depth to water, equilibrated temperature, conductivity and pH was measured. During the last two sampling events dissolved oxygen content was also measured in the field.

Water samples were collected in 40 ml VOA vials, preserved with 113 Freon and shipped to the laboratory. All water samples were submitted to Amoco's GMS Laboratory for analyses. Samples were analyze for aromatic hydrocarbons [ie. Benzene, Toluene, Ethyl-benzene and total Xylenes (BTEX)] and Total Petroleum Hydrocarbons (TPH) per EPA Method 8015 (Amoco modified).

In addition to soil and water sampling, product samples from the subject well and adjacent wells were collected and analyzed by GC to characterize the possible hydrocarbon source.

Copies of all available laboratory results and correspondence are included in Appendix C.

Integrity Verification:

Several possible sources other than the unlined impoundments were checked including; the above grade storage tank, wellhead and surface casing, production piping and El Paso Natural Gas's transmission line. Verification included visual inspection of above grade vessels, braden head testing of the well casing, and pressure testing lines and piping. Reportedly no leaks or unusual pressure drops were found.

Conclusions:

The following conclusions were drawn for the site assessment:

1) The source of contamination is most probably located on or near the GCU (I) 181 well location. However, as noted by Mr. Heaton, "no firm conclusions regarding the source can be drawn from the data ...".

2) The contamination had a GC signature similar to heavy diesel or light fuel oil material.

3) The soil contamination involves approximately 2.5 acres (Refer to Appendix A: Sheet 3). The contamination appears to be one to two feet thick and limited primarily to the vadose zone above groundwater.

4) Groundwater contamination is present and involves an area of approximately 3.5 acres using the current State of New Mexico water quality standards for BTEX[1] (Refer to Appendix A: Sheet 4).

5) Groundwater is shallow, on the order of seven feet below the ground surface, with an apparent gradient to the north-northwest (Refer to Appendix A: Sheet 5).

RECLAMATION PROPOSAL

Reclamation Process:

Based on the previously cited information in the site description, it is proposed to mitigate hydrocarbon contamination at the site by implementing TRM to enhance on-site biodegradation and utilize volatilization. Blocks of multiple, parallel intercept trenches, oriented cross gradient to the site groundwater flow will be excavated to groundwater. These intercept trenches will expose contaminated groundwater and soil to the atmosphere and enhance naturally occurring biodegradation, volatilization, and makes photo-degradation possible. As groundwater flows through the site, it will be exposed repeatedly to intercept trenches. The Trench Reclamation Methodology is outlined on Appendix A: Sheet 6.

It is proposed to divided the contaminated area into several blocks, with reclamation trenches emplaced into several blocks at one time. As one block completes remediation, all intercept trenches will be backfilled with clean soils, and another block will then have intercept trenches emplaced into it.

Intercept trenches will be staged within a block. Each stage of intercept trenches will be emplaced as near to each other as possible, with an anticipated distance of 10'-15' between each. As an intercept trench is emplaced, visibly contaminated soils will be thin-spread on-site for landfarming. Clean soils will be stockpiled on-site for use as future backfill material. Intercept trenches will be excavated to a depth of 1'-2' below the encountered groundwater depth, and will be on the order of 24" wide. As one series of intercept trenches achieves reclamation, they will be backfilled with clean soils from their excavation, and a second series (stage) of intercept trenches will be placed in the areas between the backfilled intercept trenches. This process will continue until all on-site soil and groundwater is reclaimed to NMOCD Standards. Temporary security fencing will be erected surrounding each block of intercept trenches, to minimize access and any risk to humans and/or livestock.

Groundwater Treatment:

As groundwater flows through each reclamation trench it will be exposed to the atmosphere. This exposure is anticipated to increase biodegradation within and between the trenches. In addition to the anticipated increased biodegradation, rapid volatilization is anticipated, and photo-degradation is likely. Reclamation is expected to reduce the concentration of hydrocarbon contaminants within the groundwater to below State of New Mexico groundwater standards[1].

Soil Treatment:

During emplacement of the reclamation trenches, visibly contaminated soils will be placed into a pre-designated location for on-site thin-spread landfarming. Contaminated soils that are not excavated will undergo in-situ remediation. This in-situ remediation is expected to be by three distinctly different mechanisms, in three unique contaminant reduction zones. The mechanisms and zones are as follows:

- The first mechanism is volatilization. An anticipated 12"-24" of soil immediately bordering each intercept trench will undergo rapid hydrocarbon volatilization.

- The second mechanism is biodegradation. As groundwater re-enters the soils between intercept trenches, it contains increased levels of dissolved oxygen. This oxygen is expected to greatly enhance hydrocarbon biodegradation in the soil, within the first 7'-10' of soils encountered.

- The third mechanism is dissolution/advection (contaminant dissolves into and/or moves with the groundwater mass). As groundwater percolates through the soils between the intercept trenches, is anticipated to both dissolve and advect hydrocarbons, providing a "washing" effect on the contaminated soils. After hydrocarbons are moved into the succeeding intercept trench, they are treated, as per outlined in the above section.

Closure and Monitoring Plan:

To determine successful abatement the following sampling and testing will be performed.

1) During execution of the TRM, water samples will be collected from each trench and analyzed for BTEX. Once groundwater in a trench is below standards[1], it will be backfilled with clean soils.

2) The landfarmed soils will be sampled by a minimum of one (1) composite soil sample per 10,000 square feet of landfarmed soil (100' X 100') and analyzed for hydrocarbon contamination. Five (5) grab soil samples collected arbitrarily from the sample area will be used for the composite sample. Samples are to be tested for total petroleum hydrocarbons (TPH) per EPA 418.1 (soil modification) and total volatile organic vapors per the Field Soil Vapor Headspace Method[1]. The remediation levels for this site are based on a NMOCD "Ranking Score" of >19 [ie: Organic Vapors and TPH < 100 ppm][1].

3) Following completion of the entire site reclamation by TRM, groundwater contaminant concentrations will be monitored in the four down-gradient monitor wells (MW #15, MW #17, MW #25, MW #31). All other monitor wells are anticipated to be destroyed during the reclamation. Monitoring will consist of sampling groundwater and analyzing for BTEX constituents, using USEPA Method 8020. Monitoring will be quarterly for eight quarters. If no elevated levels of contamination are found during the monitoring, no further reclamation, sampling or testing will be necessary.

Installation of the reclamation system will be initiated upon receipt of the NMOCD approval of the remedial action plan.

CLOSURE & LIMITATIONS

This remedial action plan has been prepared for the exclusive use of Amoco Production Company as it pertains to their Gallegos Canyon Unit (I) #181 in the Southeast ¼ of the Northwest ¼ of Section 34, Township 29N, Range 12W, NMPM, San Juan County, New Mexico.

The plan is based on information obtained by Amoco Production Company concerning the extent of soil and groundwater contamination at the GCU (I) 181 well site.

All work will be performed in accordance with generally accepted professional practices in construction, excavation and geotechnical/environmental/petroleum engineering.

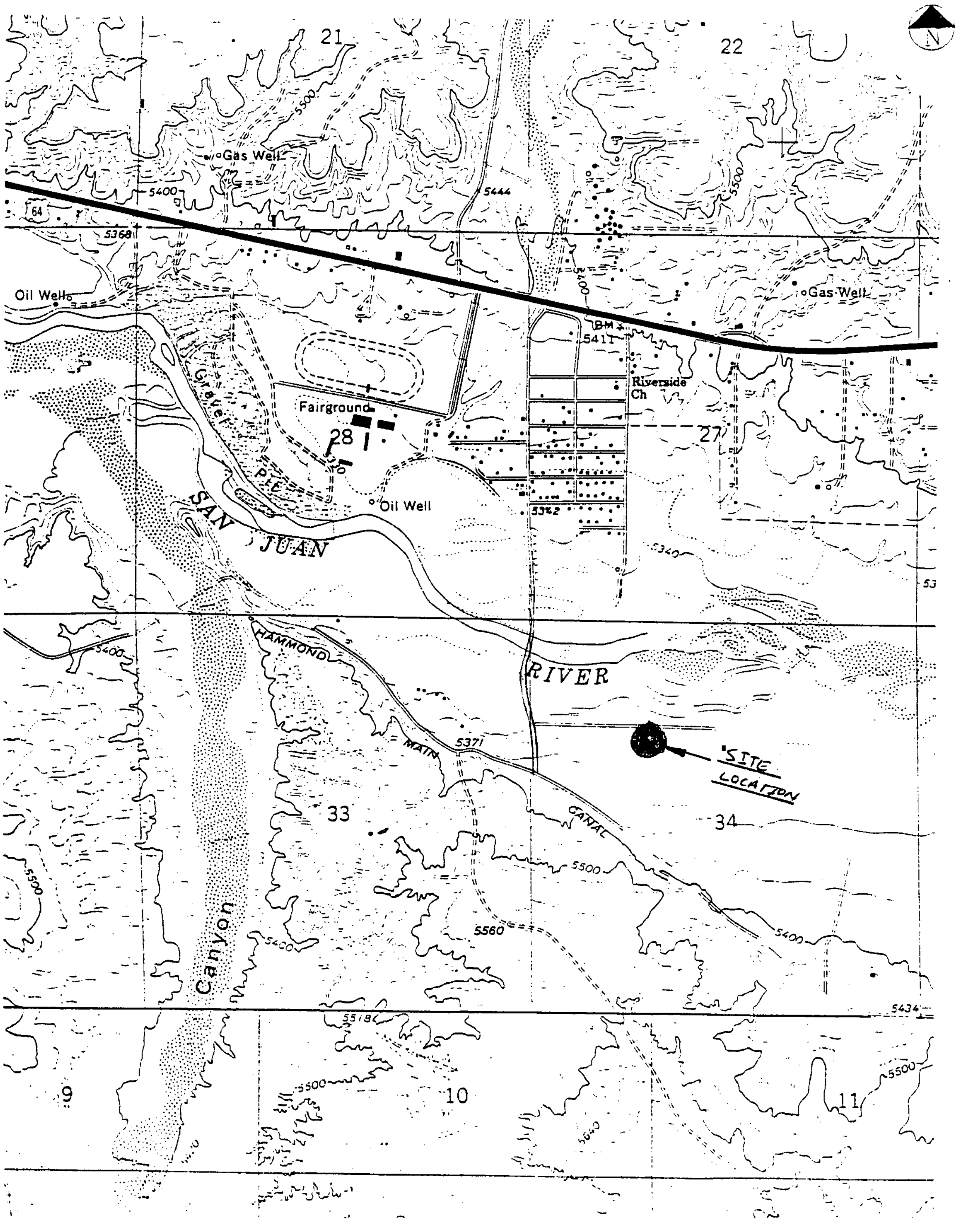
Respectfully Submitted,
ENVIROTECH, INC.

Michael K. Lane, P.E.
Geological Engineer

Jeffrey C. Blagg, P.E.
Geological Engineer

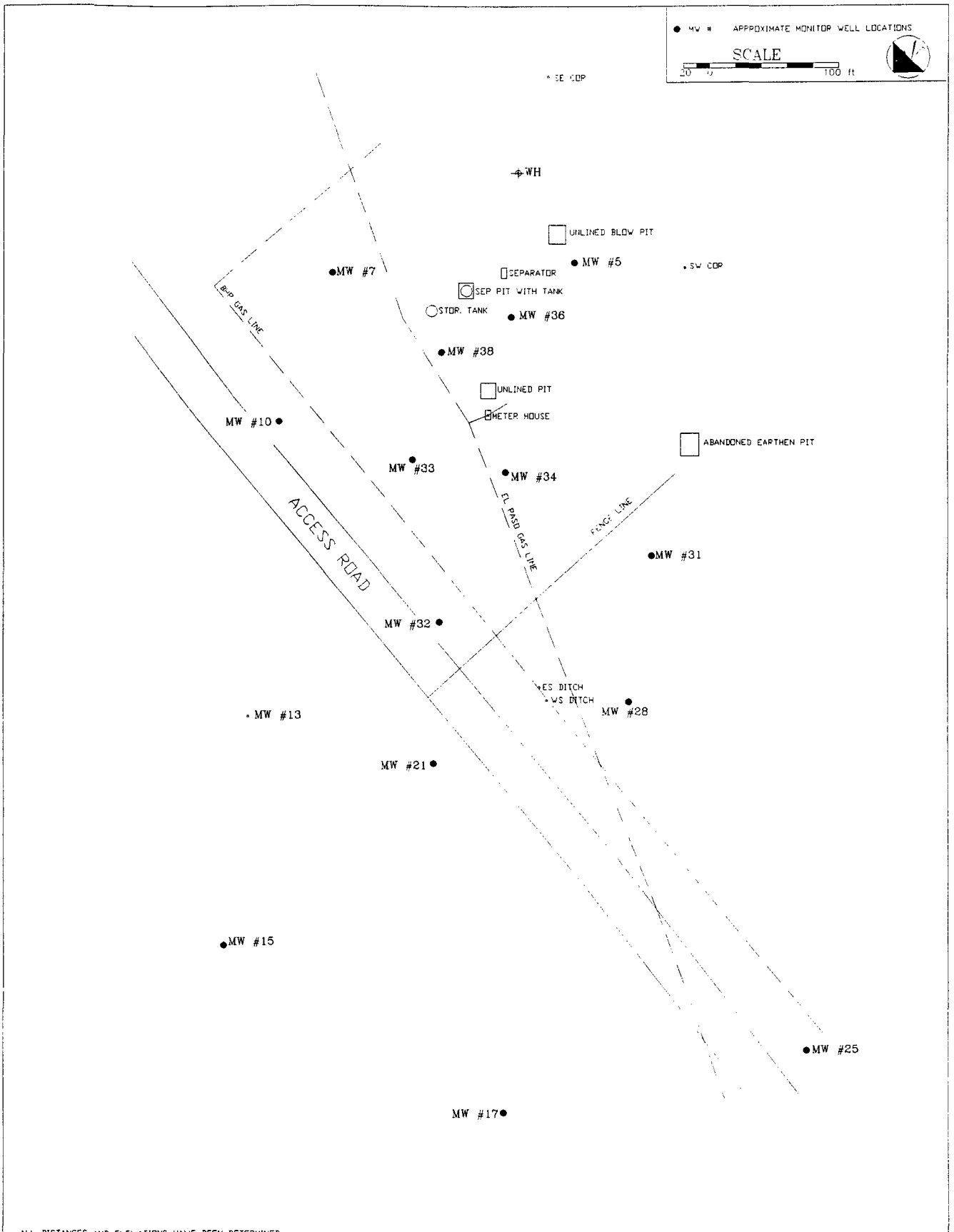
References:

(1) "Unlined Surface Impoundment Closure Guidelines" (February 1993), State of New Mexico, Oil Conservation Division (NMOCD).



DRWG GCU181VM

AMOCO PRODUCTION COMPANY GALLEGOS CANYON UNIT 181 SEC. 34 TWP 29N RNG 12W SAN JUAN COUNTY, NEW MEXICO	VICINITY MAP	SHEET: 1 DRAWN: 8/04/93 DRAWN BY: RMI PR MGR: JCB	ENVIROTECH INC. ENVIRONMENTAL SCIENTISTS & ENGINEERS 5796 U.S. HIGHWAY 64-3014 FARMINGTON, NEW MEXICO 87401 PHONE: (505) 632-0615



ALL DISTANCES AND ELEVATIONS HAVE BEEN DETERMINED BY SIGHTING, PACING AND SURVEYING. MEASUREMENTS ARE NO MORE ACCURATE THAN THE METHOD USED.

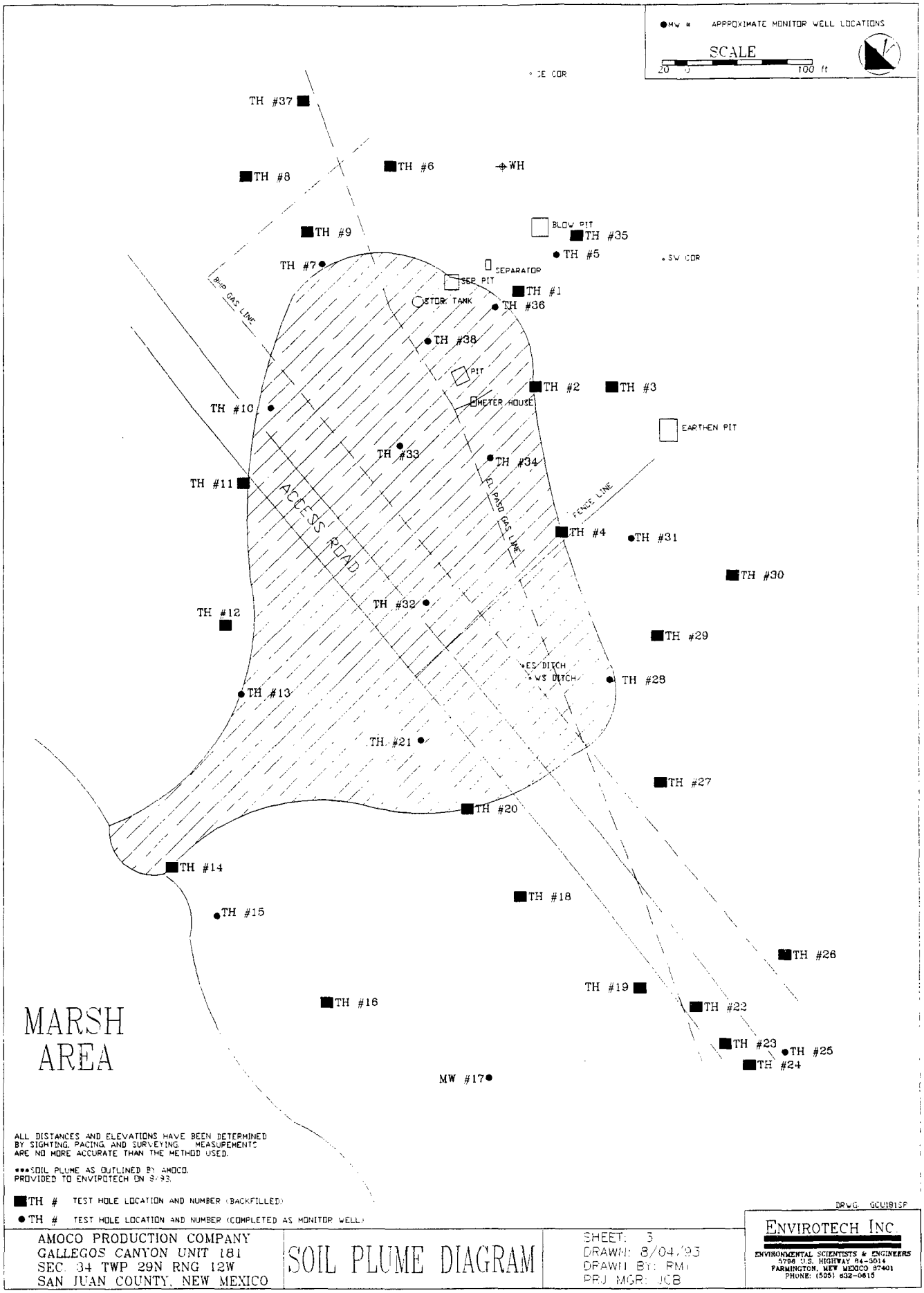
DRWG: GCU181MV

AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT 181
SEC. 34 TWP 29N RNG 12W
SAN JUAN COUNTY, NEW MEXICO

SITE DIAGRAM

SHEET: 2
DRAWN: 4/16/93
DRAWN BY: PMY
PRJ MGR: JCB

ENVIROTECH INC
ENVIRONMENTAL SCIENTISTS & ENGINEERS
5796 U.S. HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615



DRWG: GCU181SP

AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT 181
SEC. 34 TWP 29N RNG 12W
SAN JUAN COUNTY, NEW MEXICO

SOIL PLUME DIAGRAM

SHEET: 5
DRAWN: 8/04/93
DRAWN BY: RMT
PRJ MGR: JCB

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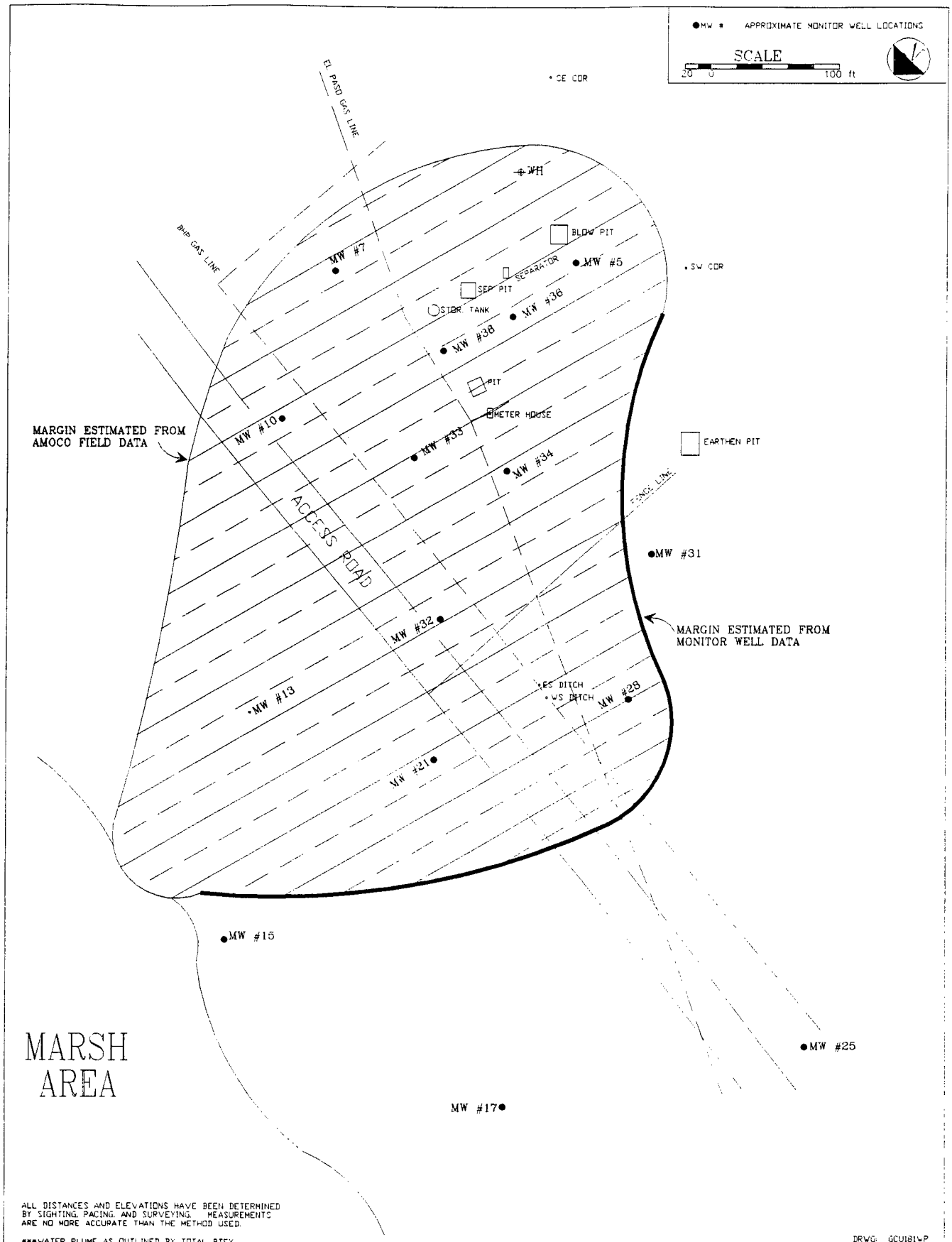
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615



ALL DISTANCES AND ELEVATIONS HAVE BEEN DETERMINED BY SIGHTING, PACING, AND SURVEYING. MEASUREMENTS ARE NO MORE ACCURATE THAN THE METHOD USED.

***WATER PLUME AS OUTLINED BY TOTAL BTEX CONCENTRATIONS, SAMPLED 9/92.

DRWG: GCU181WP

AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT 181
SEC. 34 TWP 29N RNG 12W
SAN JUAN COUNTY, NEW MEXICO

GROUNDWATER PLUME DIAGRAM

SHEET: 4
DRAWN: 8/04/93
DRAWN BY: FM
PRJ MGR: JCB

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FARMINGTON, NEW MEXICO 87401
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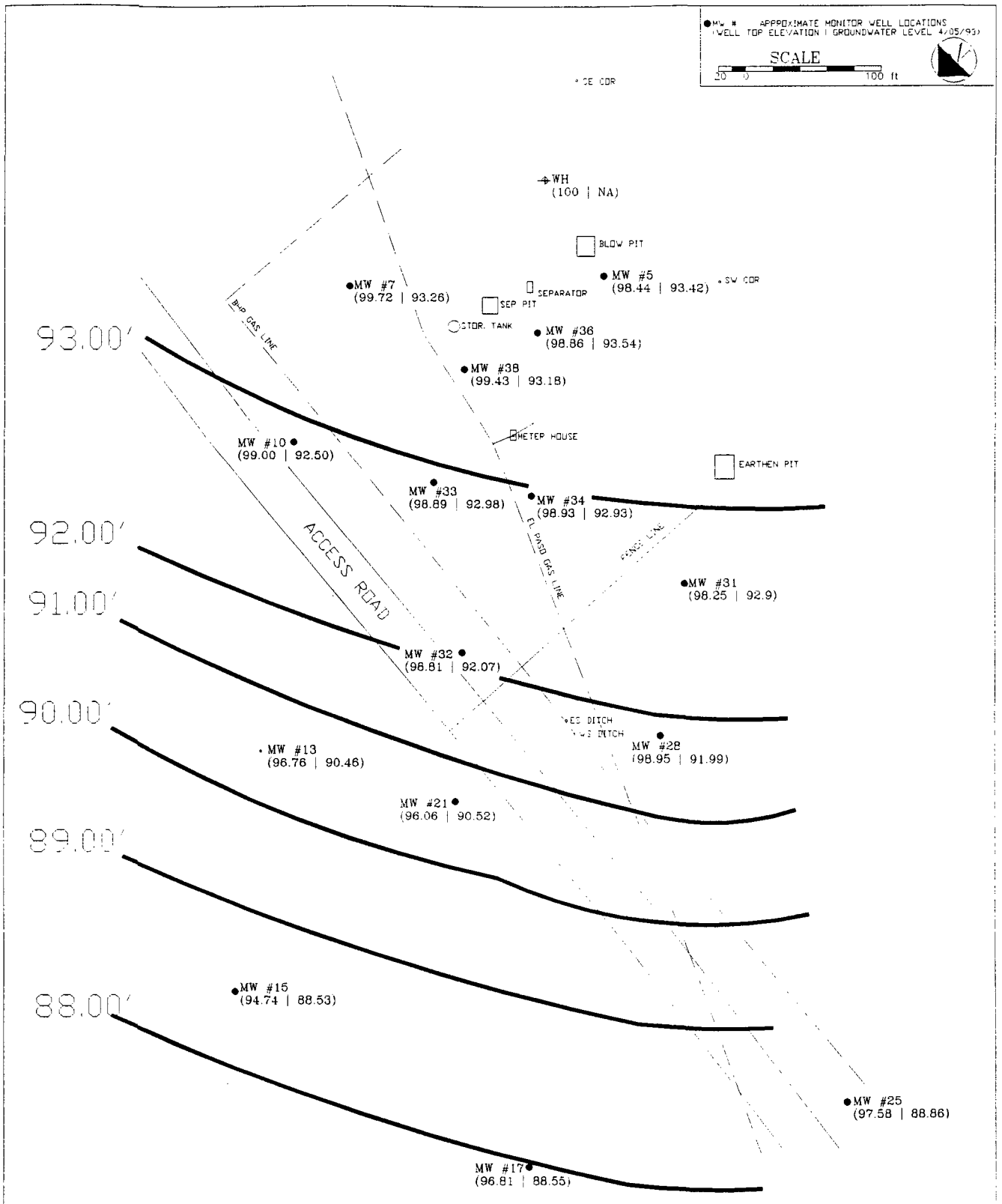

ALL DISTANCES AND ELEVATIONS HAVE BEEN DETERMINED BY SIGHTING, PACING AND SURVEYING. MEASUREMENTS ARE NO MORE ACCURATE THAN THE METHOD USED.

DRWG: GCU181GW

AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT 181
SEC. 34 TWP 29N RNG 12W
SAN JUAN COUNTY, NEW MEXICO

GROUNDWATER FLOW DIRECTION
GROUNDWATER CONTOUR MAP

SHEET 5
DRAWN: 4-16-93
DRAWN BY: RMT
PRJ. MGR: JCB

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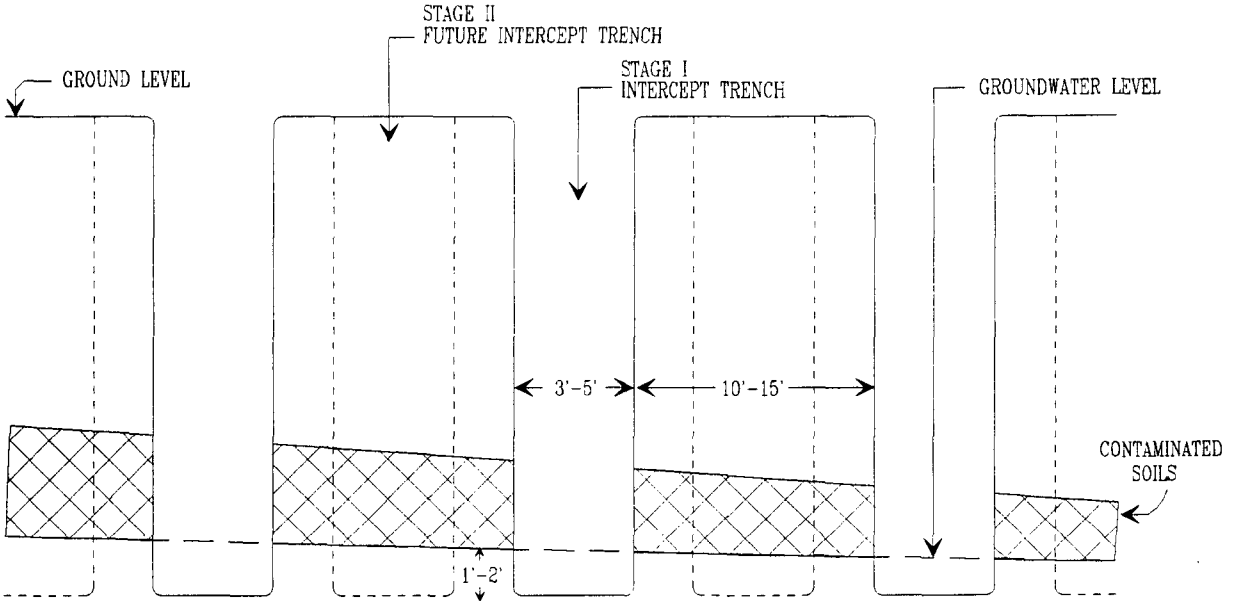
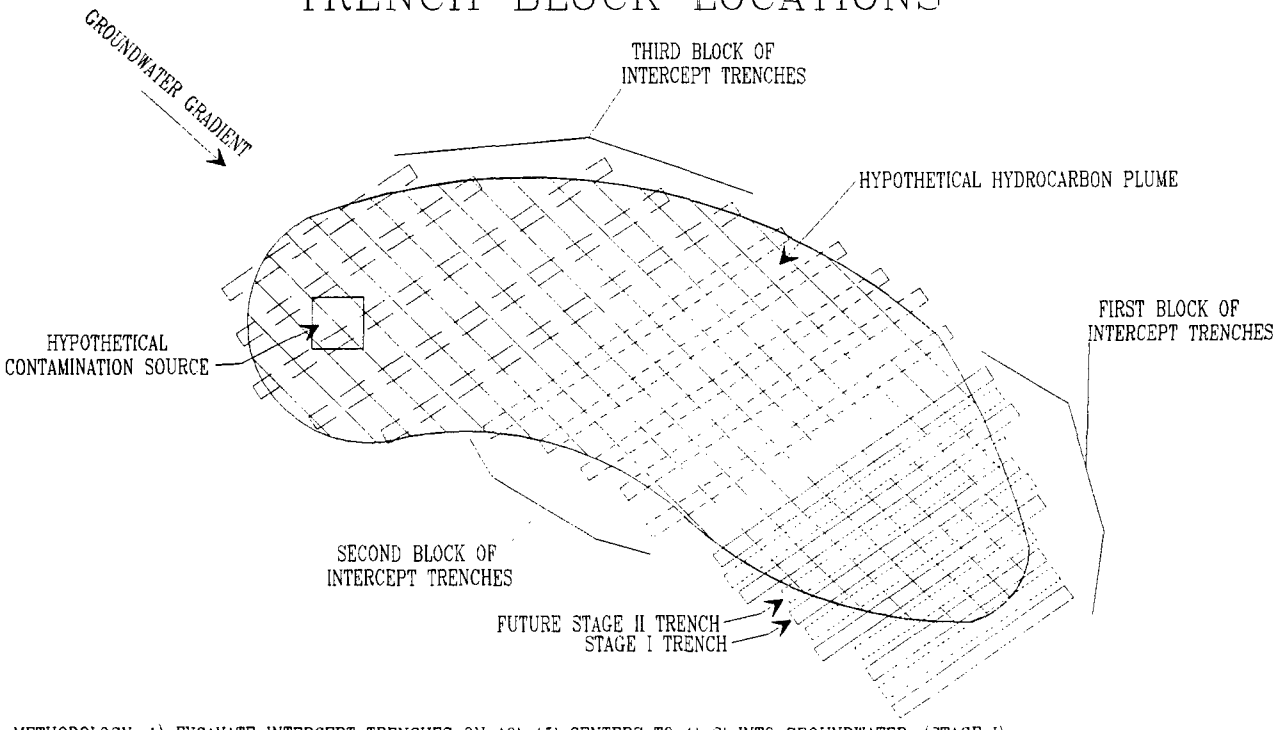
TRENCH BLOCK CROSS SECTION



TRENCH BLOCK LOCATIONS



METHODOLOGY: 1) EXCAVATE INTERCEPT TRENCHES ON 10'-15' CENTERS TO 1'-2' INTO GROUNDWATER. (STAGE I)
2) TESTING OF GROUNDWATER QUALITY, BACKFILLING WHEN BELOW ACTION LEVELS.
3) RETRENCH BETWEEN PRIOR TRENCHES. (STAGE II)
4) STOCKPILE CLEAN TOP SOILS AND OVERBURDEN.
5) ON-SITE LANDFARM OF CONTAMINATED SOILS.

DRWG: GCU181RT

AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT 181
SEC. 34 TWP 29N RNG 12W
SAN JUAN COUNTY, NEW MEXICO

CONCEPTUAL TRENCH RECLAMATION METHODOLOGY

SHEET: 6
DRAWN: 8/04/93
DRAWN BY: PM
PRJ MGR: JCB

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ENVIRONMENTAL SCIENTISTS & ENGINEERS
5796 U.S. HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

SHEET NO. OF

Amoco Production Company

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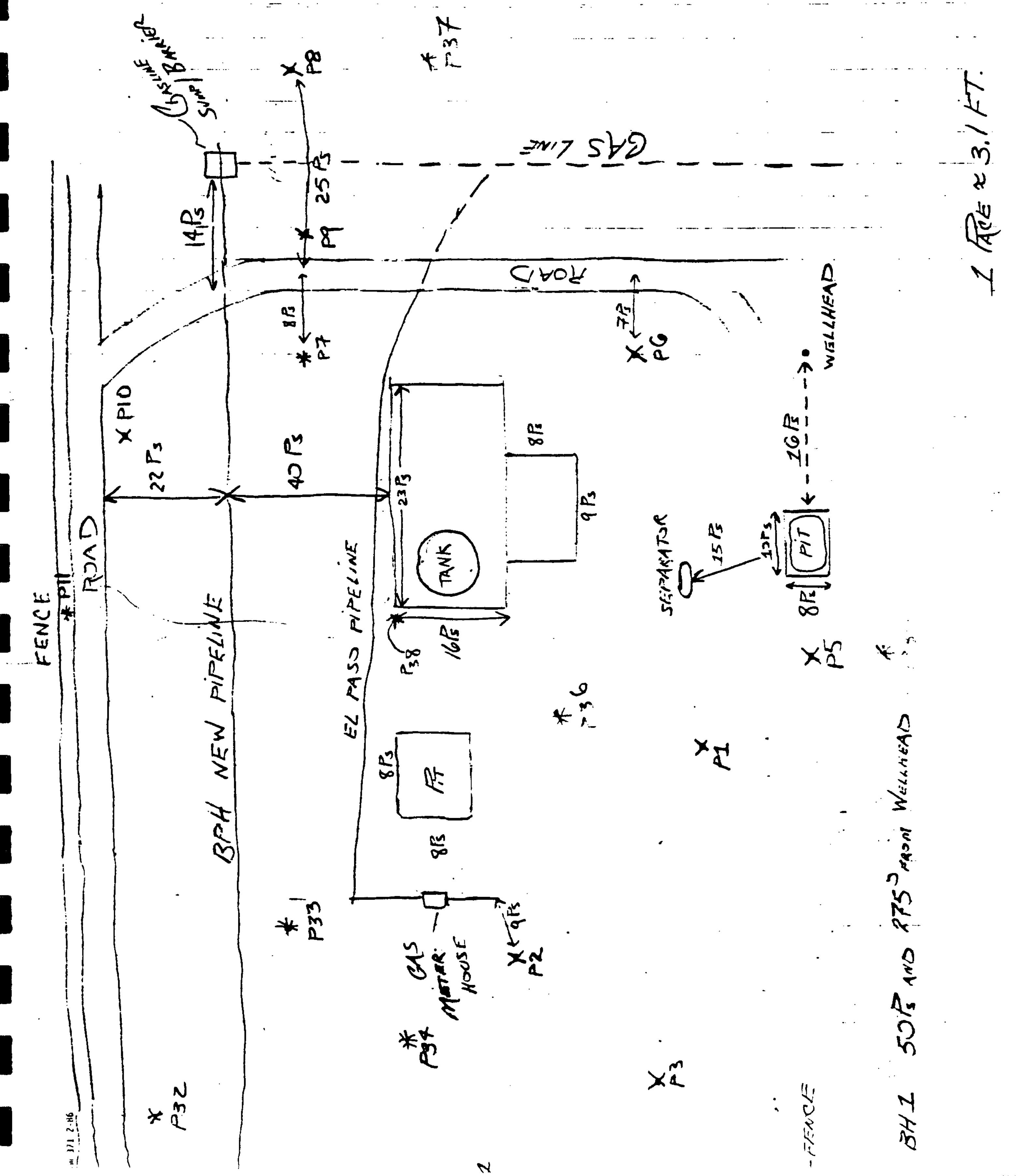
FILE

APPN

DATE

BY GAS

SUBJECT Amoco GC-18I Cu -



Amoco Production Company

ENGINEERING CHART

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BY _____

PIT #1 - 50 Ps AND 280° FROM WELLHEAD

5' to GW
SANDY LOAM / LOAMY SAND
NO CONTAM.
HNU - 7.5 ppm HEADSPACE

BACKGROUND 1.5 ppm

PIT #2 - 73 Ps AND 295° FROM WELLHEAD

5' to GW
SANDY LOAM / LOAMY SAND
CONTAM. CA 4' BELOW SURFACE TO GW
? FREE PRODUCT SHEEN ON GW OBSERVED
HNU - 260 ppm HEADSPACE
70 ppm 3' INTO PIT

PIT #3 - 88 Ps AND 278° FROM WELLHEAD

7' - ~~7.5'~~ TO GW
ABUNDANT CLAY - NOT NOTED IN P1, P2
VISUALLY NO CONTAM., NO ODOR
HNU HEADSPACE - 11 ppm

PIT #4 - 118 Ps AND 290° FROM WELLHEAD
8 Ps TO FENCE

7.5' to GW
4' to TOP OF ZONE OF CONTAMINATION
SCRAPING BEDROCK OR COBBLES @ 8'
HNU HEADSPACE - 220 ppm

NOTE: 1 PACE (P) ≈ 3.1 FT.

Amoco Production Company

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FILE

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SUBJECT

PIT #5 31 FT AND 258° FROM WH (8 FT WEST OF PIT)

5' to GW
SANDY LOAM / LOAMY SAND
CLEAN - NO CONTAM.

STREAKS OF BLACK ORGANIC MATERIAL.

HNU HEADSPACE - 6 ppm BACKGROUND = 1.5 ppm

PIT #6 26 FT AND 0° FROM WH

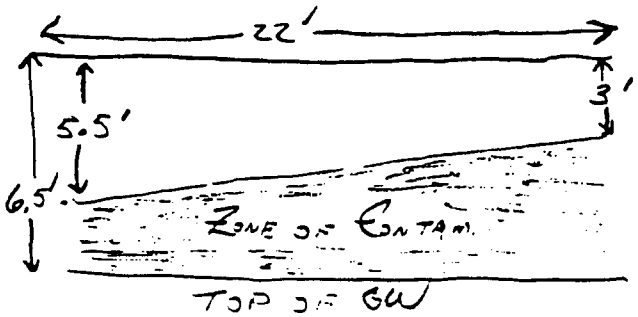
6.5' to GW
CLAY RICH FROM SURFACE TO CA 4'
SANDY LOAM / LOAMY SAND FR 4-7' DEPTH

HNU - 6 ppm BACKGROUND 1.5 ppm

PIT #7 65 FT AND 357° FROM WH

6.5' to top GW
DEPTH TO TOP OF ZONE OF CONTAM VARIES (SEE BELOW)
CLAY AND SAND, CLAY RICH
N-S X-SECTION OF PIT ⇒ N

HNU HEADSPACE = 29



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PIT #8 76 FS AND 23° FROM WH

6.5' to Top GW
SANDY / CLAY LOAM
NO CONTAM - VISUAL OR ODOR
HNU - 5.5 ppm (HS)

HS = HEADSPACE

PIT #9 67 FS AND 10° FROM WH

6.5' to TOP GW
SANDY / CLAY LOAM
NO CONTAM - VISUAL OR ODOR
HNU - 7 ppm (HS)

PIT #10 342° FROM WH; 10 FS SOUTH OF E-W ROAD ON NORTH BOUNDARY

7' to TOP GW
5' to TOP CONTAMINATION
SANDY LOAM
HNU - 250 ppm (HS)

PIT #11 IMMEDIATELY NORTH OF E-W ROAD, BETWEEN ROAD AND FENCE (338° FROM WH)
81 FS FROM WEST CATTLEGUARD

7' to TOP OF CONTAM.
7.5' to TOP GW

M... L... C...

Amoco Production Company

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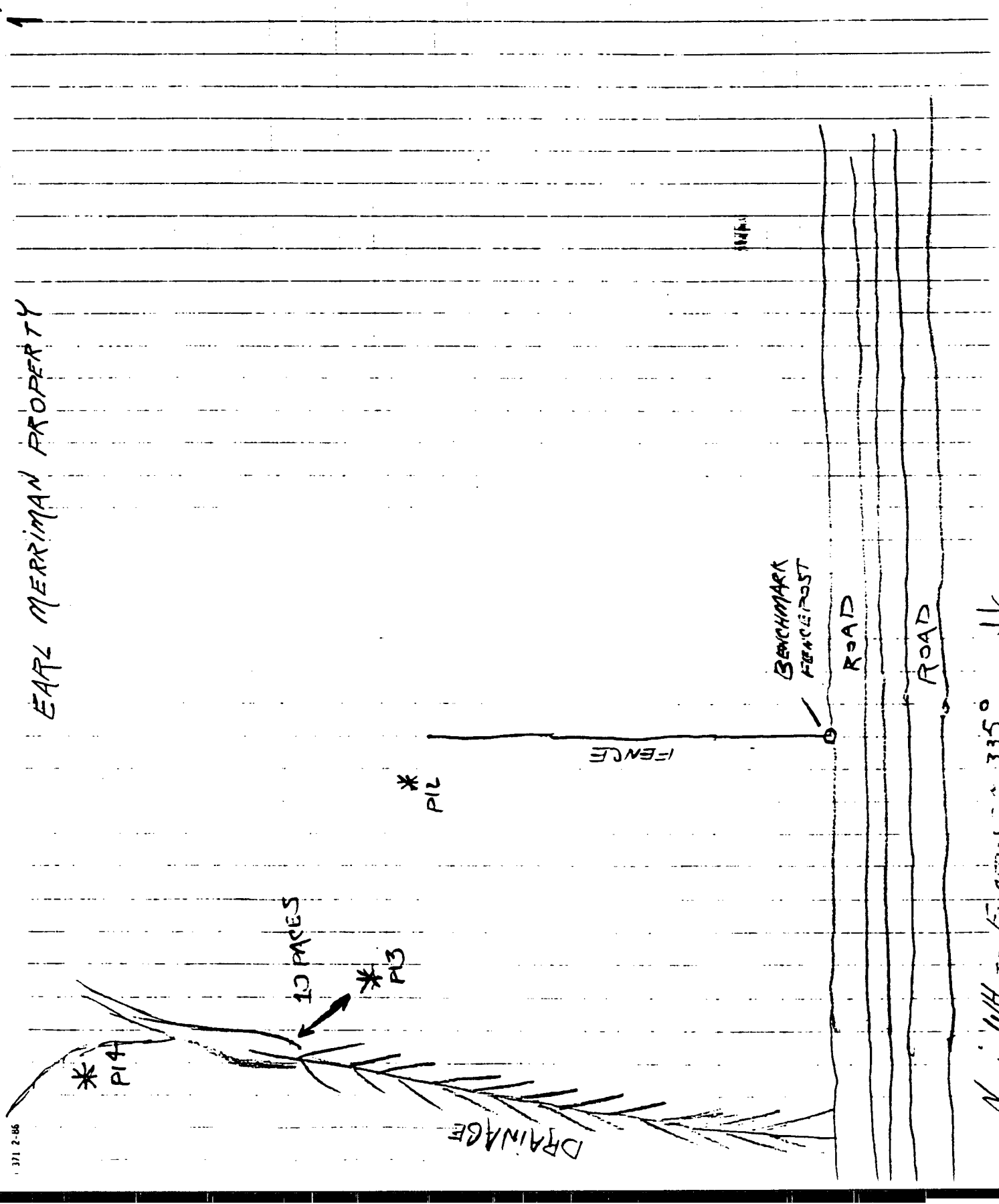

311 2-86

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Pit #12 30 FS AND 346° FROM FENCE POST

6.5' to TOP GW
No Contam - visual or odor
V. Sandy Loam

Pit #13

4'10" to top of Contam.
6'10" to top of GW

Monitor Well

Contam. - visual and odor

Sandy Loam

HNU Headspace = 200 ppm

Monitor Well Installed in Pit #13

Earl Merriman - Buddy called at 1:10 P.M. on 8/5/92
Got verbal OK to excavate with backhoe

371 2-86

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Pit #14 307° from fencepost
330° from Pit #13

Soils clay rich to sandy

Contaminated - visual + odor

HNU (Headspace) of GW from Pit #14 was 45 ppm

Pit 15 298° From Fencepost

Top of GW @ 6' Monitor Well

Soil clay rich 0-5' depth
Sandy soil 5-6'
with cobbles
Soil - no HC odor
Water has HC odor

Pit 16 285° From Fence Post

Sandy loam - abundant clay
11'4" to top of GW Monitor Well
Cobbles at 11'4"

Soil appears clean
GW has HC odor

371 2-86

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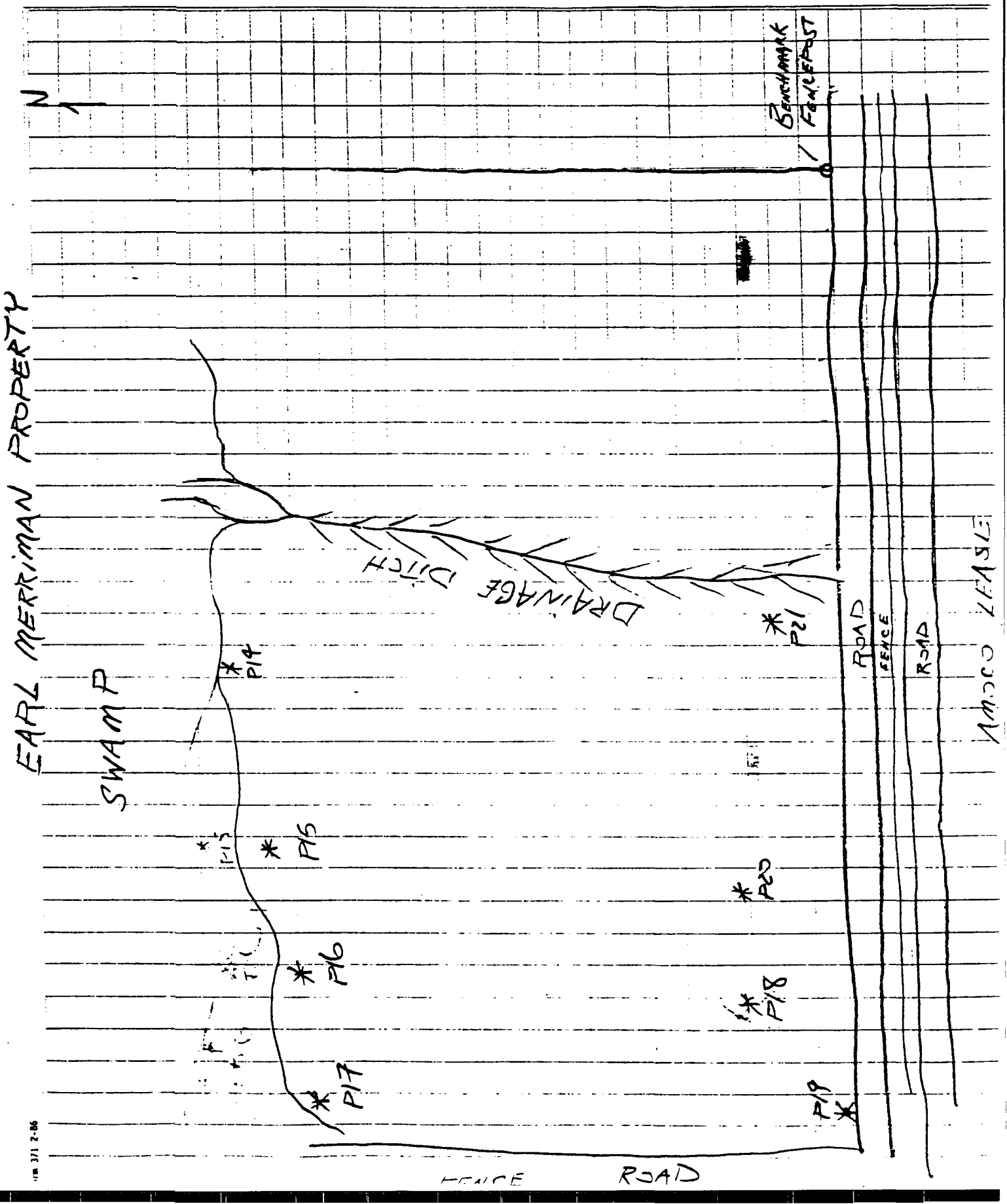

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P17 38 Ps EAST OF WEST BOUNDARY FENCE
9.5' TO GW
MONITOR WELL SAND AND COBBLES 0-5' SAND (MEDIUM)
5-9.5' SAND & COBBLES
SOIL AND GW - NO VISUAL OR HYDROCARBON ODOR
HNU (HEADSPACE) - 5ppm BACKGROUND 1.5pp

P18 18 Ps NORTH OF SOUTH BOUNDARY FENCE
10'6" TO TOP OF GW
0-9' SANDY LOAM - ABUNDANT CLAY
9-10'6" ABUNDANT COBBLES
NO VISUAL OR ODOR CONTAM. IN SOIL
GW - NO VISUAL OR ODOR CONTAM.
HNU (HEADSPACE) - 3ppm BACKGROUND 1pp

P19 6Ps EAST OF WEST BOUND FENCE ADJACENT (DIRECTLY N) OF E-W ROAD
8.5' TO TOP GW
SANDY LOAM HNU - 4ppm BACKGROUND 1.5
NO COBBLES
NO CONTAM - VISUAL OR ODOR

P20 15Ps NORTH OF SOUTH BOUNDARY FENCE
9.5' TO TOP GW
8' TO TOP CONTAMINATION
HNU - 35ppm
CLAY RICH SANDY LOAM HNU (HEADSPACE) = 1.5

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Amoco Production Company

ENGINEERING CHART

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PIT 21 IMMED. WEST OF DRAINAGE DITCH

6' TO TOP GW

4' TO TOP CONTAM.

(MONITOR WELL)

0-4' DEPTH CLAY RICH LOAM

4-6' DEPT SANDY LOAM

HNU (HEADSPACE) - 250 PPM

CONTAMINATION - VISUAL & ODOR

SHEET NO. OF

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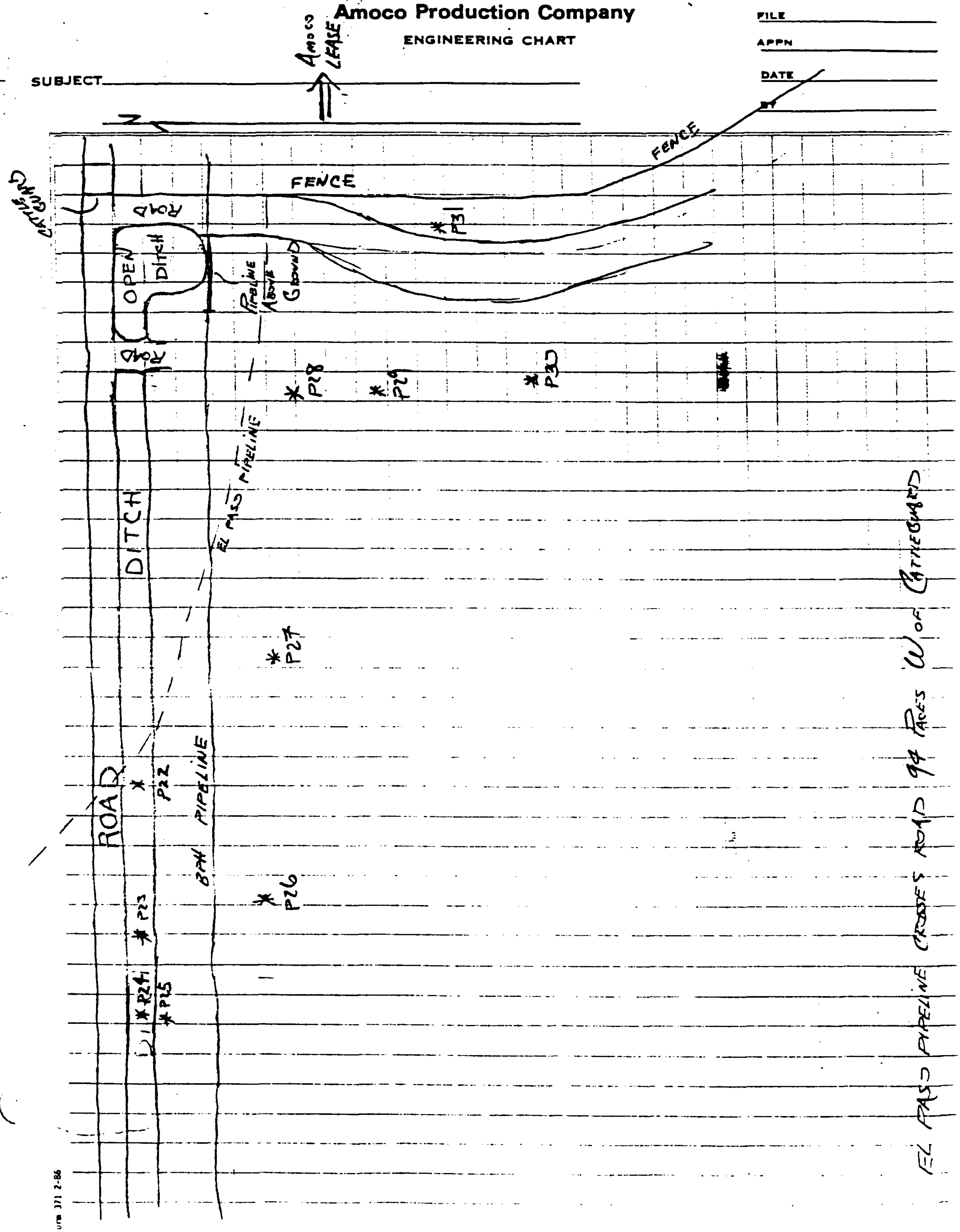
Amoco Production Company

ENGINEERING CHART

SUBJECT



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Amoco Production Company

ENGINEERING CHART

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BY

SUBJECT

TOC

PIT 22 IN DITCH 106 Ps WEST OF CATTLEGUARD

8' TO TOP GW
6' TO TOP ~~OF~~ ZONE OF DISCOLORATION

SANDY LOAM
SOIL AND GW CONTAM.?

HNU - 4.5ppm

P23 IN DITCH 34 Ps WEST OF PIT 22
DUE SOUTH OF PIT 19

9' TO TOP GW
7.5' TO TOP ZONE OF DISCOLORATION

SANDY LOAM
[illegible]

"SWAMP GAS SMELL"
TO GW

HNU SOIL - 3ppm

P24 22 Ps WEST OF PIT 23, IN DITCH

9' TO TOP GW
SANDY LOAM
~~NO CONTAM. IN SOIL - VISUAL OR ODOR~~
FAINT HC ODOR IN SOIL - NO DISCOLORATION
?FAINT HC ODOR IN GW (?SWAMP GAS?)

HNU SOIL 8ppm

371 2-86

Amoco Production Company

ENGINEERING CHART

FILE

APPN

SUBJECT

DATE

BY

PIT 25 OFFSET 4 Ps SOUTH OF P24, IMMED. ADJACENT TO DRAINAGE DITCH

MONITOR WELL

11' TO TOP GW

11' TO TOP ZONE OF DISCOLORATION

0-11' LOAMY SAND
AROUND CLAY

— "HARDPAN" ON TOP OF COBBLES/SAND

11'-? COBBLES/SAND

HNU-SOIL 4 ppm

PIT 26 8 Ps SOUTH OF BPH PIPELINE

11' TO TOP OF GW (SANDY LOAM)
8' TO TOP OF ZONE OF DISCOLORATION

12' TO HARDPAN

HNU SOIL - 6 ppm

PIT 27 12 Ps SOUTH OF BPH PIPELINE

9' TO TOP GW

SANDY LOAM - WITH CLAY

NO DISTINCT ZONE OF COLORATION

HNU (SOIL) - 1.5 ppm

11-2-88

Amoco Production Company

ENGINEERING CHART

FILE

APPN

SUBJECT

DATE

BY

Pit #28 14 Ps SOUTH OF El Paso PIPELINE

7' TO TOP GW

5.5' TO TOP ZONE CONTAM.

CONTAMINATED - VISUAL & ODOR!

CONTAM. ON WEST END OF PIT

NO CONTAM. ON EAST END

SANDY LOAM

HNU (Soil) 220 ppm

Pit #29 19 Ps SOUTH OF P28

7' TO TOP GW

0-5.5' TO TOP GOOD SAND

0-5.5' SANDY LOAM

5.5'-7' GOOD SAND

Soil
No Contam - Visual or Odor

GW HAS SLIGHT HC ODOR

HNU soil - 4 ppm

SHEET NO. OF

Amoco Production Company

ENGINEERING CHART

FILE

APPN

DATE

BY

SUBJECT

PIT #30 50 Ps SOUTH OF PZ9

6.5' to GW
SANDY LOAM WITH ABUND CLAY
SOIL - NO VISUAL CONTAM., NO ODOR
GW - NO ODOR
MEDIUM TO COARSE SAND AT GW
HNU - 5 ppm

PIT #31 8 Ps WEST OF FENCE, ADJ. TO ROAD

6' TO GW
SOIL & GW - NO HC ODOR
SANDY LOAM
HNU - 6 ppm

MONITOR WELL

PIT #32 9 Ps SOUTH OF ROAD, 14 Ps EAST OF FENCE

7' TO TOP GW
4'7" TO TOP CONTAM.
SANDY LOAM
HNU - 250 pp

2-86

SHEET NO. OF

Amoco Production Company

ENGINEERING CHART

FILE

APPN

SUBJECT

DATE

BY

PIT #33 12 Ps SOUTH OF BHP PIPELINE

7' TO TOP GW
5.5' TOP CONTAM. MONITOR WELL
SAND TO SANDY LOAM
CONTAMINATED SOIL/GW (VISUAL/ODOR)
HNU - 200 PPM

PIT 34 17 Ps WEST OF METER HOUSE

6.5' to GW (TOP)
4.5' to TOP CONTAM.
SAND to SANDY LOAM

HNU - > 200 ppm COMING OUT OF PIT
HNU SOIL 220 ppm

Ps 35-38 MASTER NOTEBOOK
FIELD NOTEBOOK

371 2-86

$$\text{Gradient} = \frac{\approx 4 \text{ ft}}{450 \text{ ft}} = .0089 \approx .010 - .008$$

Velocity

Sandy Loam

Loamy Sand Gray Barkers basic description of soils

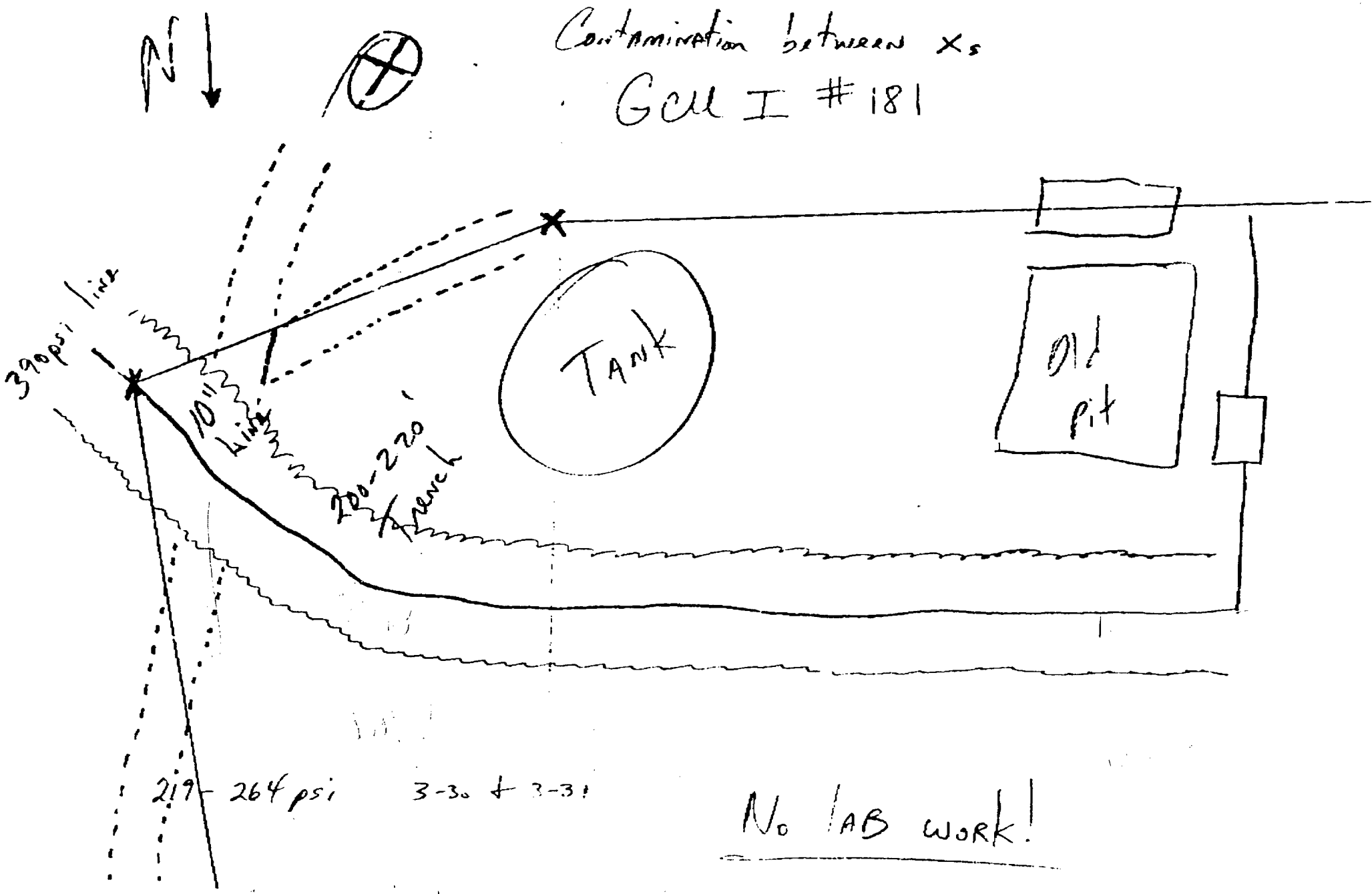
Freeze & Cherry $10^{-5} - 10^{-1}$ cm/sec assume 10^{-3}

$v = \frac{Ki}{n}$ $n \approx .2 - .3$

$Q = -kA\frac{dh}{dL}$

$$V = 1 \times 10^{-3} \frac{\text{cm}}{\text{sec}} \cdot \frac{.010}{.2} \cdot \frac{60 \text{ sec}}{\text{min}} \cdot \frac{60 \text{ min}}{\text{hr}} \cdot \frac{24 \text{ hr}}{\text{day}} \cdot \frac{\text{in}}{2.54 \text{ cm}} \cdot \frac{\text{ft}}{12}$$

$$= .14 \frac{\text{ft}}{\text{day}}$$


N
Contamination between Xs
Well I #181
390psi line
10" line
200-220' trench
TANK
Old pit
219-264 psi
3-30 & 3-31
No LAB work!

SHEET NO OF

FILE

APPN

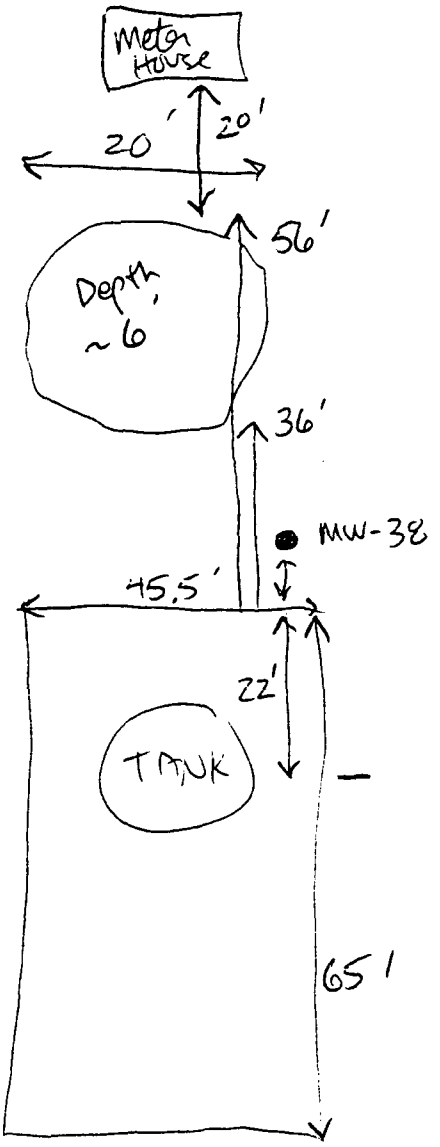
DATE

BY

Amoco Production Company

ENGINEERING CHART

SUBJECT GCU 181



Form 371 2-86

ENVIROTECH INC.

UNDERGROUND TANK TESTING • SITE ASSESSMENT • SITE REMEDIATION

5796 U.S. HIGHWAY 64 - 3014
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

October 8, 1992

Mr. Kevin Heaton
Groundwater Management Section
7201 E. 38th St. Space 7253
Tulsa, OK 74145

Dear Mr. Heaton:

Attached are the updated tables containing the information gathered when the Monitor Wells at GCU 181 were developed and sampled.

If you have any questions please contact us.

Respectfully Submitted,
ENVIROTECH, Inc.

Michael K. Lane P.E.
Geological Engineer

C4456CV.LET

SUMMARY OF MONITOR WELL
DEVELOPMENT SCHEDULE & GROUND WATER CONDITIONS
AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT 181
SEC. 34 TWP 29N RNG 12W
SAN JUAN COUNTY, NEW MEXICO
TABLE 2 (1/4)

	Date	Water Level (ft)	Est. Vol. Recovered (gal)	Water Conditions		
				Measured pH	Condtvty. (μS)	Temp. (degree C)
MW-5	8-9-92	5.48	10.0	NR	NR	NR
	8-14-92	5.40	10.0	NR	NR	NR
	8-19-92	5.41	10.0	7.54	6400	21.0
	8-27-92	5.46	9.0	7.80	6700	19.7
	10-2-92	5.35	2.5	7.21	5800	18.9
MW-7	8-9-92	7.2	8.0	NR	NR	NR
	8-12-92	7.0	10.0	NR	NR	NR
	8-19-92	7.3	8.0	7.1	8300	21.1
	8-27-92	7.1	10.0	7.95	9500	21.9
	10-2-92	6.95	3.0	7.62	9100	21.2
MW-10	8-9-92	7.2	8.0	NR	NR	NR
	8-12-92	7.1	8.0	NR	NR	NR
	8-19-92	6.1	8.0	7.4	7500	22.0
	8-27-92	7.01	8.0	7.31	8700	21.9
	10-2-92	6.80	3.0	7.21	8800	21.2
MW-13	8-9-92	7.2	10.0	NR	NR	NR
	8-12-92	6.8	8.0	NR	3600	20.3
	8-20-92	7.0	55.0	7.51	3500	18.8
	10-5-92	7.00	10.0	7.08	3100	18.4

SUMMARY OF MONITOR WELL
DEVELOPMENT SCHEDULE & GROUND WATER CONDITIONS
AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT 181
SEC. 34 TWP 29N RNG 12W
SAN JUAN COUNTY, NEW MEXICO
TABLE 2 (2/4)

	Date	Water Level (ft)	Est. Vol. Recovered (gal)	Water Conditions		
				Measured Ph	Condtvty. (μS)	Temp. (degree C)
MW-15	8-9-92	7.6	9.0	NR	NR	NR
	8-12-92	7.4	10.0	NR	3100	19.0
	8-20-92	7.7	55.0	7.58	2800	18.9
	10-5-92	7.26	10.0	7.24	3300	18.4
MW-17	8-9-92	9.7	10.0	NR	NR	NR
	8-12-92	9.4	10.0	NR	3500	18.4
	8-20-92	9.3	55.0	7.34	3600	19.1
	10-5-92	9.22	8.0	7.08	3600	18.6
MW-21	8-9-92	6.5	4.0	NR	NR	NR
	8-13-92	6.9	5.5	NR	NR	NR
	8-20-92	6.2	5.0	7.20	6000	22.3
	8-27-92	6.04	8.0	7.45	6400	22.7
	10-5-92	5.94	4.0	7.05	5200	20.6
	10-7-92	5.91	5.0	7.08	4600	19.5
MW-25	8-9-92	9.2	10.0	NR	NR	NR
	8-12-92	9.5	10.0	NR	NR	NR
	8-13-92	9.2	10.0	NR	4800	19.0
	8-20-92	9.5	45.0	7.31	5000	19.0
	10-5-92	9.26	8.0	7.16	4800	19.1

SUMMARY OF MONITOR WELL
DEVELOPMENT SCHEDULE & GROUND WATER CONDITIONS
AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT 181
SEC. 34 TWP 29N RNG 12W
SAN JUAN COUNTY, NEW MEXICO
TABLE 2 (3/4)

	Date	Water Level (ft)	Est. Vol. Recovered (gal)	Water Conditions		
				Measured pH	Condtvty. (μS)	Temp. (degree C)
MW-28	8-9-92	6.2	10.0	NR	NR	NR
	8-12-92	7.3	10.0	NR	NR	NR
	8-13-92	7.3	10.0	NR	4000	19.1
	8-22-92	7.28	10.0	7.77	7000	17.5
	10-2-92	7.18	10.0	7.36	3400	19.1
MW-31	8-9-92	4.9	10.0	NR	NR	NR
	8-12-92	6.2	10.0	NR	NR	NR
	8-13-92	5.5	10.0	NR	110300	19.0
	8-22-92	5.63	10.0	7.83	5400	18.5
	10-2-92	5.56	8.0	7.37	10900	19.0
MW-32	8-9-92	7.3	10.0	NR	NR	NR
	8-12-92	8.2	9.0	NR	NR	NR
	8-13-92	7.3	10.0	NR	3200	18.9
	8-27-92	7.17	35.0	7.66	2800	18.7
	10-2-92	7.02	8.0	6.98	3900	20.2
MW-33 (4")	8-9-92	5.6	10.0	NR	NR	NR
	8-13-92	6.6	10.0	NR	NR	NR
	8-19-92	6.8	10.0	NR	4900	20.2
	8-27-92	6.45	10.0	7.20	5900	19.5
	10-1-92	6.33	15.0	7.12	7000	21.7

SUMMARY OF MONITOR WELL
DEVELOPMENT SCHEDULE & GROUND WATER CONDITIONS
AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT 181
SEC. 34 TWP 29N RNG 12W
SAN JUAN COUNTY, NEW MEXICO
TABLE 2 (4/4)

	Date	Water Level (ft)	Est. Vol. Recovered (gal)	Water Conditions		
				Measured pH	Condtvty. (μS)	Temp. (degree C)
MW-34 (4")	8-9-92	5.6	10.0	NR	NR	NR
	8-11-92	6.3	10.0	NR	NR	NR
	8-19-92	7.5	10.0	NR	7300	21.4
	8-27-92	6.4	10.0	7.00	5000	21.3
	10-1-92	6.30	6.0	7.12	7000	21.7
MW-36 (4")	8-9-92	7.0	10.0	NR	NR	NR
	8-11-92	5.5	10.0	NR	NR	NR
	8-19-92	6.0	10.0	NR	8000	20.7
	8-27-92	5.82	10.0	7.59	7000	19.9
	10-1-92	5.70	7.5	7.14	5400	19.3
MW-38 (4")	8-9-92	7.1	10.0	NR	NR	NR
	8-11-92	7.5	10.0	NR	NR	NR
	8-19-92	7.8	10.0	NR	7800	20.2
	8-27-92	7.00	10.0	6.93	5300	21.0
	10-1-92	6.93	7.5	7.19	7400	19.1
	10-5-92	6.88	10.0	7.95	7400	20.9
	10-7-92	6.88	10.0	7.14	7000	19.9

NOTES: 1) WATER LEVEL - Measured from well head to depth below ground surface
2) Est. Vol. - Estimated volume removed by bailling with 0.5 gal bailer and pumping

SUMMARY OF NOTES ON GROUND WATER CONDITIONS
AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT 181
SEC. 34 TWP 29N RNG 12W
SAN JUAN COUNTY, NEW MEXICO
TABLE 3

MONITOR WELL #	DATE	COMMENTS
5	10-2-92	---------- (RB)
7	10-2-92	---------- (RB)
10	10-2-92	---------- (RB)
13	10-5-92	Water was black, contained silt and had strong H_2S smell (ME)
15	10-5-92	Water was black, contained silt and had strong H_2S smell (ME)
17	10-5-92	Water was black, contained silt and had strong H_2S smell (ME)
21	10-5-92	Water was black, had sheen, and contained silt with slight H_2S smell (ME)
25	10-5-92	Water was black, contained silt and had strong H_2S smell (ME)
28	10-2-92	---------- (RB)
31	10-2-92	---------- (RB)
32	10-2-92	---------- (RB)
33	10-1-92	Water was black with slight H_2S smell (RB)
34	10-1-92	Water was black with slight H_2S smell and sheen (RB)
36	10-1-92	---------- (RB)
38	10-1-92	Water was black and contained free product (RB)
	10-5-92	Water was black and had sheen (ME)

RB - Sampled by Ray Benally
ME - Sampled by Mike Eason

DEV.TBL

SUMMARY OF MONITOR WELL GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GALLEGOS CANYON UNIT 181
SEC.34 T29N, R12W, NMPM, SAN JUAN COUNTY, NEW MEXICO

DATE: July 13, 1993 PROJECT NO. 92140/C4456

MW #	SAMPLE TIME	TOTAL DEPTH (ft.)	WATER LEVEL (ft.)	WELL BORE VOLUME (gal.)	WATER CONDITIONS Temp°C	Cond.	pH	DISS. O_2 (mg/L)	COMMENTS
MW25	1421	13.1	9.41	0.61	15.8	2100	7.5	0.0	clear, very little odor
MW28	1426	14.2	7.48	1.12	15.3	1700	7.4	0.0	clear, very little odor
MW31	1439	11.0	5.98	0.83	17.8	6700	7.4	0.1	clear, no odor
MW32	1620	13.3	7.37	0.98	16.6	2400	7.5	0.1	clear, very little odor, duplicate taken
MW33	1524	13.4	6.73	4.44	17.3	1700	7.7	0.0	light sheen
MW38	1550	14.3	7.38	4.61	17.0	7500	7.3	0.0	yellow product, bad odor, light sheen
MW34	1519	12.0	7.07	3.29	18.2	3800	7.0	0.0	yellow product, strong odor, light sheen
MW-5	1552	14.8	5.86	1.48	20.0	4900	7.3	0.1	no product or odor
MW36	1541	13.6	6.12	1.24	17.0	3200	7.5	0.0	murky, no odor, duplicate taken
MW-7	1600	11.4	7.40	0.66	15.6	8000	7.4	0.1	clear, some odor, light sheen
MW10	1606	12.2	7.40	0.80	16.2	6900	7.3	0.0	light gray color, some odor
MW13	1403	12.6	7.10	0.91	16.5	1900	7.6	0.0	light gray color, very light odor
MW15	1347	13.9	7.80	1.01	16.9	1300	7.4	0.0	clear, no odor
MW17	1350	14.8	9.60	0.86	14.9	1600	7.5	0.0	clear, no odor
MW21	1359	9.9	6.20	0.61	17.8	2300	7.4	0.0	light gray color, some odor

SUMMARY OF MONITOR WELL GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GCU COM I 181
(F) SEC.34 T29N, R12W, NMPM, SAN JUAN COUNTY, NEW MEXICO

DATE: July 27, 1993

PROJECT NO. 92140/C4456

MW #	SAMPLE TIME	TOTAL DEPTH (ft.)	WATER LEVEL (ft.)	WELL BORE VOLUME (gal.)	WATER CONDITIONS Temp°C	Cond.	pH	DISS. O_2 (mg/L)	COMMENTS
MW25	1225	13.1	9.54	0.59	16.5	4700	7.5	0.0	BLACK TO MURKY, SLIGHT ODOR
MW28	1203	14.2	7.57	1.11	18.1	3700	7.2	0.0	BLACK TO MURKY, SLIGHT ODOR, DUPLICATE TAKEN
MW31	1145	11.0	6.06	0.82	18.6	12900	7.6	0.0	MURKY, NO ODOR
MW32	1115	13.3	7.46	0.97	16.4	3500	7.2	0.0	BALCK COLOR, STRONG ODOR
MW33	1020	13.4	6.84	2.14	18.6	4200	7.5	0.0	BLACK TO MURKY, STRONG ODOR
MW38	0850	14.3	7.50	2.22	18.7	10700	7.1	0.0	YELLOW PRODUCT, STRONG ODOR, LIGHT SHEEN
MW34	1000	12.0	6.82	1.69	20.5	8300	7.0	0.0	DARKISH GREEN PRODUCT, STRONG ODOR, LIGHT SHEEN
MW-5	0925	14.8	5.93	1.48	19.5	6500	7.5	0.0	MURKY, NO ODOR
MW36	0940	13.6	6.23	1.23	18.7	6600	7.4	0.0	MURKY, NO ODOR, DUPLICATE TAKEN
MW-7	1030	11.4	7.50	0.65	18.8	11200	7.4	0.0	BLACK COLOR, STRONG ODOR
MW10	1050	12.2	7.52	0.78	20.1	10300	7.3	0.0	BLACK COLOR, STRONG ODOR
MW13	1305	12.6	7.12	0.91	18.1	3700	7.4	0.0	MURKY, SLIGHT ODOR
MW15	1315	13.9	7.61	1.05	18.0	4000	7.7	0.0	LIGHT GRAY COLOR, STRONG ODOR
MW17	1335	14.8	9.64	0.86	16.7	3200	7.4	0.0	MURKY, SLIGHT ODOR
MW21	1250	9.9	6.28	0.60	19.8	5000	7.3	0.0	BLACK COLOR, STRONG ODOR

SUMMARY OF MONITOR WELL GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
GCU COM I 181
(F) SEC.34 T29N, R12W, NMPM, SAN JUAN COUNTY, NEW MEXICO

DATE: July 27, 1993

PROJECT NO. 92140/C4456

MW #	SAMPLE TIME	TOTAL DEPTH (ft.)	WATER LEVEL (ft.)	WELL BORE VOLUME (gal.)	WATER CONDITIONS Temp°C	Cond.	pH	DISS. O_2 (mg/L)	COMMENTS
MW25	1225	13.1	9.54	0.59	16.5	4700	7.5	0.0	BLACK TO MURKY, SLIGHT ODOR
MW28	1203	14.2	7.57	1.11	18.1	3700	7.2	0.0	BLACK TO MURKY, SLIGHT ODOR, DUPLICATE TAKEN
MW31	1145	11.0	6.06	0.82	18.6	12900	7.6	0.0	MURKY, NO ODOR
MW32	1115	13.3	7.46	0.97	16.4	3500	7.2	0.0	BALCK COLOR, STRONG ODOR
MW33	1020	13.4	6.84	2.14	18.6	4200	7.5	0.0	BLACK TO MURKY, STRONG ODOR
MW38	0850	14.3	7.50	2.22	18.7	10700	7.1	0.0	YELLOW PRODUCT, STRONG ODOR, LIGHT SHEEN
MW34	1000	12.0	6.82	1.69	20.5	8300	7.0	0.0	DARKISH GREEN PRODUCT, STRONG ODOR, LIGHT SHEEN
MW-5	0925	14.8	5.93	1.48	19.5	6500	7.5	0.0	MURKY, NO ODOR
MW36	0940	13.6	6.23	1.23	18.7	6600	7.4	0.0	MURKY, NO ODOR, DUPLICATE TAKEN
MW-7	1030	11.4	7.50	0.65	18.8	11200	7.4	0.0	BLACK COLOR, STRONG ODOR
MW10	1050	12.2	7.52	0.78	20.1	10300	7.3	0.0	BLACK COLOR, STRONG ODOR
MW13	1305	12.6	7.12	0.91	18.1	3700	7.4	0.0	MURKY, SLIGHT ODOR
MW15	1315	13.9	7.61	1.05	18.0	4000	7.7	0.0	LIGHT GRAY COLOR, STRONG ODOR
MW17	1335	14.8	9.64	0.86	16.7	3200	7.4	0.0	MURKY, SLIGHT ODOR
MW21	1250	9.9	6.28	0.60	19.8	5000	7.3	0.0	BLACK COLOR, STRONG ODOR

GCU #181

Summary of GMS Laboratory Analyses

Total BTEX (ppm)

	(Open Pit) 8/4/92	9/8	10/8	1/5/93	4/15	7/13	7/27						
	~~JAN~~	~~FEB~~	~~MAR~~	APR	~~MAY~~	~~JUN~~	~~JUL~~	AUG	SEP	OCT	NOV	DEC	TOTAL
Upper Pond (South)	.026	.021	.049	–	0.117	–							
Lower Pond (North)	.048	.042	.028	–	0.065	–							
MW-5	ND	.019	ND	ND	ND	ND	ND						
MW-7	–	9.23	–	13.4	3.31	11.7	2.79						
MW-10	–	7.01	5.48	3.27	2.34	2.36	1.45						
MW-13	17.6	.054	.031	.036	.005	.034	.001						
MW-15	.001	.006	.002	ND	.005	ND	.001						
MW-17	ND	ND	ND	ND	ND	ND	.001						
MW-21	162.	4.02	2.16	.686	.043	.346	.073						
MW-25	ND	ND	ND	ND	ND	ND	.001						
MW-28	328.	.092	.109	.118	.039	.022	.004 .004						
MW-31	ND	ND	ND	ND	ND	ND	ND				1		
MW-32	832.	.318	.521	.251	.382	.072 .028	.048						
MW-33 (4")	290.	2.31	1.82	.101	.0060	.152	.003						
MW-34 (4")	906.	30.4	11.6	"Product"	12.9	32.2	11.5						
MW-36	.043	.013	.009	.006	.004	.009 .009	ND ND						
MW-38 (4")	–	39.1	8.04	"Product"	11.8	11.7	8.83						

Buddy,

Attached find results for water samples from the test pits. These results are for dissolved BTEX only; TPH results will be available later this week. These results should be regarded as preliminary indicators only, given the rather crude method of sample collection. Monitoring well samples will be much more representative, and will be collected in 2 weeks.

No real surprises from the dissolved BTEX data. Unfortunately, no firm conclusions regarding the source can be drawn from the data thus far. GC signatures for most of the water samples were similar, or at least were not significantly different to identify separate source areas. Test pit 29 did have a distinctive GC signature, however, similar to a heavy diesel or light fuel oil range material.

Product samples from the GCU#181 production tank, and upstream/downstream wells along the pipeline (GCU#202/GCU#170E), DO have distinctively separate GC signatures. Unlike the 202 and 170E, the GCU 181 distinctively lacks the heavier ends (C16-C30) of the crude/condensate. This might be due to sampling location. As you know, El Paso collected samples from the 202 and 170E, and I'm not certain exactly where on these sites they were collected (ie tank ? line ?)

I will be out of the office 8/18 through 8/20. We can discuss further on Friday, 8/21. Contact Gary Barker at x4428 if you need assistance in my absence.

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: APC Gallegos Canyon Unit, Com "1" #181, San Juan Co., NM

Lab#: 92W0995-6 Method: Amoco Modified 8015

Date sampled: 08/06/92 Date received: 08/10/92

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL
Trip blank	ND	ND	ND	ND	ND
Pit#2	7.32	74.1	39.8	395.	516.
Pit#5	ND	ND	ND	ND	ND
Pit#12	ND	ND	ND	ND	ND
Pit#13	0.656	2.05	2.48	12.4	17.6
Pit#14	0.058	0.022	0.188	0.057	0.320
Pit#15	ND	0.001	ND	ND	0.001
Pit#16	ND	ND	ND	ND	ND
Pit#17	ND	ND	ND	ND	ND
Pit#18	ND	ND	ND	ND	ND
Pit#19	ND	ND	ND	ND	ND
Pit#20	1.18	0.011	0.262	0.457	1.91
Pit#21	2.97	14.1	21.3	124.	162.
Pit#22	ND	ND	ND	ND	ND
Pit#23	ND	ND	ND	ND	ND
Pit#24	ND	ND	ND	ND	ND
Pit#25	ND	ND	ND	ND	ND
Pit#26	ND	ND	ND	ND	ND
Pit#27	ND	ND	ND	ND	ND

Pit#28	2.38	73.8	22.3	230.	328.
Pit#29	ND	ND	ND	ND	ND
Pit#30	ND	ND	ND	ND	ND
Pit#31	ND	ND	ND	ND	ND
Pit#32	29.6	202.	69.3	531.	832.
Pit#33	6.37	56.6	28.4	199.	290.
Pit#34	20.7	240.	46.1	599.	906.
Pit#36	ND	0.001	0.009	0.033	0.043
Pit#37	ND	ND	ND	ND	ND
Low Ditch SW	ND	0.006	0.010	0.032	0.048
Up. Ditch SW	0.004	0.008	0.002	0.012	0.026

NOTES
1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes,
4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.

Comments:

Sampled by: APC - K. P. Heaton & G. Barker

Date analyzed: 08/11/92 Checked by: T. G. Miller

KPH:kph
92230ART0365

August 17, 1992

Injection Report

Acquired on 12-AUG-1992 at 21:39

AMOCO, Groundwater Management Section

Analyst Name : ZSTN01
Lims Id : 08/12/92
Comment :
Method Title : Method for Product Characterization
Sample Name : GCU#181, San Juan Co, NM GCU#170E DwnSt
Sample Id : 92P0199B
Sample Type : Sample Amount=1.00000
Bottle No : 8

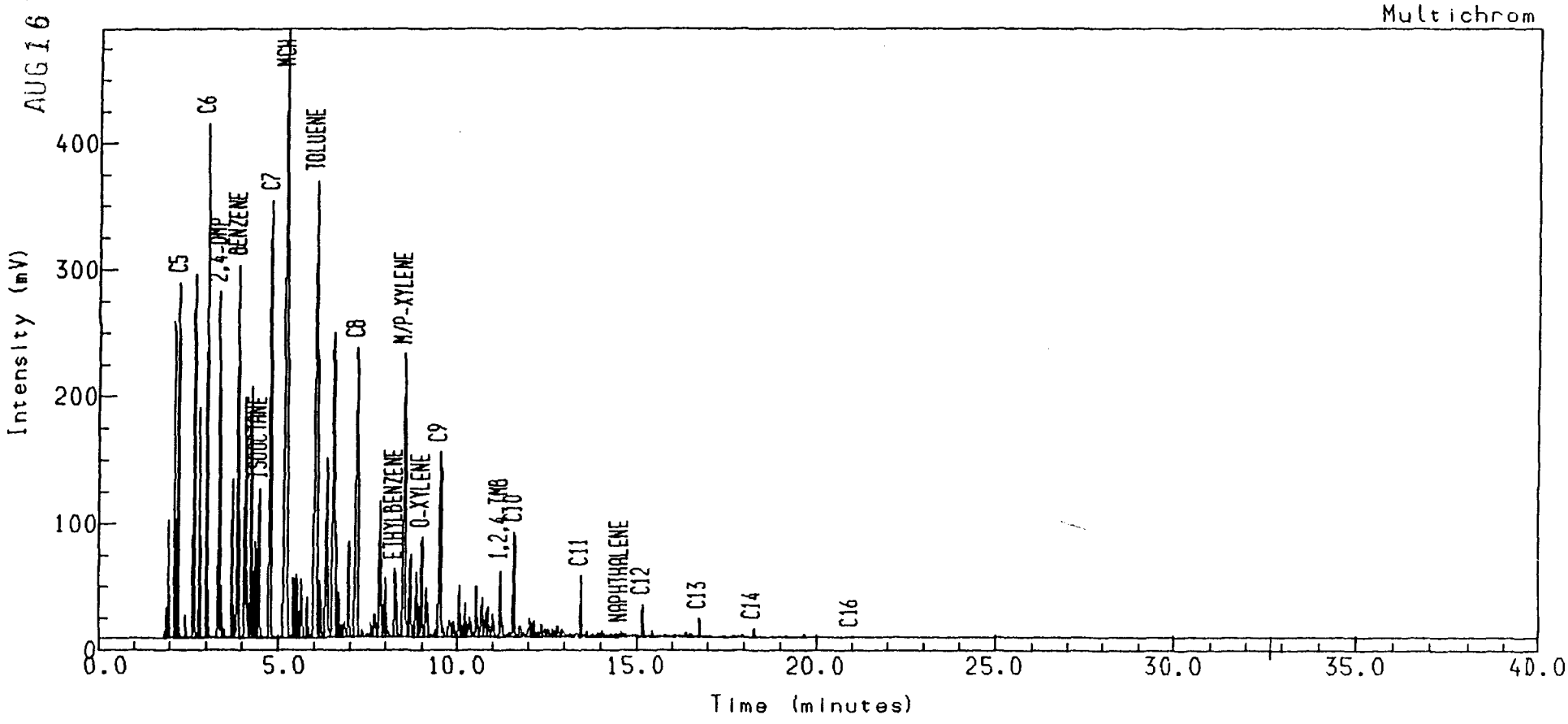
PEAK INFORMATION

RT mins	Area uVs	Per cent	Peak name	Width
2.240	532575	3.2	C5	1.6A
3.044	864657	5.2	C6	1.9
3.387	566586	3.4	2,4-DMP	2.1
3.930	634608	3.8	BENZENE	2.4
4.484	216923	1.3	ISOOCTANE	2.4
4.813	943131	5.7	C7	3.5
5.244	1666434	10.0	MCH	4.3
6.044	754249	4.5	TOLUENE	3.5
7.187	675113	4.1	C8	4.3
8.262	130873	0.8	ETHYLBENZENE	3.7
8.507	602647	3.6	M/P-XYLENE	3.7
8.991	149388	0.9	O-XYLENE	2.4
9.502	394088	2.4	C9	3.2
11.196	165793	1.0	1,2,4-TMB	2.7
11.582	213027	1.3	C10	2.7
13.453	122096	0.7	C11	2.4
14.569	15833	9.5E-2	NAPHTHALENE	2.7
15.178	92906	0.6	C12	2.4
16.778	87231	0.5	C13	2.4
18.276	75988	0.5	C14	2.4
21.018	54124	0.3	C16	2.7
22.280	48486	0.3	C17	2.7
23.476	42295	0.3	C18	2.4
24.622	44134	0.3	C19	2.9
25.711	31492	0.2	C20	2.7
26.751	27565	0.2	C21	2.7
27.747	25865	0.2	C22	2.7
28.707	23346	0.1	C23	2.9
29.622	22195	0.1	C24	2.9
30.507	20731	0.1	C25	2.7
31.360	16675	0.1	C26	2.9
32.182	11566	7.0E-2	C27	2.9
32.991	9660	5.8E-2	C28	2.9
33.818	7085	4.3E-2	C29	3.2

AMOCO, Groundwater Management Section

Analysis Name : [GMS] 15 92PRDT0812,7,1.

GCU#181, San Juan Co, NM GCU#181 Amount : 1.000



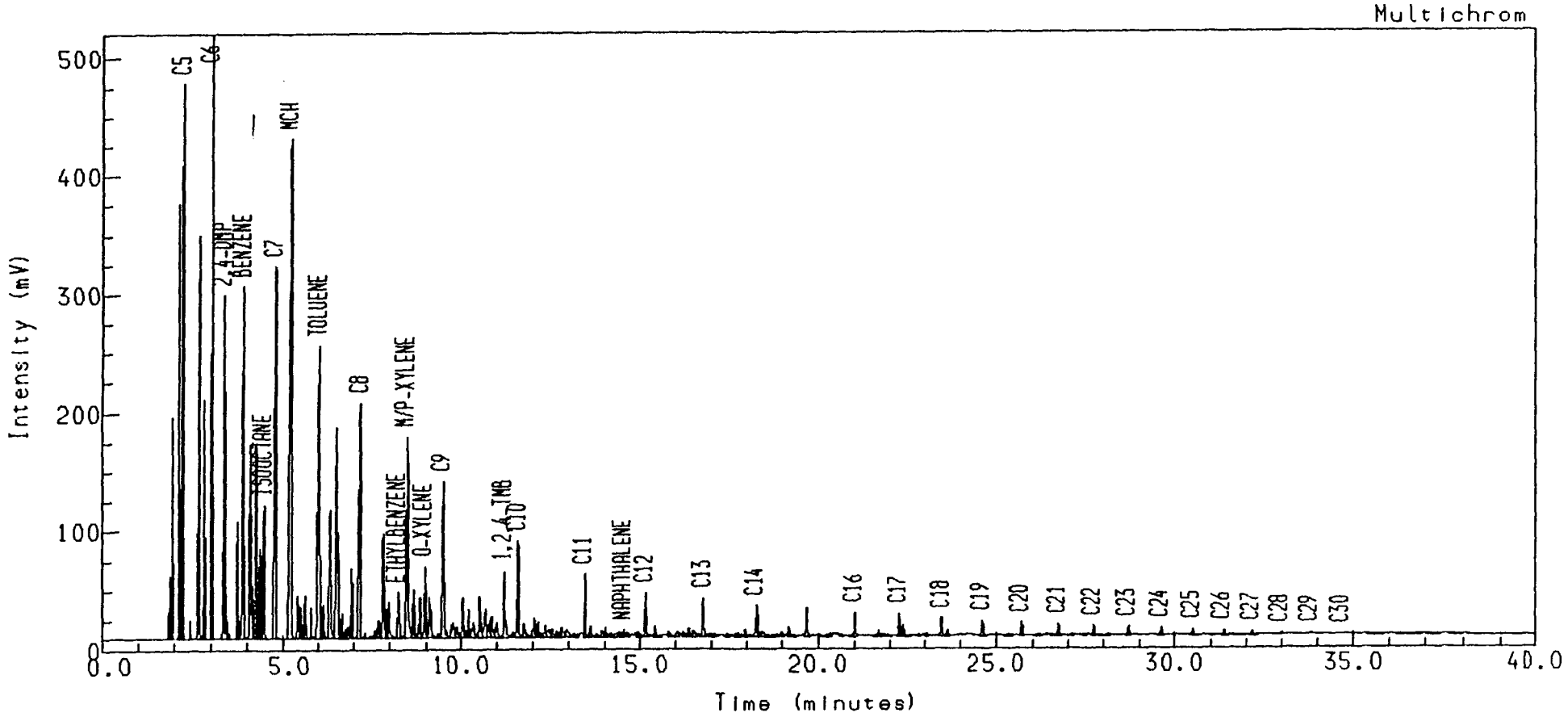
Instrument : HP5790GC
Channel Title : Channel #15
Lims ID : 92P0199A
Acquired on 12-AUG-1992 at 20:26
Reported on 12-AUG-1992 at 21:11

Method : PRODUCT
Calibration : PRODUCT
Run Sequence : PRDT0812

AMOCO, Groundwater Management Section

Analysis Name : [GMS] 15 92PRDT0812,8,1.

GCU#181, San Juan Co, NM GCU#170E DwnSt Amount : 1.000



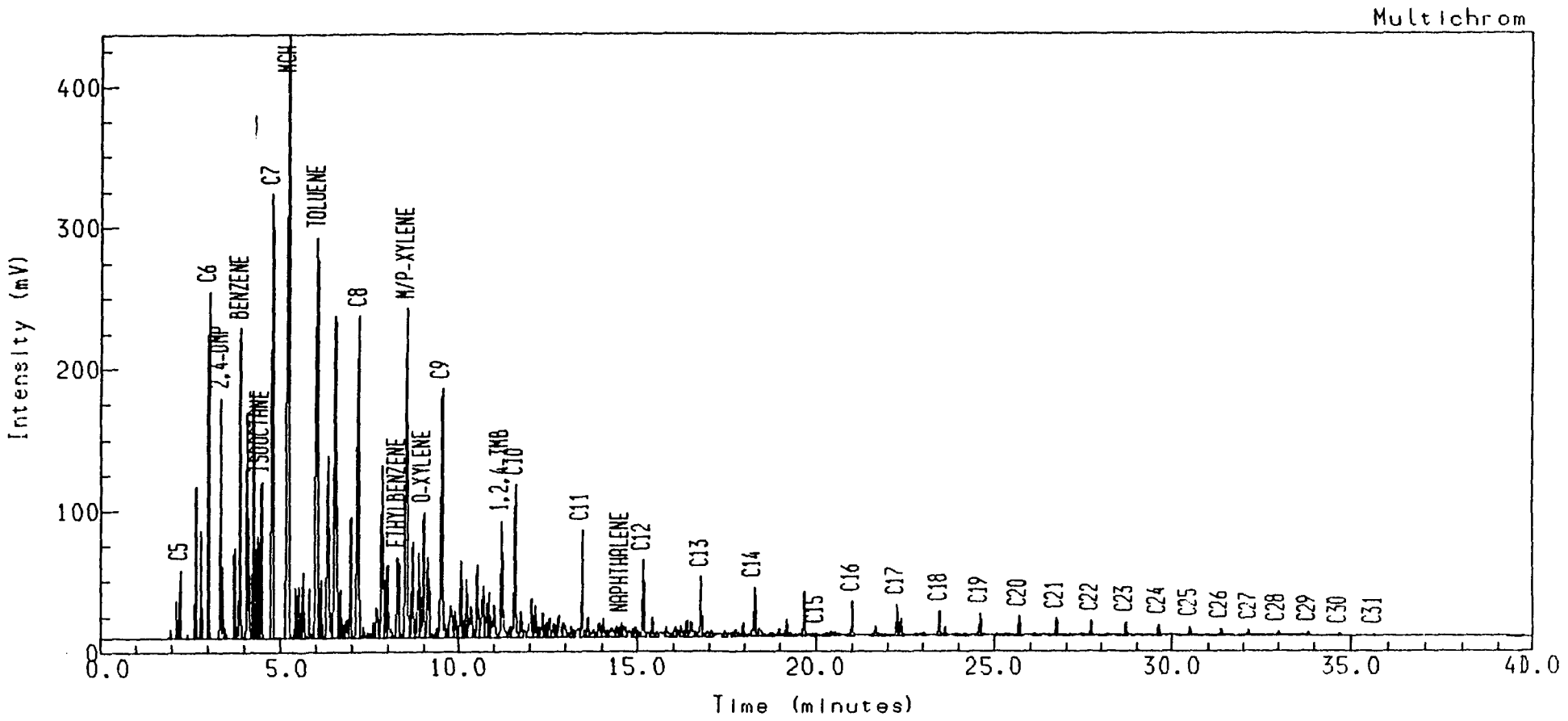
Instrument : HP5790GC
Channel Title : Channel #15
Lims ID : 92P0199B
Acquired on 12-AUG-1992 at 21:39
Reported on 12-AUG-1992 at 22:19

Method : PRODUCT
Calibration : PRODUCT
Run Sequence : PRDT0812

AMOCO, Groundwater Management Section

Analysis Name : [GMS] 15 92PRDT0812,9,1.

GCU#181, San Juan Co, NM GCU#202 Upstrm Amount : 1.000



Instrument : HP5790GC
Channel Title : Channel #15
Lims ID : 92P0199C
Acquired on 12-AUG-1992 at 22:50
Reported on 12-AUG-1992 at 23:31

Method : PRODUCT
Calibration : PRODUCT
Run Sequence : PRDT0812

CONFIRMED/FINAL Analytical Results for Dissolved Hydrocarbons
Amoco GCU#181, San Juan Basin, New Mexico
Sampled 9/4/92

Buddy:

Attached are results showing dissolved BTEX and TPH. These results are substantially different than the original pit samples, and are generally much lower by orders of magnitude. We are double checking for potential laboratory error for either sample set, but it is unlikely. I will confirm one way or another.

Please advise if you desire a formal transmittal letter on our letterhead, including chain of custody, etc.

Regards,

Kevin Heaton

BUDDY:

WE HAVE CONFIRMED THAT THESE RESULTS ARE ACCURATE FROM A LABORATORY STANDPOINT. THE DISCREPANCY FROM THE ORIGINAL PIT SAMPLES IS VERY UNUSUAL AND SOMEWHAT DIFFICULT TO EXPLAIN. I WOULD RECOMMEND RE-SAMPLING ALL THE WELLS AT THE 181 BEFORE WE PROCEED WITH ANY REMEDIAL DECISIONS, PRIMARILY TO CONFIRM THESE RESULTS ONE WAY OR ANOTHER. I WILL NOT BE ABLE TO DO THIS NEXT WEEK DUE TO TIME CONSTRAINTS. AT LEAST 3-5 WELL VOLUMES SHOULD BE REMOVED FROM EACH WELL PRIOR TO SAMPLING, AND THIS CAN BE VERY TIME CONSUMING (ESP. ON 4" WELLS!).

I'D RECOMMEND HAVING ENVIROTECH DO THE WORK. SHOULD TAKE ABOUT 1-2 DAYS FOR 1 PERSON TO PROPERLY GAUGE, PURGE, AND SAMPLE ALL 15 WELLS. HAVE THEM CONTACT ME FOR INSTRUCTIONS AND FREON, IF YOU AGREE.

KEVIN HEATON

KPH:kph
92273ART0108

September 29, 1992

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: Gallegos Canyon Unit#181, Sec.24-T29N-R12W, San Juan Basin, NM

Lab#: 92W1133 Method: Amoco Modified 8015

Date sampled: 09/04/92 Date received: 09/08/92

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL
Eqpmnt blank	ND	ND	ND	0.001	0.001
Upper Pond	0.002	0.007	0.002	0.010	0.021
Lower Pond	0.002	0.006	0.008	0.026	0.042
MW-5	ND	0.015	ND	0.004	0.019
MW-7	0.200	0.729	1.70	6.60	9.23
MW-10	0.021	0.072	0.510	6.41	7.01
MW-13	0.004	0.020	0.012	0.018	0.054
MW-15	ND	0.003	0.003	ND	0.006
MW-17	ND	ND	ND	ND	ND
MW-21	0.027	0.023	0.640	3.33	4.02
MW-25	ND	ND	ND	ND	ND
MW-28	0.014	0.033	0.018	0.027	0.092
MW-31	ND	ND	ND	ND	ND
MW-32	0.006	0.011	0.024	0.277	0.318
MW-33	0.011	0.022	0.322	1.95	2.31
MW-34	0.415	0.430	0.681	28.9	30.4

KPH:kph
92273ART0108

September 29, 1992

MW-36	ND	0.002	0.003	0.008	0.013
MW-38	0.564	1.14	1.04	36.4	39.1

NOTES
1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes,
4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.

Comments:

Sampled by: Amoco GMS - K. P. Heaton

Date analyzed: 09/10/92 Checked by: T. G. Miller

KPH:kph
92273ART0108

September 29, 1992

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR TOTAL PETROLEUM HYDROCARBONS

Location: Gallegos Canyon Unit#181, Sec.24-T29N-R12W, San Juan Basin, NM

Lab#: 92W1133 Method: Amoco Modified 8015

Date sampled: 09/08/92 Date received: 09/08/92

Sample ID	Volatiles	Semi-Volatiles
Eqpmnt blank	ND	ND
Upper Pond	ND	ND
Lower Pond	ND	ND
MW-5	ND	ND
MW-7	92	25
MW-10	15	ND
MW-13	1	ND
MW-15	ND	ND
MW-17	ND	ND
MW-21	8	ND
MW-25	ND	ND
MW-28	3	ND
MW-31	ND	ND
MW-32	1	ND
MW-33	8	ND
MW-34	98	44
MW-36	ND	ND

KPH:kph
92273ART0108

September 29, 1992

MW-38 208 29

NOTES
1. ND = Not Detected at or above reporting limit.
2. The reporting limit for TPH by GC is 1 mg/L for volatiles and 5 mg/L for semi-volatiles.

Comments:

Date analyzed: 09/10/92 Checked by: T. G. Miller

KPH:kph
92273ART0108

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: GCU #181 (APC), Farmington, NM

Lab#: 92W1273 Method: Amoco Modified 8015

Date sampled: 10/1,5,7/92 Date received: 10/08/92

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL	9/8/92
Travel blank1	ND	ND	ND	0.001	0.001	
Travel blank2	ND	ND	ND	ND	ND	
Drainage D-N	ND	0.001	0.006	0.021	0.028	.042
Drainage D-S	0.029	0.005	0.005	0.010	0.049	.021
MW-5	ND	ND	ND	ND	ND	.019
MW-10	ND	0.330	0.809	4.34	5.48	7.01
MW-13	0.006	0.007	0.006	0.012	0.031	.054
MW-15	ND	0.002	ND	ND	0.002	.006
MW-17	ND	ND	ND	ND	ND	ND
MW-21	0.038	0.106	0.540	1.48	2.16	4.02
MW-21 Dup.	0.038	0.099	0.505	1.40	2.03	
MW-25	ND	ND	ND	ND	ND	ND
MW-28	ND	0.034	0.010	0.065	0.109	.092
MW-31	ND	ND	ND	ND	ND	ND
MW-32	0.050	0.109	0.047	0.315	0.521	.318
MW-33	ND	0.135	0.346	1.34	1.82	2.31
MW-34	0.351	0.395	0.546	10.3	11.6	30.4
MW-36	ND	0.001	0.003	0.005	0.009	.013

MW-38	0.621	0.254	0.407	6.76	8.04	39.1
MW-38 B	0.571	0.124	0.287	9.16	10.1	

NOTES
1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes,
4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.

Comments: Sample MW-7 was not received. Two samples labeled MW-38 were received, but collected on different dates and by different collectors.

Sampled by: Envirotech - Tommy Covington & Mike Eason

Date analyzed: 10/12/92 Checked by: T. G. Miller

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR TOTAL PETROLEUM HYDROCARBONS

Location: GCU #181 (APC), Farmington, NM

Lab#: 92W1273 Method: Amoco Modified 8015

Date sampled: 10/1-7/92 Date received: 10/08/92

Sample ID	Volatiles	Semi-Volatiles
Travel blank1	ND	ND
Travel blank2	ND	ND
Drainage D-N	ND	ND
Drainage D-S	ND	ND
MW-5	ND	ND
MW-10	46	8
MW-13	ND	ND
MW-15	ND	ND
MW-17	ND	ND
MW-21	17	ND
MW-21 Dup.	17	ND
MW-25	ND	ND
MW-28	2	ND
MW-31	ND	ND
MW-32	3	ND
MW-33	20	ND
MW-34	80	19
MW-36	ND	ND
MW-38	61	11

MW-38 B 35 5

NOTES
1. ND = Not Detected at or above reporting limit.
2. The reporting limit for TPH by GC is 1 mg/L for volatiles and 5 mg/L for semi-volatiles.

Comments:

Date analyzed: 10/12/92 Checked by: T. G. Miller

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY
FLUID AND SOIL SAMPLE TRANSMITTAL FORM

SEND SAMPLES TO:

GROUNDWATER MANAGEMENT LABORATORY
7201 E. 38th ST., SPACE 7253
TULSA, OK 74145

PHONE: (918) 660-4420 FAX: (918) 660-4443

FROM:

(Please Print) _____ AMOCO OPERATING COMPANY

_____ AMOCO MARKETING DISTRICT OFFICE (IF APPLICABLE)

_____ AMOCO REPRESENTATIVE AUTHORIZING WORK

ENVIROTECH, INC CONSULTING FIRM

MICHAEL K. LANE (505) 632-0615
CONSULTING FIRM - PROJECT MANAGER TEL #

5796 USHWY 64-3014 STREET ADDRESS / MAILING ADDRESS

FARMINGTON NM 87401
CITY STATE ZIP

RESULTS TO: ☒ AMOCO ☐ CONSULTANT ☐ OTHER (PROVIDE INFO BELOW)

NAME KEVIN P. HEATON

ADDRESS ENVIRONMENTAL AFFAIRS & SAFETY
GROUNDWATER MANAGEMENT SECTION
7201 EAST 38TH ST, SPACE 7253
TULSA, OK 74145
CITY STATE ZIP

LOCATION SAMPLED: Gallegos Canyon Unit # 181 (APC) (Use AMOCO Facility Numbers When Known)

FACILITY NAME GCU 181 AMOCO FACILITY # _____

ADDRESS STREET _____ CITY FARMINGTON STATE NM

RESULTS REQUESTED:

GROUNDWATER:	SOIL:	PRODUCT:
X BTEX	____ BTEX	PRODUCT
____ MTBE	____ MTBE	____ CHARACTERIZATION
X TPH	____ TPH	____ LEAD CONTENT
____ OTHER		

DATE RESULTS REQUIRED: _____

☐ INDICATE HERE IF *DRINKING WATER SAMPLES*

NUMBER OF SAMPLES SHIPPED: 15

COLLECTED FROM:

X OBSERVATION WELL	____ DISCHARGE POINT	DATE COLLECTED 10-1 / 10-2 / 10-5-92 / 10-7-92
____ RECOVERY WELL	____ WATER TAP	BY TOMMY COVINGTON / MIKE EASON
____ WATER WELL	____ STREAM	
____ TEST BORING	____ TANK	DATE SHIPPED _____
____ SEPARATOR	____ PIT	BY M2E
____ OTHER _____		VIA _____

REASON FOR SAMPLING OR ADDITIONAL INFORMATION & REMARKS: _____

SHIPPED BY: Michael D. Eason (SIGNATURE) 10-7-92 (DATE)

RECEIVED BY: _____ (SIGNATURE) _____ (DATE)

PLEASE ATTACH COMPLETED ORIGINAL 'CHAIN OF CUSTODY' FORM
OR

GROUNDWATER MANAGEMENT SECTION

AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY

CHAIN OF CUSTODY RECORD

PAGE _____ OF _____

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME GCU 181 AMOCO FACILITY # _____

ADDRESS STREET _____ CITY FARMINGTON STATE NM

SAMPLER MICHAEL T. MASON AFFILIATION ENVIROTECH, INC

SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE (SOIL, WATER, PRODUCT)	PRESERVATION METHOD (FREON, ICE PACKS, NONE)	SAMPLE CONTAINER DESCRIPTION	NUMBER OF VIALS	ANALYSES REQUESTED
MW # 25	10-5-92	0945	WATER	FREON	40ml VOC	1	BTEX + TPH
MW # 13	10-5-92	1045	WATER	FREON	40ml VOC	1	BTEX + TPH
DRAINAGE DITCH - N. SIDE	10-5-92	1120	WATER	FREON	40ml VOC	1	BTEX + TPH
MW #15	10-5-92	1146	WATER	FREON	40ml VOC	1	BTEX + TPH
MW #17	10-5-92	1300	WATER	FREON	40ml VOC	1	BTEX + TPH
DRAINAGE DITCH - S. SIDE	10-5-92	1425	WATER	FREON	40ml VOC	1	BTEX + TPH
MW #38	10-7-92	1430	WATER	FREON	40ml VOC	1	BTEX + TPH
MW #21	10-7-92	1510	WATER	FREON	40ml VOC	2	BTEX + TPH
TRAVEL BLANK #1	10-5-92	-	-	FREON	2ml VIAL	1	
TRAVEL BLANK #2	10-7-92	-	-	FREON	2ml VIAL	1	
MW # 8							
						1	

REMARKS:

1. RELINQUISHED BY:	1. DATE	1. RECEIVED BY:	3. RELINQUISHED BY:	3. DATE	3. RECEIVED BY:
Michael T. Mason	10-7-92				
2. RELINQUISHED BY:	2. DATE	2. RECEIVED BY:	4. RELINQUISHED BY:	4. DATE	4. RECEIVED BY:

GROUNDWATER MANAGEMENT SECTION

AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY

CHAIN OF CUSTODY RECORD

PAGE _____ OF _____

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME GCU 181 AMOCO FACILITY # _____

ADDRESS STREET _____ CITY FARMINGTON STATE NM

SAMPLER TOMMY COVINGTON / RAY BENALLY AFFILIATION ENVIROTECH, INC

SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE (SOIL, WATER, PRODUCT)	PRESERVATION METHOD (FREON, ICE PACK#, NONE)	SAMPLE CONTAINER DESCRIPTION	NUMBER OF VIALS	ANALYSES REQUESTED
MW #33	10-1-92	1125	WATER	FREON	40ml VOL	1	BTEX + TPH
MW # 34	10-1-92	1325	WATER	FREON	40ml VOL	1	BTEX + TPH
MW #36	10-1-92	1430	WATER	FREON	40ml VOL	1	BTEX + TPH
MW #5	10-2-92	1130	WATER	FREON	40ml VOL	1	BTEX + TPH
MW #7 None	10-2-92	1330	WATER	FREON	40ml VOL	1	BTEX + TPH
MW # 10	10-2-92	1405	WATER	FREON	40ml VOL	1	BTEX + TPH
MW # 32	10-2-92	1430	WATER	FREON	40ml VOL	1	BTEX + TPH
MW # 31	10-2-92	1445	WATER	FREON	40ml VOL	1	BTEX + TPH
MW # 28	10-2-92	1315	WATER	FREON	40ml VOL	1	BTEX + TPH

OPQAFNML

REMARKS: MW # 7 not sent; [illegible]

1. RELINQUISHED BY:	1. DATE	1. RECEIVED BY:	3. RELINQUISHED BY:	3. DATE	3. RECEIVED BY:
Tommy Covington	10-7-92			10-8-92	[signature]
2. RELINQUISHED BY:	2. DATE	2. RECEIVED BY:	4. RELINQUISHED BY:	4. DATE	4. RECEIVED BY:

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: Gallegos Canyon Unit 181, Farmington, NM

Lab#: 93W0015 Method: Amoco Modified 8015

Date sampled: 01/05/93 Date received: 01/07/93

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL
Trip blank	ND	ND	ND	ND	ND
MW-5	ND	ND	ND	ND	ND
MW-7	ND	ND	1.90	11.5	13.4
MW-10	ND	ND	0.393	2.88	3.27
MW-13	ND	ND	0.006	0.024	0.030
MW-15	ND	ND	ND	ND	ND
MW-17	ND	ND	ND	ND	ND
MW-21	0.031	ND	0.194	0.461	0.686
MW-25	ND	ND	ND	ND	ND
MW-28	ND	ND	0.014	0.091	0.105
MW-28 Dup.	ND	ND	0.017	0.101	0.118
MW-31	ND	ND	ND	ND	ND
MW-32	0.023	0.088	0.021	0.119	0.251
MW-33	ND	ND	0.021	0.080	0.101
MW-36	ND	ND	0.003	0.003	0.006

NOTES

1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes,
4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.

Comments:

Sampled by: Envirotech - Tom Coddington

Date analyzed: 01/10/93 Checked by: T. G. Miller

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: Gallegos Canyon Unit 181, Farmington, NM

Lab#: 93W0455 Method: Amoco Modified 8015

Date sampled: 04/15/93 Date received: 04/19/93

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL
Trip blank	ND	ND	ND	ND	ND
North pond	0.008	0.019	0.021	0.069	0.117
South pond	0.009	0.020	0.004	0.032	0.065
MW #5	ND	ND	ND	ND	ND
MW #7	0.009	ND	0.628	2.67	3.31
MW #10	0.005	ND	0.447	1.89	2.34
MW #13	ND	ND	0.002	0.003	0.005
MW #13 Dup.	ND	ND	0.003	0.002	0.005
MW #15	ND	ND	ND	ND	ND
MW #17	ND	ND	ND	ND	ND
MW #21	0.023	ND	0.004	0.016	0.043
MW #25	ND	ND	ND	ND	ND
MW #28	ND	ND	0.013	0.026	0.039
MW #31	ND	ND	ND	ND	ND
MW #32	0.030	0.127	0.032	0.193	0.382
MW #33	0.023	ND	0.014	0.023	0.060
MW #34	0.596	ND	0.229	12.1	12.9
MW #36	ND	ND	0.002	0.002	0.004
MW #38	0.595	ND	0.211	11.0	11.8

NOTES

1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes,
4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.

Comments:

Sampled by: EnviroTech - Jim Weahkee

Date analyzed: 04/22/93 Checked by: T. G. Miller

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR PETROLEUM HYDROCARBONS IN WATER

Location: Gallegos Canyon Unit 181, Farmington, NM

Lab#: 93W0455 Method: Amoco Modified 8015

Date sampled: 04/15/93 Date received: 04/19/93

Sample ID	Volatiles	Semi-Volatiles
Trip blank	ND	ND
North pond	ND	ND
South pond	ND	ND
MW #5	ND	ND
MW #7	12	3
MW #10	6	1
MW #13	ND	ND
MW #13 Dup.	ND	ND
MW #15	ND	ND
MW #17	ND	ND
MW #21	1	ND
MW #25	ND	ND
MW #28	ND	ND
MW #31	ND	ND
MW #32	ND	ND
MW #33	1	ND
MW #34	30	9
MW #36	ND	ND
MW #38	18	2

NOTES

1. Unit of data is mg/L.
2. ND = Not Detected at or above reporting limit.
3. The reporting limit for TPH by GC is 1 mg/L for volatiles and 1 mg/L for semi-volatiles.

Comments:

Date analyzed: 04/22/93 Checked by: T. G. Miller

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY
FLUID AND SOIL SAMPLE TRANSMITTAL FORM

SEND SAMPLES TO:

GROUNDWATER MANAGEMENT LABORATORY
7201 E. 38th ST., SPACE 7253
TULSA, OK 74145

PHONE: (918) 660-4420 FAX: (918) 660-4443

RESULTS TO:
- [X] AMOCO
- [ ] CONSULTANT
- [ ] OTHER (PROVIDE INFO BELOW)

NAME ~~KEVIN HEATON~~ Dennis B.
ADDRESS ENVIRONMENTAL AFFAIRS & SAFETY
7201 EAST 38TH. STREET SPACE 7253
TULSA, OKLAHOMA 74145-3207
CITY STATE ZIP

FROM:
(Please Print)
AMOCO OPERATING COMPANY
AMOCO MARKETING DISTRICT OFFICE (IF APPLICABLE)
BUDDY SHAW
AMOCO REPRESENTATIVE AUTHORIZING WORK
ENVIROTECH INC.
CONSULTING FIRM
JIM WEAHKEE (505) 632-0615
CONSULTING FIRM - PROJECT MANAGER TEL #
5796 U.S. HIGHWAY 64-3014
STREET ADDRESS / MAILING ADDRESS
FARMINGTON NEW MEXICO 87401
CITY STATE ZIP

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)
FACILITY NAME GALLEGOS CANYON UNIT # 181 AMOCO FACILITY #
ADDRESS STREET CITY FARMINGTON STATE NM

RESULTS REQUESTED:

GROUNDWATER:	SOIL:	PRODUCT:
X BTEX	____ BTEX	PRODUCT
____ MTBE	____ MTBE	____ CHARACTERIZATION
X TPH	____ TPH	____ LEAD CONTENT
____ OTHER 8015		

DATE RESULTS REQUIRED:
ASAP

- [ ] INDICATE HERE IF ***DRINKING WATER SAMPLES***

NUMBER OF SAMPLES SHIPPED: 19

COLLECTED FROM:

____ OBSERVATION WELL	____ DISCHARGE POINT	DATE COLLECTED 4-15-93
____ RECOVERY WELL	____ WATER TAP	BY JIM WEAHKEE
____ WATER WELL	____ STREAM	
X TEST BORING	____ TANK	DATE SHIPPED 4-16-93
____ SEPARATOR	____ PIT	BY JIM WEAHKEE
____ OTHER ____		VIA UPS

REASON FOR SAMPLING OR ADDITIONAL INFORMATION & REMARKS:

SHIPPED BY: _____ SIGNATURE _____ DATE

RECEIVED BY: _____ SIGNATURE _____ DATE

PLEASE ATTACH COMPLETED ORIGINAL 'CHAIN OF CUSTODY' FORM
OR
COMPLETE FORM ON REVERSE SIDE

(FORM 3672 Jul-91)

GROUNDWATER MANAGEMENT SECTION

AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY

CHAIN OF CUSTODY RECORD

PAGE _____ OF _____

W0455

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME Gallegos Canyon Unit 181 AMOCO FACILITY # _____

ADDRESS STREET _____ CITY Farmington STATE N.Mex

SAMPLER Jim Weahkee AFFILIATION Envirotech Inc.

SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE (SOIL, WATER, PRODUCT)	PRESERVATION METHOD (FREON, ICE PACKS, NONE)	SAMPLE CONTAINER DESCRIPTION	NUMBER OF VIALS	ANALYSES REQUESTED
MW #10	4-15-93	1543	WATER	FREON	40 MIL VIAL	1	BTEX-8015
MW #31	4-15-93	1441	WATER	FREON	40 MIL VIAL	1	BTEX-8015
South Pond	4-15-93	1600	WATER	FREON	40 MIL VIAL	1	BTEX-8015
MW #28	4-15-93	1425	WATER	FREON	40 MIL VIAL	1	BTEX-8015
MW #5	4-15-93	1531	WATER	FREON	40 MIL VIAL	1	BTEX-8015
MW #34	4-15-93	1518	WATER	FREON	40 MIL VIAL	1	BTEX-8015
MW #7	4-15-93	1536	WATER	FREON	40 MIL VIAL	1	BTEX-8015
MW #25	4-15-93	1410	WATER	FREON	40 MIL VIAL	1	BTEX-8015
MW #36	4-15-93	1526	WATER	FREON	40 MIL VIAL	1	BTEX-8015
MW #17	4-15-93	1635	WATER	FREON	40 MIL VIAL	1	BTEX-8015
MW #15	4-15-93	1627	WATER	FREON	40 MIL VIAL	1	BTEX-8015
MW #33	4-15-93	1512	WATER	FREON	40 MIL VIAL	1	BTEX-8015
MW #38	4-15-93	1547	WATER	FREON	40 MIL VIAL	1	BTEX-8015
MW #32	4-15-93	1455	WATER	FREON	40 MIL VIAL	1	BTEX-8015
MW #21	4-15-93	1620	WATER	FREON	40 MIL VIAL	1	BTEX-8015
North Pond	4-15-93	1625	WATER	FREON	40 MIL VIAL	1	BTEX-8015
MW #13	4-15-93	1610	WATER	FREON	40 MIL VIAL	2	BTEX-8015
REMARKS: Trip Blank	4-15-93	—	—	FREON	2 MIL VIAL	1	

1. RELINQUISHED BY:	1. DATE	1. RECEIVED BY:	3. RELINQUISHED BY:	3. DATE	3. RECEIVED BY:
Jeff Gould	4-16-93			4-16-93	
2. RELINQUISHED BY:	2. DATE	2. RECEIVED BY:	4. RELINQUISHED BY:	4. DATE	4. RECEIVED BY:

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: Gallegos Canyon Unit, San Juan County, New Mexico

Lab#: 93W1064 Method: Amoco Modified 8015

Date sampled: 07/13/93 Date received: 07/15/93

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL
Trip blank	ND	ND	ND	ND	ND
MW #5	ND	ND	ND	ND	ND
MW #7	ND	0.722	2.29	8.71	11.7
MW #10	ND	0.067	0.646	1.65	2.36
MW #13	ND	0.004	0.006	0.024	0.034
MW #15	ND	ND	ND	ND	ND
MW #17	ND	ND	ND	ND	ND
MW #21	0.026	0.056	0.037	0.227	0.346
MW #25	ND	ND	ND	ND	ND
MW #28	ND	ND	0.007	0.015	0.022
MW #31	ND	ND	ND	ND	ND
MW #32	0.011	0.004	0.017	0.040	0.072
MW #32 Dup.	0.005	0.001	0.007	0.015	0.028
MW #33	ND	0.047	0.034	0.071	0.152
MW #34	0.594	0.604	0.296	30.7	32.2
MW #36	ND	ND	0.004	0.005	0.009
MW #36 Dup.	ND	ND	0.004	0.005	0.009
MW #38	0.392	0.080	0.236	11.0	11.7

NOTES

1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes,
4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.

Comments:

Sampled by: EnviroTech - J. Blagg

Date analyzed: 07/23/93 Checked by: T. G. Miller

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY
FLUID AND SOIL SAMPLE TRANSMITTAL FORM

SEND SAMPLES TO:

GROUNDWATER MANAGEMENT LABORATORY
7201 E. 38th ST., SPACE 7253
TULSA, OK 74145

PHONE: (918) 660-4420 FAX: (918) 660-4443

FROM: (Please Print)

AMOCO OPERATING COMPANY

AMOCO MARKETING DISTRICT OFFICE (IF APPLICABLE)

BUDDY SHAW
AMOCO REPRESENTATIVE AUTHORIZING WORK

ENVIROTECH, INC.
CONSULTING FIRM

MYKE LANE (505)632-0615
CONSULTING FIRM - PROJECT MANAGER TEL #

5796 U.S. HWY 64 - 3014
STREET ADDRESS / MAILING ADDRESS

FARMINGTON, NM 87401
CITY STATE ZIP

RESULTS TO:
- [x] AMOCO
- [ ] CONSULTANT
- [ ] OTHER (PROVIDE INFO BELOW)

NAME BUDDY SHAW

ADDRESS 200 Amoco Ct.

FARMINGTON, NM 87401
CITY STATE ZIP

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME Gcu Com I 181 AMOCO FACILITY #

ADDRESS STREET CITY STATE

RESULTS REQUESTED:

GROUNDWATER:	SOIL:	PRODUCT:
✓ BTEX	BTEX	PRODUCT
MTBE	MTBE	CHARACTERIZATION
TPH	TPH	LEAD CONTENT
OTHER		

DATE RESULTS REQUIRED:

☐ INDICATE HERE IF ***DRINKING WATER SAMPLES***

NUMBER OF SAMPLES SHIPPED: 17 SAMPLE VIALS + 1 TRIP BLANK VIAL

COLLECTED FROM:

✓ OBSERVATION WELL	DISCHARGE POINT	DATE COLLECTED 7/13/93
RECOVERY WELL	WATER TAP	BY JCR
WATER WELL	STREAM	
TEST BORING	TANK	DATE SHIPPED 7/14/93
SEPARATOR	PIT	BY UPS
OTHER		VIA NEXT DAY AIR

REASON FOR SAMPLING OR ADDITIONAL INFORMATION & REMARKS: GROUNDWATER MONITOR WELLS SAMPLED AT THE REQUEST OF AMOCO.

SHIPPED BY: Jeff Blagg (SIGNATURE) 7-14-93 (DATE)

RECEIVED BY: (SIGNATURE) (DATE)

PLEASE ATTACH COMPLETED ORIGINAL 'CHAIN OF CUSTODY' FORM OR

(FORM 2672 [illegible])

GROUNDWATER MANAGEMENT SECTION

AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY

CHAIN OF CUSTODY RECORD

W10164

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME GCU com I 181 AMOCO FACILITY #

~~ADDRESS~~ ~~STREET~~ SAN JUAN COUNTY ~~CITY~~ STATE NEW MEXICO

SAMPLER JEFF BLAGG AFFILIATION ENVIROTECH [CONSULTANT]

SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE (SOIL, WATER, PRODUCT)	PRESERVATION METHOD (FREON, ICE PACKS, NONE)	SAMPLE CONTAINER DESCRIPTION	NUMBER OF VIALS	ANALYSES REQUESTED
B MW # 5	7-13-93	1552	WATER	FREON	40 ML VIAL	1	BTEX BY AMOCO MODIFIED 8015
C MW # 7	7-13-93	1600	"	"	"	1	" "
D MW # 10	7-13-93	1606	"	"	"	1	" "
E MW # 13	7-13-93	1403	"	"	"	1	" "
F MW # 15	7-13-93	1347	"	"	"	1	" "
G MW # 17	7-13-93	1350	"	"	"	1	" "
H MW # 21	7-13-93	1359	"	"	"	1	" "
I MW # 25	7-13-93	1421	"	"	"	1	" "
J MW # 28	7-13-93	1426	"	"	"	1	" "
K MW # 31	7-13-93	1439	"	"	"	1	" "
KL MW # 32	7-13-93	1620	"	"	"	2	" "
M MW # 33	7-13-93	1524	"	"	"	1	" "
N MW # 34	7-13-93	1519	"	"	"	1	" "
O MW # ~~38~~ 36	7-13-93	1541	"	"	"	2	" "
P MW # 38	7-13-93	1550	"	"	"	1	" "
A TRIP BLANK					2 ML VIAL	1	

REMARKS:

1. RELINQUISHED BY:	1. DATE	1. RECEIVED BY:	3. RELINQUISHED BY:	3. DATE	3. RECEIVED BY:
Jeff Blagg	7-14-93			7/15/93	A Romero
2. RELINQUISHED BY:	2. DATE	2. RECEIVED BY:	4. RELINQUISHED BY:	4. DATE	4. RECEIVED BY:

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: Amoco GCU Com I 181, Farmington, NM

Lab#: 93W1139 Method: Amoco Modified 8015

Date sampled: 07/28/93 Date received: 07/28/93

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL
Trip blank	ND	0.001	ND	ND	0.001
MW #5	ND	ND	ND	ND	ND
MW #7	0.062	0.065	0.681	1.98	2.79
MW #10	0.003	0.015	0.354	1.08	1.45
MW #13	ND	0.001	ND	ND	0.001
MW #15	ND	0.001	ND	ND	0.001
MW #17	ND	0.001	ND	ND	0.001
MW #21	0.024	0.007	ND	0.042	0.073
MW #25	ND	0.001	ND	ND	0.001
MW #28	ND	0.001	ND	0.003	0.004
MW #28 Dup.	ND	0.001	ND	0.003	0.004
MW #31	ND	ND	ND	ND	ND
MW #32	0.009	0.001	0.009	0.029	0.048
MW #33	ND	0.001	ND	0.002	0.003
MW #34	0.511	0.010	0.257	10.7	11.5
MW #36	ND	ND	ND	ND	ND
MW #36 Dup.	ND	ND	ND	ND	ND
MW #38	0.334	0.014	0.160	8.32	8.83

NOTES

1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes,
4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.

Comments:

Sampled by: Envirotech - Nelson Velez

Date analyzed: 08/02/93 Checked by: T. G. Miller

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY
FLUID AND SOIL SAMPLE TRANSMITTAL FORM

SEND SAMPLES TO:

GROUNDWATER MANAGEMENT LABORATORY
7201 E. 38th ST., SPACE 7263
TULSA, OK 74145

PHONE: (918) 660-4420 FAX: (918) 660-4443

FROM:

(Please Print) _____
AMOCO OPERATING COMPANY

_____
AMOCO MARKETING DISTRICT OFFICE (IF APPLICABLE)

_____
AMOCO REPRESENTATIVE AUTHORIZING WORK

ENVIROTECH, INC.
CONSULTING FIRM

MYKE LANE (505) 632-0615
CONSULTING FIRM - PROJECT MANAGER TEL

5796 U.S. HWY 64-3014
STREET ADDRESS / MAILING ADDRESS

FARMINGTON N.M. 87401
CITY STATE ZIP

RESULTS TO: ☒ AMOCO ☐ CONSULTANT ☐ OTHER (PROVIDE INFO BELOW)

NAME Buddy SHAW

ADDRESS 200 Amoco COURT

FARMINGTON N.M. 87401
CITY STATE ZIP

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME GCU com I 181 AMOCO FACILITY # _____

ADDRESS STREET _____ CITY _____ STATE _____

RESULTS REQUESTED:

GROUNDWATER:	SOIL:	PRODUCT:
X BTEX	____ BTEX	PRODUCT
____ MTBE	____ MTBE	____ CHARACTERIZATION
____ TPH	____ TPH	____ LEAD CONTENT
____ OTHER		

DATE RESULTS REQUIRED: _____

☐ INDICATE HERE IF *DRINKING WATER SAMPLES*

NUMBER OF SAMPLES SHIPPED: 18 (INCLUDING TRIP BLANK)

COLLECTED FROM:

X OBSERVATION WELL	____ DISCHARGE POINT
____ RECOVERY WELL	____ WATER TAP
____ WATER WELL	____ STREAM
____ TEST BORING	____ TANK
____ SEPARATOR	____ PIT
____ OTHER _____	

DATE COLLECTED 7/27/93
BY NELSON VELEZ

DATE SHIPPED 7/27/93
BY UPS
VIA NEXT DAY AIR

REASON FOR SAMPLING OR ADDITIONAL INFORMATION & REMARKS: _____

SHIPPED BY: Nelson Velez 7/27/93
SIGNATURE DATE

RECEIVED BY: _____ _____
SIGNATURE DATE

PLEASE ATTACH COMPLETED ORIGINAL 'CHAIN OF CUSTODY' FORM
OR

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY
CHAIN OF CUSTODY RECORD

W1139

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME Gcu com I 181 AMOCO FACILITY # _____

ADDRESS STREET _____ CITY _____ STATE _____

SAMPLER Nelson Velez AFFILIATION Envirotech, Inc.

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE (SOIL, WATER, PRODUCT)	PRESERVATION METHOD (FREON, ICE PACKS, NONE)	SAMPLE CONTAINER DESCRIPTION	NUMBER OF VIALS	ANALYSES REQUESTED
P	MW #38	7/27/93	0850	WATER	FREON	40 mL VOA VIAL	1	BTEX MODIFIED 8015
B	MW # 5	7/27/93	0925	"	"	" " " "	1	BTEX " "
01 02	MW # 36	7/27/93	0940	"	"	" " " "	2	BTEX " "
N	MW #34	7/27/93	1000	"	"	" " " "	1	BTEX " "
M	MW #33	7/27/93	1020	"	"	" " " "	1	BTEX " "
C	MW # 7	7/27/93	1030	"	"	" " " "	1	BTEX " "
D	MW #10	7/27/93	1050	"	"	" " " "	1	BTEX " "
L	MW #32	7/27/93	1115	"	"	" " " "	1	BTEX " "
K	MW #31	7/27/93	1145	"	"	" " " "	1	BTEX " "
J 03	MW #28	7/27/93	1203	"	"	" " " "	2	BTEX " "
I	MW #25	7/27/93	1225	"	"	" " " "	1	BTEX " "
H	MW #21	7/27/93	1250	"	"	" " " "	1	BTEX " "
E	MW #13	7/27/93	1305	"	"	" " " "	1	BTEX " "
F	MW #15	7/27/93	1315	"	"	" " " "	1	BTEX " "
G	MW #17	7/27/93	1335	"	"	" " " "	1	BTEX " "
A	TRIP BLANK	7/27/93	—	FREON	NONE	2 mL VOA VIAL	1	BTEX " "

REMARKS:

1. RELINQUISHED BY:	1. DATE	1. RECEIVED BY:	3. RELINQUISHED BY:	3. DATE	3. RECEIVED BY:
Nelson Velez	7/27/93 1430			7/28/93	
2. RELINQUISHED BY:	2. DATE	2. RECEIVED BY:	4. RELINQUISHED BY:	4. DATE	4. RECEIVED BY

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: GCU Com F 162, Farmington, NM

Lab#: 93W1149 Method: Amoco Modified 8015

Date sampled: 07/29/93 Date received: 07/30/93

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL
Trip blank	ND	ND	ND	ND	ND
MW #3	0.002	0.001	ND	ND	0.003
MW #3 Dup.	0.002	ND	ND	ND	0.002
MW #4	0.347	0.005	0.069	0.651	1.07
MW #5	ND	ND	ND	ND	ND
MW #6	0.039	0.006	0.019	0.230	0.294
MW #9	ND	ND	ND	ND	ND
MW #10	ND	ND	ND	ND	ND

NOTES
1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes,
4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.

Comments:

Sampled by: EnviroTech - Nelson Velez

Date analyzed: 08/03/93 Checked by: T. G. Miller

GROUNDWATER MANAGEMENT SECTION
AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY
FLUID AND SOIL SAMPLE TRANSMITTAL FORM

SEND SAMPLES TO:

GROUNDWATER MANAGEMENT LABORATORY
7201 E. 38th ST., SPACE 7253
TULSA, OK 74145

PHONE: (918) 660-4420 FAX: (918) 660-4443

RESULTS TO: ☒ AMOCO ☐ CONSULTANT ☐ OTHER (PROVIDE INFO BELOW)

NAME Buddy Shaw
ADDRESS 200 Amoco Court
FARMINGTON, NM 87401
CITY STATE ZIP

FROM:

(Please Print)
AMOCO OPERATING COMPANY
AMOCO MARKETING DISTRICT OFFICE (IF APPLICABLE)
AMOCO REPRESENTATIVE AUTHORIZING WORK
ENVIROTECH, INC.
CONSULTING FIRM
MYKE LANE (505) 632-0615
CONSULTING FIRM - PROJECT MANAGER TEL #
5796 U.S. HWY 64-3014
STREET ADDRESS / MAILING ADDRESS
FARMINGTON, NM 87401
CITY STATE ZIP

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME Gcu com F 162 AMOCO FACILITY #
ADDRESS STREET CITY STATE

RESULTS REQUESTED:

GROUNDWATER:	SOIL:	PRODUCT:
X BTEX	BTEX	PRODUCT
MTBE	MTBE	CHARACTERIZATION
TPH	TPH	LEAD CONTENT
OTHER		

DATE RESULTS REQUIRED:

☐ INDICATE HERE IF *DRINKING WATER SAMPLES*

NUMBER OF SAMPLES SHIPPED: 8 (INCLUDING TRIP BLANK)

COLLECTED FROM:

X OBSERVATION WELL	DISCHARGE POINT	
RECOVERY WELL	WATER TAP	
WATER WELL	STREAM	
TEST BORING	TANK	
SEPARATOR	PIT	
OTHER		

DATE COLLECTED 7/29/93
BY Nelson Velez
DATE SHIPPED 7/29/93
BY UPS
VIA NEXT DAY AIR

REASON FOR SAMPLING OR ADDITIONAL INFORMATION & REMARKS: PER REQUEST BY BUDDY SHAW - Amoco PRODUCTION CORPORATION

SHIPPED BY: Nelson Velez (SIGNATURE) 7/29/93 (DATE)

RECEIVED BY: (SIGNATURE) (DATE)

PLEASE ATTACH COMPLETED ORIGINAL 'CHAIN OF CUSTODY' FORM

GROUNDWATER MANAGEMENT SECTION

AMOCO CORPORATION - ENVIRONMENTAL AFFAIRS AND SAFETY

CHAIN OF CUSTODY RECORD

W1149

LOCATION SAMPLED: (Use AMOCO Facility Numbers When Known)

FACILITY NAME Gcu com F 162 AMOCO FACILITY #

ADDRESS STREET CITY STATE

SAMPLER Nelson Velez AFFILIATION ENVIROTECH, INC.

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE (SOIL, WATER, PRODUCT)	PRESERVATION METHOD (FREON, ICE PACKS, NONE)	SAMPLE CONTAINER DESCRIPTION	NUMBER OF VIALS	ANALYSES REQUESTE
D	MW # 5	7/29/93	0900	WATER	FREON	40 mL VOA VIAL	1	BTEX MODIFIED 801
E	MW # 6	7/29/93	0918	"	"	" " " "	1	BTEX " "
C	MW # 4	7/29/93	0930	"	"	" " " "	1	BTEX " "
B1 B2	MW # 3	7/29/93	0947	"	"	" " " "	2	BTEX " "
F	MW # 9	7/29/93	1005	"	"	" " " "	1	BTEX " "
G	MW # 10	7/29/93	1025	"	"	" " " "	1	BTEX " "
A	TRIP BLANK	7/29/93	—	FREON	NONE	2 mL VOA VIAL	1	BTEX " "

REMARKS:

1. RELINQUISHED BY:	1. DATE	1. RECEIVED BY:	3. RELINQUISHED BY:	3. DATE	3. RECEIVED BY:
Nelson Velez	7/29/93 1130			7/30/93	
2. RELINQUISHED BY	2. DATE	2. RECEIVED BY:	4. RELINQUISHED BY:	4. DATE	4. RECEIVED BY