GW - ____28____

MONITORING REPORTS

DATE:

WELL LOG INFORMATION

WELL LOGGING FORM

Client NAVAJO REFINERY Well Number MW- 8

___1/4___1/4___1/4___1/4 S___T___R___ State NEW MEXICO

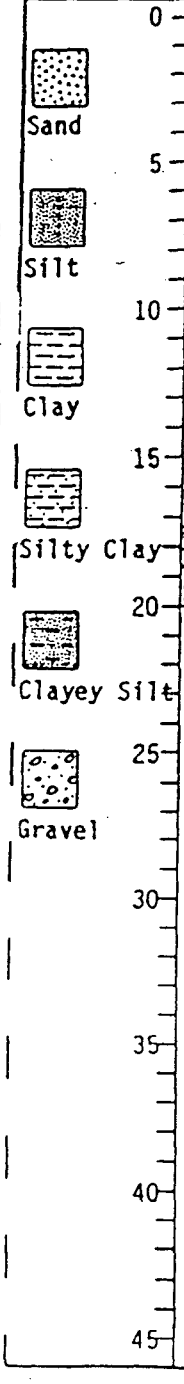
County EDDY Contractor LARRY'S DRILLING

Spud Date 6-20-86 Completion Date 6-20-86

Logs Run LITHOLOGY Logged By SELKE

Elevation _____ Spud In (Fm.) _____

Remarks Steam cleaned rig and tools prior to drilling - drilled with air rotary



RUN	FROM	TO	SAMPLE DEPTH	REMARKS
				0-8' Brown, silty sandy clay moist at approx. 8'
				8-13' white to gray, sandy clay with modera amounts of gravel(pea size)
				13-20' lt. brown clayey sand (abund. clay) v. minor gravel at top w/ moderate to abundant gravel at bottom

WELL LOGGING FORM

Client NAVAJO REFINERY Well Number MW- 9

__1/4__1/4__1/4__1/4 S__T__R__ State NEW MEXICO

County EDDY Contractor LARRY'S DRILLING

Spud Date 6-20-86 Completion Date 6-20-86

Logs Run LITHOLOGY Logged By SELKE

Elevation _____ Spud In (Fm.) _____

Remarks Steam cleaned rig and tools prior to drilling- drilled with air rotary- no temporary casing

DEPTH	LITHO.	RECOV.	RUN	FROM	TO	SAMPLE DEPTH	REMARKS
0 Sand							0-approx. 5' brown, silty , sandy clay
5 Silt							approx. 5'-approx. 15' white to gray, sandy clay
10 Clay							
15 ilty Clay							15-20' lt. brown, clayey sand w/ moderate amounts of fine grain gravel
20 Clayey Silt							
25 ravel							
30							
35							
40							
45							

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

FIELD ENGR. LOG

Section 1. GENERAL INFORMATION

(A) Owner of well NAVAJO REFINING COMPANY Owner's Well No. 18

Street or Post Office Address Box 159

City and State Artesia, N M 88210

Well was drilled under Permit No. RA 6969 and is located in the: Observation/Monitor well

a. NW ¼ SW ¼ NW ¼ ¼ of Section 9 Township 17S Range 26 E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Hughes Drilling Company License No. WD 749

Address Box 199A, Route 1, Artesia, N M 88210

Drilling Began 6/8/82 Completed 6/8/82 Type tools Air rotary Size of hole 7- 7/8 in.

Elevation of land surface or casing at well is 3364 ft. Total depth of well 19 ft.

Completed well is [X] shallow [ ] artesian. Depth to water upon completion of well 10 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
16	19	3	fine anhydritic sand and red shale	NA

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
6	PVC				20		15	19

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
0	12			3	hand

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received June 22, 1982

Quad ____ ____ FWL ____ FSL ____

File No. A-6969 Use Obs./Mo. ring Location No. 17.26.9.13111

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	2	2	Red soil
2	8	6	gyp (weathered anhy) with red shale
8	14	6	gyp white and anhydritic sand
14	19	5	Fine red shale and anhyritic sand - water @ 16'

Section 7. REMARKS AND ADDITIONAL INFORMATION

observation/monitoring well

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above-described hole.

Dale Hughes
Driller

INSTRUCTIO' his form should be executed in triplicate, preferably typ en, and submitted to the appropriate district office

Samp. Meth.	Samp. Log	PID (ppm)	Depth (Feet)
RB			1–24

Geologic Description

0–1' SILTY SAND, brown, moist, medium to fine grained, many roots.

1–8.5' CLAYEY SAND, brown, changing to tan near 4', moist, friable, many roots and root channels, clay content increasing with depth.

8.5–13' CLAY, brown, moist, plastic, some gray mottling, gypsum crystals noted.

13–14' CLAYEY SAND, tan, moist, friable.

14–14.5' SAND with silt, tan, saturated, fine to medium grain.

14.5–20' CLAY, with gravel, clay is reddish/brown, very moist, plastic; gravel is < 1" dia. and saturated.

20–20.5 CLAYEY SAND, gray, saturated, some gravel fragments.

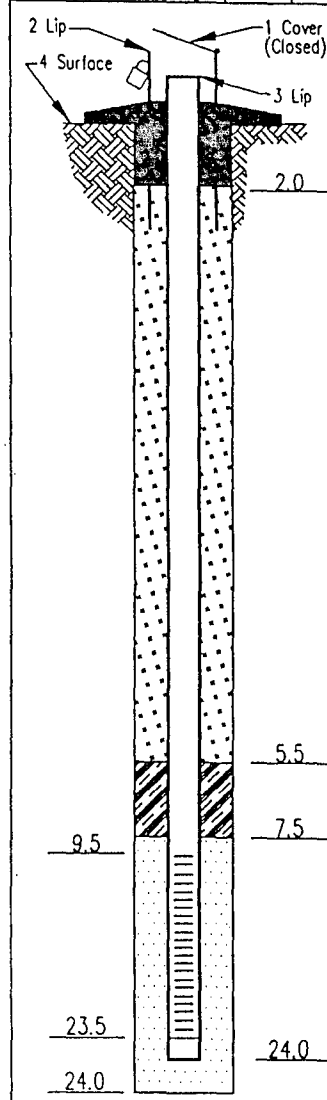
20.5–24' CLAY, reddish/brown, moist, plastic, blocky.
- thin zone of gravel near 23' is saturated (<4").

TD = 24'

Sample Method Symbols

RB=Recovery Barrel ☒ 5' ☐ ____ | ST=Shelby Tube | SS=Split Spoon | C=Cutting

Monitoring Well	X
Piezometer	
Protective Casing	YES



Depths in Feet from Ground Surface (Not to Scale)

LOG-1

Design Specifications

Elevations: (feet MSL) 1 3340.69 2 3340.67 3 3340.00 4 3337.20

Coordinates: X 5606.12 Y 2420.80

Bore Hole Diameter: 12"

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ ____

Casing Diameter: ☐ 2" ☒ 4" ☐ 6" ☐ ____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ ____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ____

Sand Pack: C.S.S.I. 20/40

Bentonite Seal: ☐ 1/4" Pellets ☒ 1/2" Pellets ☐ 1/2" Chips ☐ Hole Plug ☐ ____

Grout Type: Portland/Bentonite Weight: ____

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ ____

Drilled By: Pool Environmental Lic. #: WD 1266

Logged By: PWC

Completion Date: 01/21/93

Depth First Encountered Water: 14.0' BLS

Date	D-T-W	D-T-P	Prod Thick	Field pH	Field EC
1/26/93	10.18			6.93	7,600
2/10/93	10.41				

Comments: ____

KWBES

MW-20

Project: 622092005-110 (MW-20)
Location: Artesia, New Mexico

Samp. Meth.	Samp. Log	PID (ppm)	Depth (Feet)
RB			2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

Geologic Description

0-3.0' CLAYEY SAND, light brown, fine grained, white (carbonate nodules throughout, hard, dry, earthy odor.

3.0-7.5' SANDY CLAY, dark brown, color change to light gray at 6.0', fine grained sand, rust staining (dendritic) throughout, some clear crystals (gypsum?), soft, moist, earthy odor.

7.5-10.5' CALICHE (carbonate) GRAVEL, light gray, some clay throughout, hard, saturated at 10.0', no odor.

10.5-12.0' SANDY CLAY, light gray, fine grained sand, moist, no odor.

12.0-13.0' CALICHE (carbonate) GRAVEL, light gray, some clay throughout, hard, saturated, no odor.

13.0-23.0' CALICHE (carbonate) GRAVEL, reddish/brown, some clay throughout, hard, saturated at 13.0-13.5', 14.5-15.5', and 19.0-19.5', no odor.

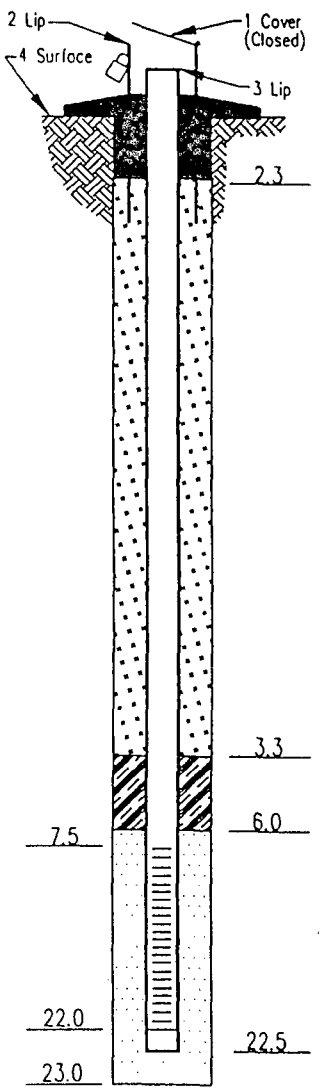
TD = 23.0'

Sample Method Symbols

RB=Recovery Barrel ☒ 5' ☐ ____

ST=Shelby Tube | SS=Split Spoon | C=Cutting

Monitoring Well	X
Piezometer	
Protective Casing	YES



Depths in Feet from Ground Surface (Not to Scale)

LOG-1

Design Specifications

Elevations: (feet MSL) 1 3336.39 2 3336.37 3 3336.18 4 3333.50

Coordinates: X 6925.27 Y 1807.82

Bore Hole Diameter: 12"

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ ____

Casing Diameter: ☐ 2" ☒ 4" ☐ 6" ☐ ____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ ____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ____

Sand Pack: Colorado Silica 20-40

Bentonite Seal: ☐ 1/4" Pellets ☒ 1/2" Pellets ☐ 1/2" Chips ☐ Hole Plug ☐ ____

Grout Type: None Weight: ____

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ ____

Drilled By: Precision Engineering Lic. #: ____

Logged By: WCZ

Completion Date: 1/23/93

Depth First Encountered Water: 10.0' BLS

Date	D-T-W	D-T-P	Prod Thick	Field pH	Field EC
1/27/93	10.65			6.85	5,200
2/10/93	10.92				

Comments: Replacement well between MW-8 and MW-9.

KWBES

MW-21

Project: 622092005-110 (MW-21)
Location: Artesia, New Mexico

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

FIELD ENGR. LOG ✓

Section 1. GENERAL INFORMATION

(A) Owner of well NAVAJO REFINING COMPANY Owner's Well No. 23

Street or Post Office Address Drawer 159

City and State Artesia, N M 88210

Well was drilled under Permit No. RA 6975 X and is located in the:

a. NE ¼ NW ¼ NW ¼ SW ¼ of Section 9 Township 17 S Range 26 E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor S. Dale Hughes License No. WD 749

Address Route 1, Box 199 A, Artesia, N M 88210

Drilling Began 6/28/82 Completed 6/28/82 Type tools Air Rotary Size of hole 7 7/8 in.

Elevation of land surface or _____ at well is 3363 ft. Total depth of well 20 ft.

Completed well is ☒ shallow ☐ artesian. Monitor Depth to water upon completion of well 9 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
15	17	2	Anhyritic sand	na

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
6	PVC				20		15	20

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
0	7	8		3	Hand

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received August 19, 1982

Quad _____ FWL _____ FSL _____

File No. RA-6975 x Use Observation Location No. 17.26.9.31122

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	5	5	gyp with anhydrite crystals
	10	5	" " " "
	12	2	gyp and granular anhydrite
	15	3	anhydritic sand and clay
	17	2	" " " "
	20	3	anhy sand with limestone gravel

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Dale Hughes
Driller

INSTRUCTIO This fo should be executed in triplicate, preferably typ ten, and submitted to the appropriate district office of the State eer. A tions, except Section 5, shall be answered as pletely and accurat possible when any well is drilled, repaired or deepene. When this form is used as a plugging record, only Section

Revised June 1972

FIELD ENGR. LOG

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well NAVAJO REFINING COMPANY Owner's Well No. 24

Street or Post Office Address Drawer 159

City and State Artesia, N M 88210

Well was drilled under Permit No. RA 6975 X 2 and is located in the:

a. E ¼ SW ¼ SW ¼ NW ¼ of Section 9 Township 17 S Range 26 E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____ Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor S. Dale Hughes License No. WD 749

Address Route 1, Box 199A, Artesia, N M 88210

Drilling Began 7/5/82 Completed 7/5/82 Type tools Air rotary Size of hole 8 in.

Elevation of land surface @ _____ at well is 3362 ft. Total depth of well 19 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 8 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
16	18	2	Anhy sand	na

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
6	PVC				20		15	20

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
0	7	8		3	hand

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by: _____ State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received August 19, 1982

Quad _____ FWL _____ FSL _____

File No. RA-6975 X 2 Use Observation Location No. 17.26.9.13322

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	5	5	gyp & gran. anhydrite
	10	5	" " " "
	16	6	gyp & clay
	18	2	anhydritic sand and gravel
	19	1	gyp and gravel

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Dale Hughes
Driller

INSTRUCTI This fo should be executed in triplicate, preferably t tten, and submitted to the appropriate district office of the State neer. tions, except Section 5, shall be answered a mpletely and accur s possible when any well is drilled, repaired or deepe When this form is used as a cl

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

FIELD ENGR. LOG

Section 1. GENERAL INFORMATION

(A) Owner of well NAVAJO REFINING COMPANY Owner's Well No. 28

Street or Post Office Address Drawer 159

City and State Artesia, N M 88210

Well was drilled under Permit No. RA 6975 X 6 and is located in the:

a. NE ¼ NE ¼ SE ¼ SW ¼ of Section 9 Township 17 S Range 28 26 E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor S. Dale Hughes License No. WD 749

Address Route 1, Box 199 A, Artesia, N M. 88210

Drilling Began 7/7/82 Completed 7/8/82 Type tools Air Rotary Size of hole 8 in.

Elevation of land surface or _____ at well is 3361 ft. Total depth of well 30 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 10 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
10	12	2	anhydritic sand	na

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
6	PVC				30		25	30

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
0	10	8		4	hand

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by: _____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received August 19, 1982

Quad _____ FWL _____ FSL _____

File No. A-6975 X 6 Use _____ Location No. 17.26.9.34223

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	5	5	gyp & red clay
5	10	5	" " "
10	12	2	anhydritic sand & gravel
12	25	13	gyp & gravel
25	30	5	gyp

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Dale Hughes
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 6 need be completed.

Geologic Description

Samp. Meth.	Samp. Log	PID (ppm)	Depth (Feet)	
RB			2	0-0.5' Silt, roots, topsoil.
			4	1-7' Silty clay, light gray, dry 1-3', crystals (calcite?) 3-4', brown with some black, no odor, roots 4-4.5', brown olive brown mottling with crystals 5-6', less mottling 6-7'.
			6	
			8	7-8' Clay, light gray, fine gravel, crystals, very plastic, no odor.
			10	8-10' Missing.
			12	10-13' Clay, light gray, granular, saturated at 10', light gray brown, moist and plastic 10.5-13'.
			14	13 -15.5' Silty clay, light brown, moist, 2" piece of broken limestone gravel at 15'.
			16	15.5-17' Clay, light brown, plastic, slightly moist, platy caliche 16.5-17'.
			18	17-17.5' Gravely clay, light gray, 3/4" gravel, cemented, saturated.
			20	17.5-20' Silty clay, light brown, slightly moist and plastic.
			22	
			24	
			26	

Sample Method Symbols

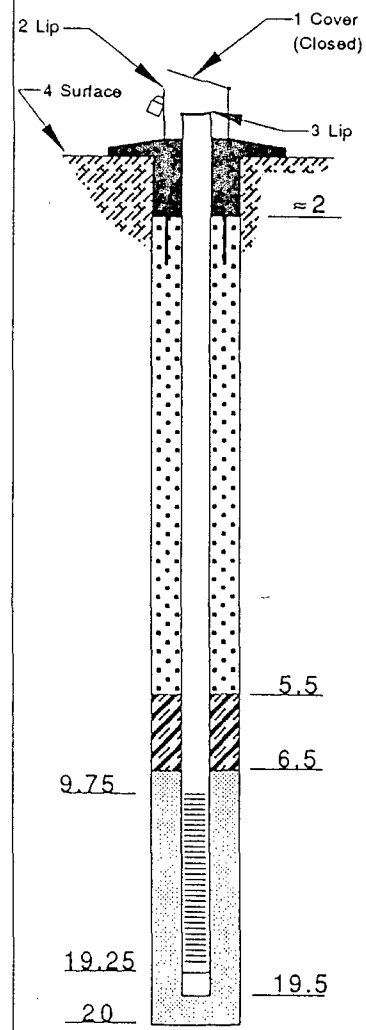
☒ RB=Recovery Barrel ☒ 5' ☐ _____

ST=Shelby Tube | SS=Split Spoon | C=Cutting

Monitoring Well ☒

Piezometer ☐

Protective Casing YES



Depths in Feet from Ground Surface (Not to Scale)

LOG - 1

Design Specifications

Elevations: (feet MSL) 1 3334.52 2 _____ 3 3334.29 4 3331.6

Coordinates: X 7336.58 Y 1645.21

Bore Hole Diameter: 8 1/4"

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☒ 2" ☐ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: CSSI 16-40 silica sand

Bentonite Seal: ☐ 1/4" Pellets ☒ 1/2" Pellets ☐ 1/2" Chips ☐ Hole Plug ☐ _____

Hydrated w/ 5 gallons water

Grout Type: 6% bentonite/Portland Weight: _____

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled by: Precision Engineering Lic.#: _____

Logged by: DGB

Completion Date: 1/10/95

Depth First Encountered Water: 10 ft. BLS

Date	D-T-W	D-T-P	Prod Thick	Field pH	Field EC
1/10/95	11.07				
1/12/95	11.05			6.5	6100
2/5/95	11.19				

Comments: D-T-W from casing lip.

RE/SPEC

MW-29

Project: 318/3.3

Location: Artesia, New Mexico

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

FIELD ENGR. LOG

Section 1. GENERAL INFORMATION

(A) Owner of well NAVAJO REFINING COMPANY Owner's Well No. 29

Street or Post Office Address Drawer 159

City and State Artesia, N M 88210

Well was drilled under Permit No. RA 6975 X 7 and is located in the:

a. ~~NE~~ ¼ ~~NE~~ ¼ SW ¼ NW ¼ of Section 9 Township 17 S Range 26 E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor S. Dale Hughes License No. WD 749

Address Route 1, Box 199 A, Artesia, N M 88210

Drilling Began 7/20/82 Completed 7/21/82 Type tools Air rotary Size of hole 8 in.

Elevation of land surface or _____ at well is 3363 ft. Total depth of well 21.5 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 11 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
20	21.5	1.5	Anhydritic sand	na

Section 3. RECORD OF CASING

Diameter (inches)	Threads per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
6	PVC				22		19	22

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
0	8	8		6	hand

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by: _____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received August 19, 1982

Quad _____ FWL _____ FSL _____

File No. RA-6975 X 7 Use Observation Location No. 17.26.9.13422

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	5	5	miscellaneous fill
	10	5	oil stained gyp
	15	5	gyp
	20	5	gyp
	21.5	1.5	anhydritic sand & gravel

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the described hole.

Dale Hunter
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All questions except Section 5 shall be answered completely and accurately so far as possible.

Well # 39 Navajo Refining Company - Monitor Wells

Drilling Contractor - D. Anderson, El Paso

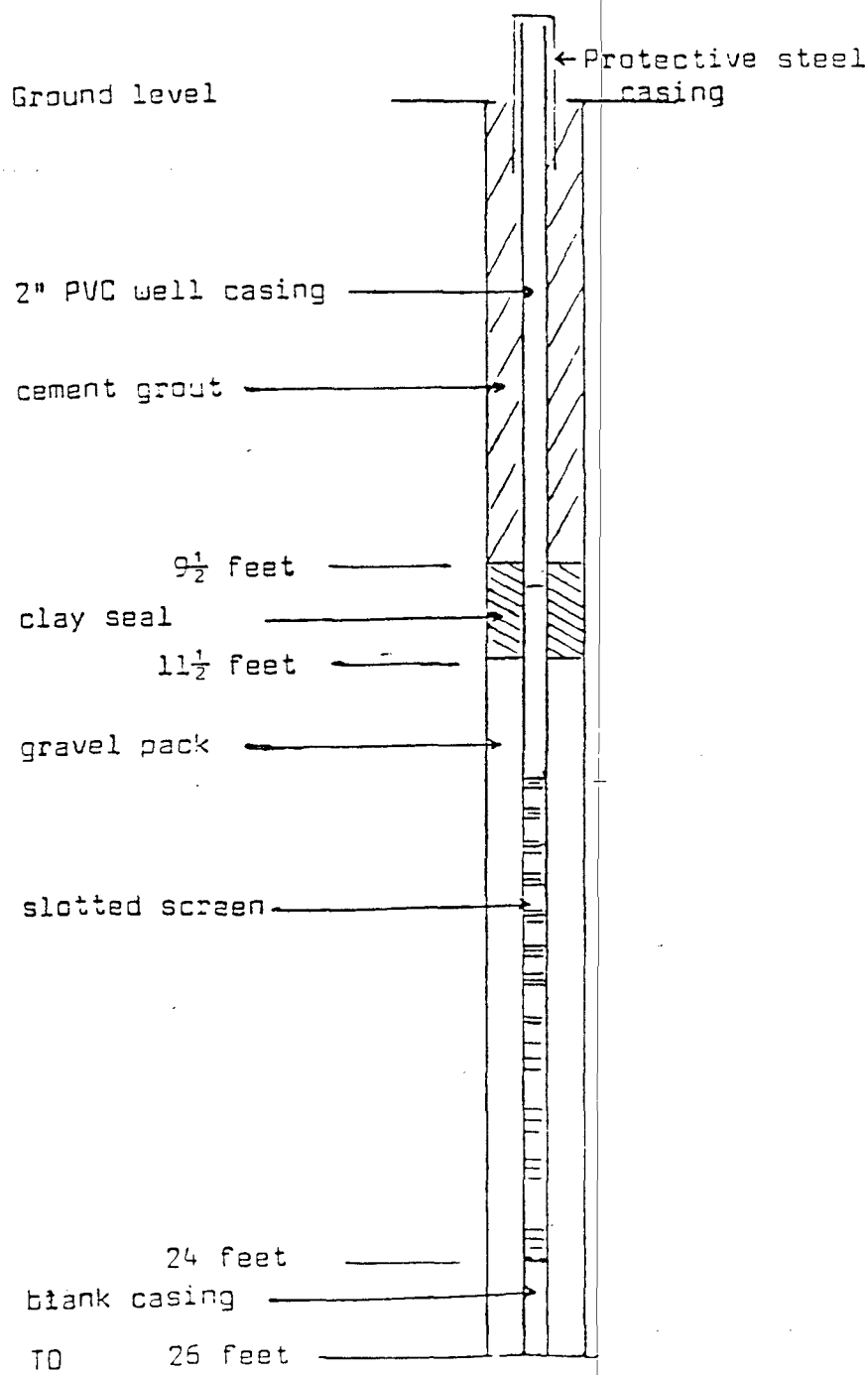
Rig - Hollow stem auger 8" diameter Split spoon core barrel 18"

Date 6/13/84 Richard Fasio & Jim Chaney

Depth	Sample description
0 - 6	Lt. red clayey soil
7½	6.8' mixed soil with gyp pebbles. 7½' white gyp
9¼	8.7' wht gyp - soft. 9¼' gry clay & gyp
10¾	10' wht & gry gyp. 10¾ gyp laminated. odor gas dry at bottom
12¼	10.95' gry gyp. 12¼' dk gry gyp. gyp odor gas
14	gry clay with pebbles, gyp. good oil stain and odor
15½	14½ wht gyp & anhy. 15½ dk gry gyp & anhy. oil stain & odor
17	15¾ dk gry anhy saturated. 17 wht anhy, gyp, rd clay
18½	17½ gry anhy. oil stn. 18½ anhy w rd & gry shale sli odor. rd shale at bottom
20	18.8 gry anhy w anhy pebbles water 20' sdy red clay
21½	red clay & anhy mixed w pebbles - water
23	mixed rd & wht anhy w gran to gravelly material - wtr
24¾	mixed wht & rd anhy sli clay wtr
26	fine rd & wht anhy with clay dry

DETAILS OF WELL CONSTRUCTION

Well # 39 Date 6/13/34 Navajo Refining Company



Measurements from land surface

Well # 41 Navajo Refining Company - Monitor Wells

Drilling Contractor - D. Anderson, El Paso

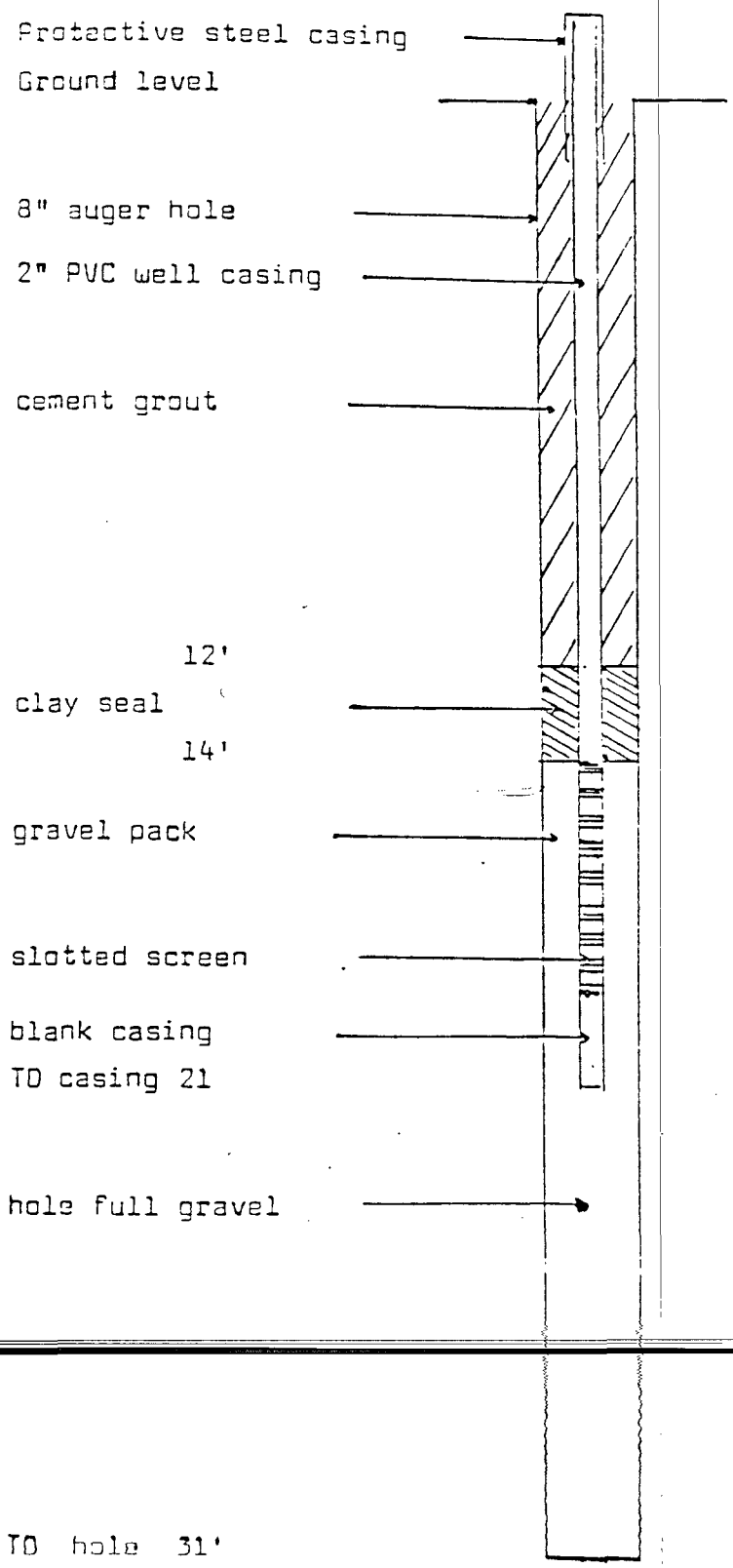
Rig - Hollow stem auger 8" diameter Split spoon core barrel 18"

Date 6/15/84 Richard Fasio & Jim Chaney

Depth	Sample description
0 - 15	Soil. Wet @ 13½' (old Eagle Draw Channel fill)
16½	Wht, tan anhy & gyp - water
18	Wht gyp & anhy (fn xln)
19½	Wht gyp with anhy pieces - gravelly
21	Wht gyp w anhy pcs
22½	Wht, gry gyp w anhy pcs - dense
24	Gry anhy & gyp - dense
25½	Gry anhy & gyp w clay - dense - what at bottom
26 - 27½	Gry sdy clay - tight Tr. red at bottom
29	Red & gry sdy clay
31	Rd sdy shale TD

DETAILS OF WELL CONSTRUCTION

Well # 41 Date 6/15/84 Navajo Refining Company



SAMPLE LOG

Well # 43 Navajo Refining Company - Monitor wells

Drilling Contractor - D. Anderson, El Paso

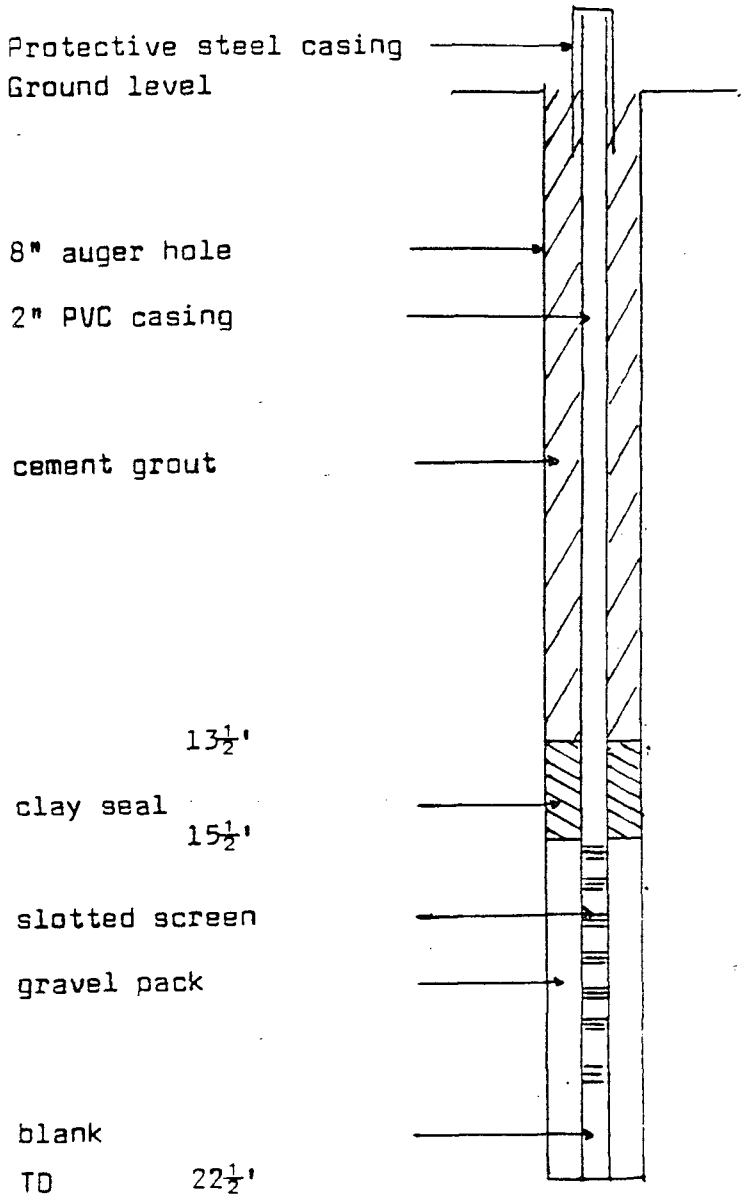
Rig - Hollow stem auger 8" diameter Split spoon core barrel 18"

Date 7/17/84 Jim Chaney - Stroud

Depth	Sample description
0 - 4½	Soil
6	Mixed soil (red) & gyp damp
7½	Mixed red shale & gyp. Vy rd shale @ bottom
9	8.17' mixed soil & gyp. 9' gyp, pebbles, anhy, HCR odor gas
10½	Gyp w anhy pebbles - HCR odor gas. No bldg. oil
12	11¼ Gyp w lst. & anhy pebbles HCR 12' Wht gyp
13½	13 gyp w pebbles, gas stn & odor. 13½ gyp slightly wet
15	13.8 gyp & gravel - oil & water. 15' gyp, gravel, wet free water
16½	15¼ gyp & gravel, wtr. 16½ gry gyp - tight - wet
18	16¾ gyp & loose gravel, wtr. 17½ gyp w anhy & dolo pcs 18' red silty sand
19½	18.6 rd silty sand w pebbles. 19½ rd fn silty sand
22½	Drill - rd silty sand TD

DETAILS OF WELL CONSTRUCTION

Well # 43 Date 7/17/84 Navajo Refining Company



SAMPLE LOG

Well # 45 Navajo Refining Company - Monitor Wells

Drilling Contractor - O. Anderson, El Paso

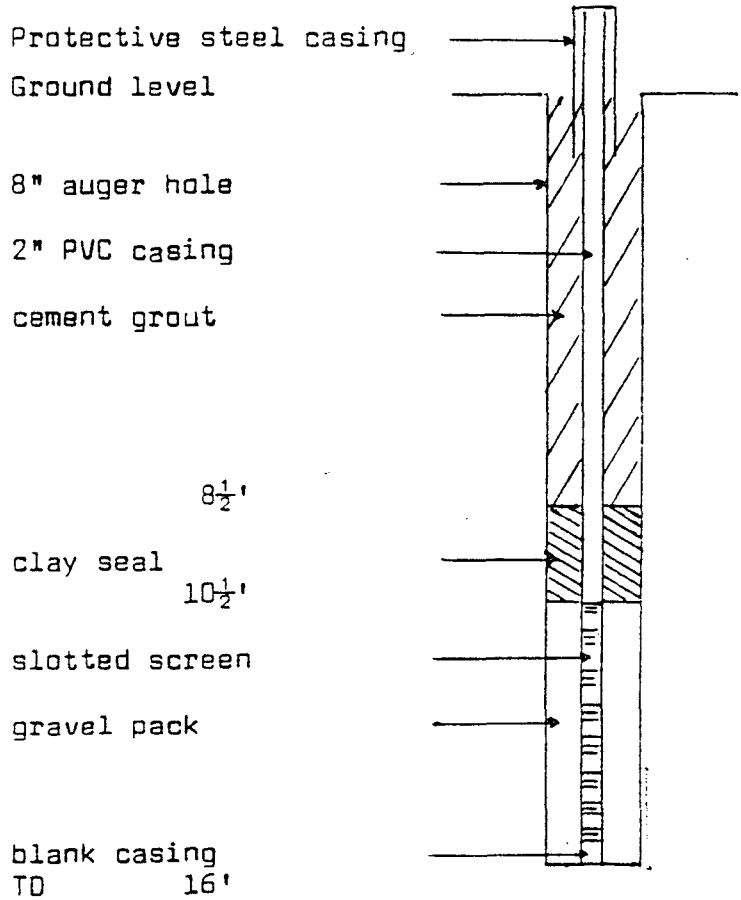
Rig - Hollow stem auger 9" diameter Split spoon core barrel 18"

Date 8/22/84 Stroud & Ledesma

Depth	Sample description
0 - 4½	Red soil dry
5	Gyp dry
6½	6.3 wht gyp - dry. 6½ gry shale - dry
8	Gry sdy shale w very lge anhy pcs - dry
9½	8.8 gry shale & gyp. 9.3 anhy gravel 9½ gry shale & anhy - dry
10	drill
11½	10.8 gry shale w anhy pcs. 11.3 anhy gravel. 11½ gry shale sli damp to dry
13	gry shale w gyp & anhy pcs - damp. Tr rd shale 11½-12.3
14½	14' gravel. 14½ gry shale w gravel streaks - water
16	14.7-15 gry shale & gravel. 15-16 drk gry shale water TD

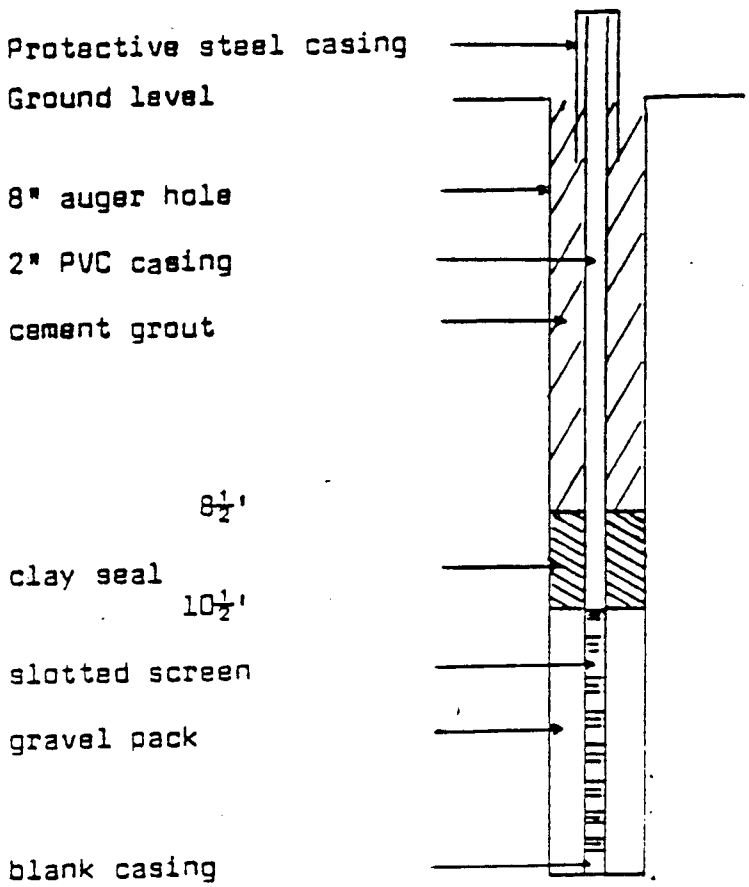
DETAILS OF WELL CONSTRUCTION

Well # 45 Date 8/22/84 Navajo Refining Company



DETAILS OF WELL CONSTRUCTION

Well # 45 Date 8/22/84 Navajo Refining Company



Sample Log

Well # 45 Navajo Refining Company - Monitor wells

Drilling Contractor - D. Anderson, El Paso

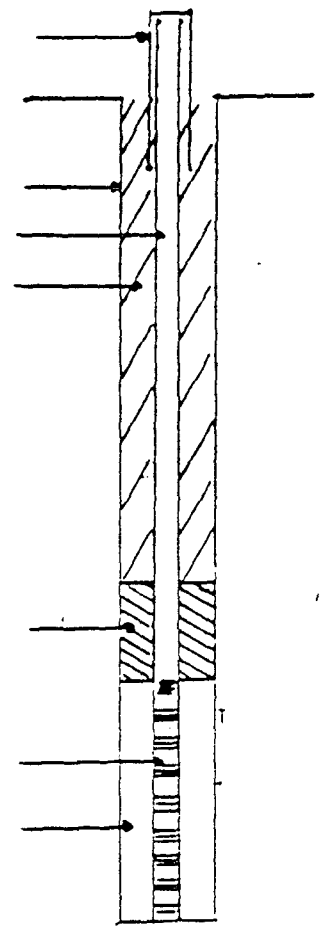
Rig - Hollow stem auger 8" diameter Split spoon core barrel 18"

Date 8/22/84 Stroud & Ledesma

Depth	Sample description
0 - 4½	Red soil dry
5	Gyp dry
6½	6.3 wht gyp - dry. 6½ gry shale - dry
8	Gry sdy shale w very lge anhy pcs - dry
9½	8.8 gry shale & gyp. 9.3 anhy gravel 9½ gry shale & anhy - dry
10	drill
11½	10.8 gry shale w anhy pcs. 11.3 anhy gravel. 11½ gry shale sli damp to dry
13	gry shale w gyp & anhy pcs - damp. Tr rd shale 11½-12.3
14½	14' gravel. 14½ gry shale w gravel streaks - water
16	14.7-15 gry shale & gravel. 15-16 drk gry shale water TD

DETAILS OF WELL CONSTRUCTION

Well # 46 Date 8/22/84 Navajo Refining Company



Well # 46 Navajo Refining Company - Monitor Wells

Drilling Contractor - D. Anderson, El Paso

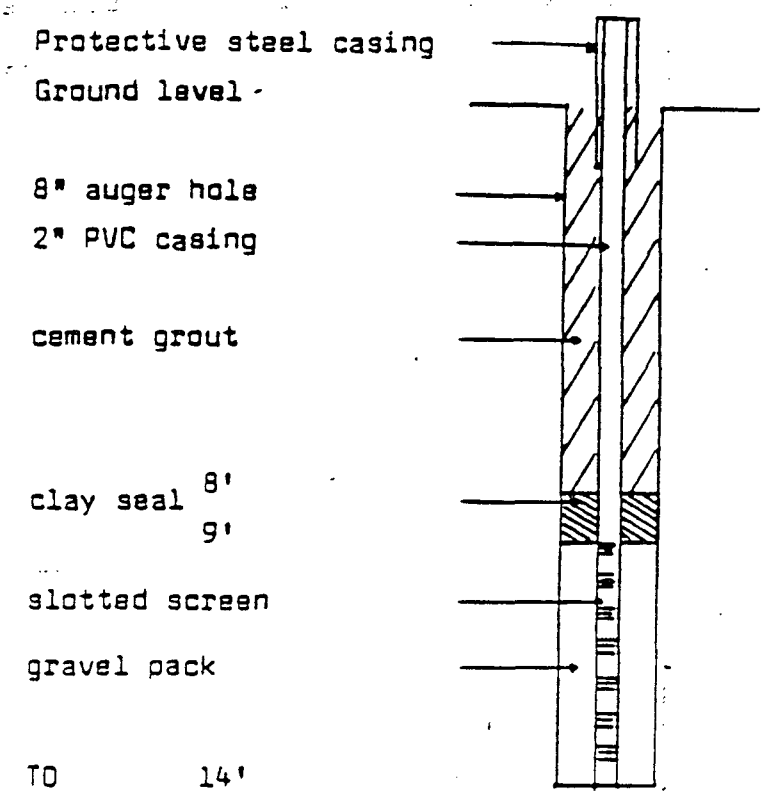
Rig - Hollow stem auger 8" diameter Split spoon core barrel 18"

Date 8/22/84 Stroud & Ledesma

Depth	Sample description
0 - 6½	Dark red soil
8	Lite red soil & gyp dry
11	Gry clay w gyp damp
12½	gry clay, gyp, anhy pcs, tight - dry
14	Gry clay, gyp, anhy gravel water
15½	15.3 gry sdy shale 15½ Red shale
17	Fine red shale. TD

DETAILS OF WELL CONSTRUCTION

Well # 47 Date 8/22/84 Navajo Refining Company



SAMPLE LOG

Well # 47 Navajo Refining Company - Monitor wells

Drilling Contractor - O. Anderson, El Paso

Rig - Hollow stem auger 8" diameter Split spoon core barrel 18"

Date 8/22/84 Stroud & Ledesma

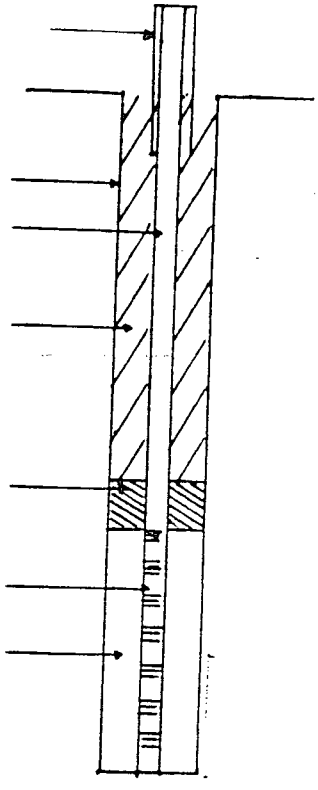
0 - 5	Dark red soil	damp
10	Lite red soil	damp
11½	Red shale	
13	Orange-red shale	damp
14	Orange-red shale	damp

TD

DRAFT

DETAILS OF WELL CONSTRUCTION

Well # 47 Date 8/22/84 Navajo Refining Company



SAMPLE LOG

Well # 47 Navajo Refining Company - Monitor wells

Drilling Contractor - O. Anderson, El Paso

Rig - Hollow stem auger 8" diameter Split spoon core barrel 18"

Date 8/22/84 Stroud & Ledesma

0 -	5	Dark red soil	damp
	10	Lite red soil	damp
	11½	Red shale	
	13	Orange-red shale	damp
	14	Orange-red shale	damp

DRAFT

LOG OF BORING MW-53

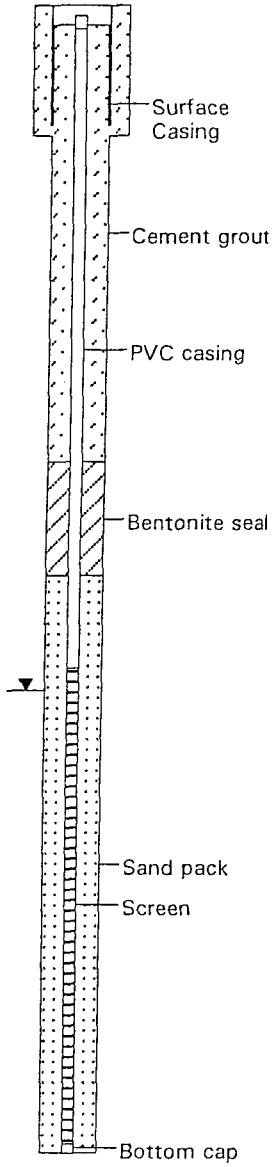
RFI Phase II
North Colony Landfarm
Navajo Refining Company
Artesia, New Mexico

Date Started:	: 06/25/95	Drilling Method:	: Hydraulic push
Time Started	: 0900	Sampling Method:	: 2'x3/4"ID Splitspoon
Date Completed	: 06/25/95	Drilled By:	: Pool Environmental
Hole Diameter:	: 2"	Logged By:	: D.G. Boyer

Depth in Feet	Samples	DESCRIPTION	GRAPHIC	USCS
0		No information		
	1	Silt, light brown, grading to silty clay at 4 ft.		ML
5		4 - 4 ft., clay, brown, white calcite (?) streaks, dry, crumbly, no odor, 1.3 ft. recovery		
	2	Clay, light brown to chalk color, small calcite (?) crystals, no odor, 1.5 ft. recovery		
10	3	Same as above with increasing caliche clay, no odor, 1.5 ft. recovery		CL
	4	Clay, light brown, slightly plastic, becoming crumbly at 12.4 ft., pebble (1/2 in.) at 14 ft., no odor, 2 ft. recovery.		
15	5	Caliche gravel and light brown clay, dry. At 15.2 ft., clay, brown, plastic At 15.6 ft., gravel and caliche to 16 ft., size to 3/4 in., no odor, 2 ft. recovery.		
	6	Same as above. At 16.4 ft., clay, light brown to gray, hard, slightly plastic. At 17.5 ft., silty clay, brown, moist, expansive in split spoon, no odor, 2 ft. recovery. Clay, brown, slightly plastic.		
	7	18.7 - 19.1 ft., clayey gravel, dry		GC
20		19.1 - 20 ft., clay, brown, soft (no moisture), occasional gravel, no odor, 2 ft. recovery.		
	8	Clay, light brown, slightly plastic, but generally hard, no odor, 2 ft. recovery.		
	9	Clay, light brown, occasional small gravel, caliche zones (0.1 - 0.2 ft. thick) at 22.2, 22.7 and 23.8 - 24 ft., clay expanded in spoon, no odor, 2 ft. recovery.		CL
25	10	Clay, light brown, occasional small gravel and caliche zones, no odor, 2 ft. recovery.		
30				

Notes:
Completed hydraulic push at 1000, began auger drilling at 1015. Water on bit at 20 ft, none seen in hole. Auger hole drilled to 24 ft. No PID measurements. Depth to water at 14.24 ft. BLS @ 0915 6/29.

Well: MW-53
ELEV: 3367.67



Well Construction Information

DRILLING INFORMATION

Date completed	: 6/25/95
Hole diameter	: 8 1/4 in.
Depth Hole BLS	: 24
Drilling Method	: HSA
Drilled by	: Pool Environmental
Logged by	: D. G. Boyer

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Screen type	: Johnson Slotted
Screen length	: 10 ft.
Screen opening	: 0.010 slot
Scrn. placement	: 13.8 - 23.8 ft. BLS
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: P-493

SEALS & SAND PACK

Cement seal type	: Cement with 5 % powered bentonite
Seal placement	: 0 - 9.5 ft. BLS
Annular seal type	: Med. bentonite chips, ("Pure Gold")
Seal placement	: 9.5 - 11.9 ft. BLS
Sand pack type	: 10-20 CSSI silica
Sand placement	: 11.9 - 24 ft. BLS

ELEVATIONS

Ground elevation	: 3367.71 ft.
Inner casing, top	: 3367.67 ft.
Outer casing, top	: 3367.87 ft.

NOTES

PID Readings (ppm):

0-3 ft.	Not measured
3-5 ft.	11
8-10 ft.	16
10-12 ft.	9
12-14 ft.	8
14-16 ft.	93
16-18 ft.	96
18-20 ft.	21
20-22 ft.	21
22-24 ft.	18
24-26 ft.	15

(Note: PID likely impacted by moisture or exhibited carry-over from previous sample)

COMPLETION NOTES:
Driller bailed well 6/25/95 to develop. Developed with pump 6/29/95. Purged 30 gallons prior to sampling, pumped approx. 0.5 gpm.
Purge info. @30 gal, 1030: 24 C, 2600 umhos, pH 7
Depth to water prior to sampling: 14.24 ft. below top inner casing.

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LOG OF BORING MW-54A

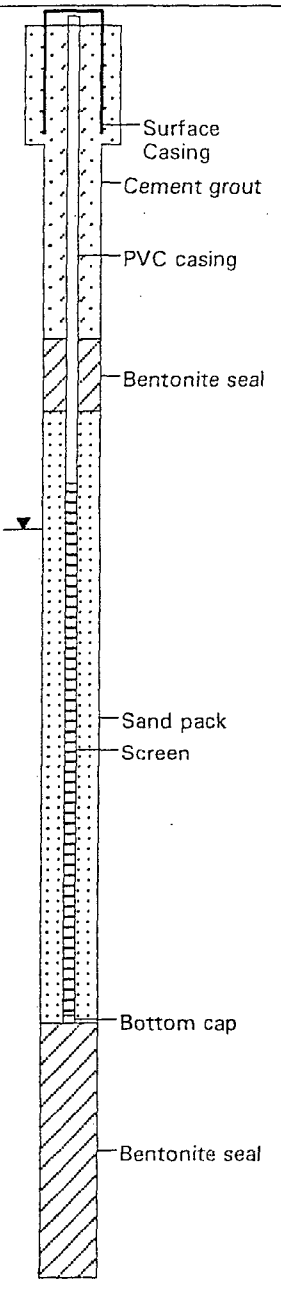
RFI Phase II
North Colony Landfarm
Navajo Refining Company
Artesia, New Mexico

Date Started:	: 12/14/95	Drilling Method:	: Hollow Stem Auger
Time Started	: 1300	Sampling Method:	: 5 ft. core barrel
Date Completed	: 12/14/95	Drilled By:	: Pool Environmental
Hole Diameter:	: 8 1/4 in. OD	Logged By:	: D.G. Boyer

Depth in Feet	Samples	DESCRIPTION	GRAPHIC	USCS
0		Cored with solid stem auger, 0-5 ft. 0-2.5 ft. Clayey silt, brown, some roots, dry. Log from cuttings.		ML
		2.5-5 ft. Silty clay, light brown, dry		
5	1	Clay and caliche. Silty clay, light brown, very dry. Caliche inclusions in clay, chalk color with very small crystals. 2.2 ft. recovery.		
10	2	Clay with caliche 11.9-12.7 ft. Clay, light brown to brown, slightly moist, soft 12.7-14.7 ft. Same as above with caliche gravel to 1 1/4 in. 4.7 ft. recovery.		CL
15	3	15-16.4 ft. Silty clay, light brown, slightly damp. 16.4-18 ft. Same as above, color alternating brn and lt. brn, H/C odor, black streaks at 16.4 ft. 18-18.8 ft. Clay, light brown, no odor. 3.8 ft. recovery.		
20	4	20-20.4 ft. Clay, light brown, saturated, cohesive, plastic. 21.3-22 ft. Silty clay. 22-23.4 ft. Clayey caliche gravels, generally small (<1/2") but some >3", saturated.		GC
25	5	23.4-25 ft. Clay with occassional gravel. 5 ft. recovery. 25-26.9 ft. Silty clay, moist with occassional gravel. 26.9-27.3 ft. Clayey silt, wet, some small gravel. 27.3-29 ft. Silty clay, brown, moist.		CL ML CL
30	6	29-30.4 ft. Silty clay w/some sand and v. fine gravels. 5 ft. recovery. 30.4-31 ft. Silty gravel 31-33 ft. Silty sand, light brown, very fine grained with some clay and gravel, saturated. 33-35 ft. Sand increasing with gravels. River gravels at 35 ft., flat to 3 in. 5 ft. sample recovery		ML GM SM
35				
40				

Notes:
6 in. smear of product on auger when retreived. Backfilled hole to 27.5 ft. with medium bentonite chips.
Depth to water at 14.1 ft. BLS @1130 12/15
Photoionization Detector (PID) readings are from jar headspace analysis of grab samples taken from drill cuttings at designated intervals.

Well: MW-54A
ELEV: 3365.38



Well Construction Information

DRILLING INFORMATION

Date completed	: 12/14/95
Hole diameter	: 8 1/4 in.
Depth Hole BLS	: 35
Drilling Method	: HSA
Drilled by	: Pool Environmental
Logged by	: D. G. Boyer

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Screen type	: Johnson Slotted
Screen length	: 15 ft.
Screen opening	: 0.010 slot
Scrn. placement	: 12.7 - 27.7 ft. BLS
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Above-ground steel
Lock Key #	: P-493

SEALS & SAND PACK

Cement seal type:	Cement with 5 % powered bentonite
Seal placement	: 0 - 8.7 ft. BLS
Annular seal type:	Med. bentonite chips, ("Pure Gold")
Seal placement	: 8.7 - 10.7 ft. BLS
Sand pack type	: 10-20 CSSI silica
Sand placement	: 10.7 - 27.7 ft. BLS

ELEVATIONS

Ground elevation	: 3361.96 ft.
Inner casing, top	: 3365.38 ft.
Outer casing, top:	3365.66 ft.

NOTES

PID Readings (ppm):
(Readings from NCL 95-01)

0-5 ft.	3
5-10 ft.	1
10-15 ft.	5
15-20 ft.	908

COMPLETION NOTES:

12/15/95
Developed with pump, purged approx. 120 gallon to clean, test @ 1.3 gpm with 4' drawdow

12/22/95
Purged 6 gallons prior to sampling, @ 1310:
2500 umhos, pH 7
Depth to water prior to sampling: 17.47 ft. below top inner casing.

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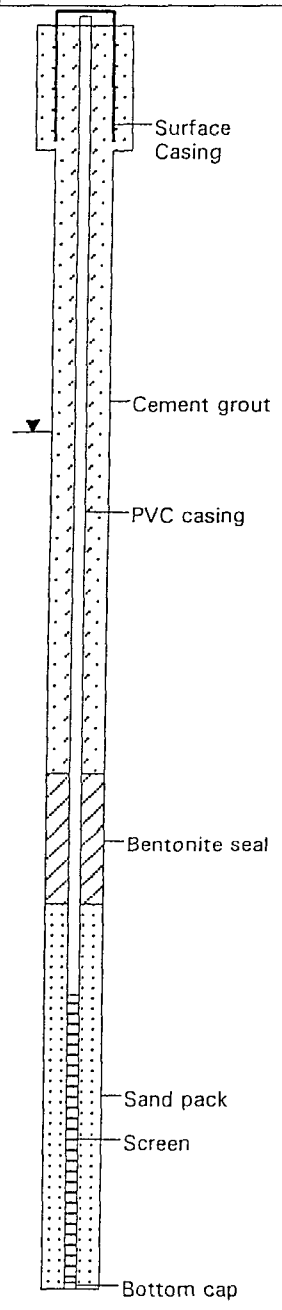
LOG OF BORING MW-54B

RFI Phase II
North Colony Landfarm
Navajo Refining Company
Artesia, New Mexico

Date Started:	: 12/19/95	Drilling Method:	: Hollow Stem Auger
Time Started	: P.M.	Sampling Method:	: 5 ft. core barrel
Date Completed	: 12/20/95	Drilled By:	: Pool Environmental
Hole Diameter:	: 8 1/4 in. OD	Logged By:	: D.G. Boyer

Depth in Feet	Samples	DESCRIPTION	GRAPHIC	USCS
0		Located 12 ft. NE of MW-54A, drilled with 12 in. OD HSA to 30 ft., no boring log record. Left auger in ground for temp. protection/surface casing.		
5		Followed in hole with 8 1/4 in. auger with 5 ft. core barrel (Size 12 in.OD, 9 1/2 in.ID).		
10		Installed well with base at 44 ft.		
15				
20				
25				
30	1	29-32.5 ft. Silty clay, light brown, slightly moist, plastic, occ. gravel (to 2") every 18 in., no odor, becoming slightly sandy,wet @43.5 ft.		CL
		32.5-34.6 ft. Clayey sand, light brn. 4 ft. recovery.		SC
35	2	34.6-36.8 ft. Sandy clay, very fine-grained sand.		
		36.8-37.8 ft. Gravels with clay. River gravel, smooth, rounded, gray to 3 in., saturated. 4 ft. recovery.		GC / CL
40	3	37.8-38.5 ft. Sandy clay. 38.5-42 ft. Gravels, clean, pea-sized up to 3 in.(mainly 3/4-1 1/2 in.)		GW
	4	42-44 ft. Clayey gravel.		GC
45		44-48 ft. Clay, brown, stiff, dry. 5 ft. recovery		CH
50		Notes: Auger jammed w/rock @ 41.5 ft., pulled out core barrel, cleaned, reentered hole.		

Well: MW-54B
ELEV: 3365.36



Well Construction Information

DRILLING INFORMATION

Date completed	: 12/20/95
Hole diameter	: 8 1/4 in.
Depth Hole BLS	: 48
Drilling Method	: HSA
Drilled by	: Pool Environmental
Logged by	: D. G. Boyer

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Screen type	: Johnson Slotted
Screen length	: 10 ft.
Screen opening	: 0.010 slot
Scrn. placement	: 33.8 - 43.8 ft. BLS
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Above-ground steel
Lock Key #	: P-493

SEALS & SAND PACK

Cement seal type	: Cement with 5 % bentonite, tremied
Seal placement	: 0 - 26 ft. BLS
Annular seal type	: Liquid bentonite grout
Seal placement	: 26 - 30.6 ft. BLS
Sand pack type	: 10-20 CSSI silica
Sand placement	: 30.6 - 44 ft. BLS

ELEVATIONS

Ground elevation	: 3362.05 ft.
Inner casing, top	: 3365.36 ft.
Outer casing, top	: 3365.59ft.

NOTES

No PID Readings taken.

COMPLETION NOTES:

Installed well with base at 44 ft. Upon completion, used 17 bags sand to 32 ft. When pulled outer auger, bridged sand rises to 30.6 ft. Added 5 ft. liquid bentonite grout. Cemented to surface with cement grout, mixed in grout tank at ratio of 3 bags cement with 1 cup bentonite powder.

12/21/95
Developed with pump.

12/22/95
Purged 15 gallons prior to sampling, @ 1219: 2400 umhos, pH 7
Depth to water prior to sampling: 17.44 ft. below top inner casing.

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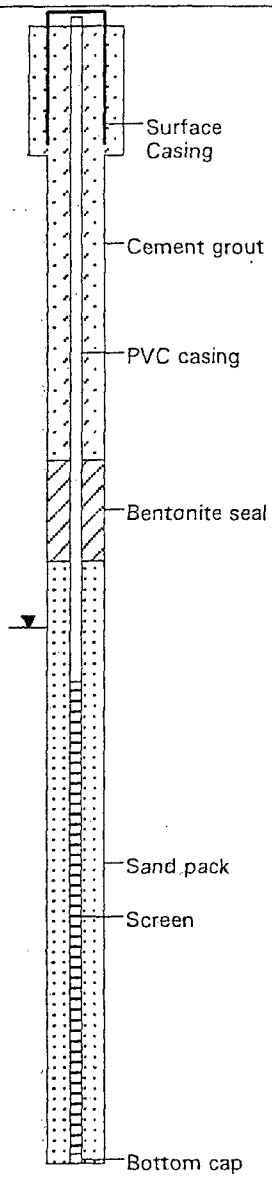
LOG OF BORING MW-55 (NCL 95-07)

RFI Phase II
North Colony Landfarm
Navajo Refining Company
Artesia, New Mexico

Date Started:	: 06/25/95	Drilling Method:	: Hydraulic push
Time Started	: 1215	Sampling Method:	: 2'x3/4"ID Splitspoon
Date Completed	: 06/25/95	Drilled By:	: Pool Environmental
Hole Diameter:	: 2"	Logged By:	: D.G. Boyer

Depth in Feet	Samples	DESCRIPTION	GRAPHIC	USCS
0		No information		
	1	Clay, brown with white streaks, lighter brown at 4.2 ft., no odor, 1.2 ft. recovery		
5				
	2	Clay, brown to chalk color, dry, crumbly, caliche clay at 8 ft., some brown staining on core surface, 1.7 ft. recovery		
10	3	Clay, light brown with soft zones every few inches, extensive small crystals where soft, 2 ft. recovery		
	4	Clay, light brown, fewer zones with crystals, 1 ft. recovery		CL
	5	Clay, light brown, no caliche zones, lighter color and softer at 16 ft., 2 ft. recovery		
15	6	Clay, very light brown, hard, 2 ft. recovery		
	7	Clay, brown, some lighter color zones, no caliche, 2 ft. recovery		
20	8	Same as above, 2 ft. recovery,		
25				
30				

Well: MW-55
ELEV: 3363.57



Well Construction Information

DRILLING INFORMATION

Date completed	: 8/08/95
Hole diameter	: 8 1/4 in.
Depth Hole BLS	: 23.9 ft.
Drilling Method	: HSA
Drilled by	: Pool Environmental
Logged by	: D. G. Boyer

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Screen type	: Johnson Slotted
Screen length	: 10 ft.
Screen opening	: 0.010 slot
Scrn. placement	: 13.7 - 23.7 ft. BLS
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Above-ground steel
Lock Key #	: P-493

SEALS & SAND PACK

Cement seal type	: Cement with 5 % powered bentonite
Seal placement	: 0 - 9.1 ft. BLS
Annular seal type	: Med. bentonite chips, ("Pure Gold")
Seal placement	: 9.1 - 11.2 ft. BLS
Sand pack type	: 10-20 CSSI silica
Sand placement	: 11.2 - 23.9 ft. BLS

ELEVATIONS

Ground elevation	: 3360.75 ft.
Inner casing, top	: 3363.57 ft.
Outer casing, top	: 3363.97 ft.

NOTES

PID Readings (ppm):

0-3 ft.	Not measured
3-5 ft.	30
8-10 ft.	49
10-12 ft.	45
12-14 ft.	29
14-16 ft.	34
16-18 ft.	22
18-20 ft.	18
20-22 ft.	18

(Note: PID likely impacted by moisture or exhibited carry-over from previous sample)

COMPLETION NOTES:

Driller bailed 22 gallons 8/8
Developed with pump 8/9/95
Purged 30 gallons prior to sampling, pumped at 1.5 gpm with pump intake at 20 ft.
Purge info. @25gal, 0855: 22 C, 2800 umhos, pH 7
Depth to water prior to sampling: 15.36 ft. below top inner casing.

Notes:
No odor in any core sample
Depth to water at 17.3 ft. BLS @1600 6/25.
Plugged back hole with medium bentonite chips, hydrated with 5 gallons fresh water. Photoionization Detector (PID) readings are from jar headspace analysis of grab samples taken from drill cuttings at designated intervals. On 8/08/95, hole was redrilled and completed as MW-55 with DTW of 12.3 ft. BLS.

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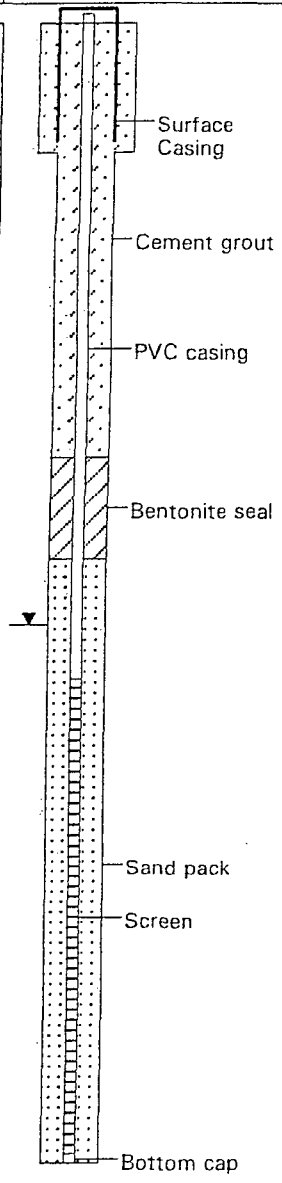
LOG OF BORING NCL 95-07 (MW-55)

RFI Phase II
North Colony Landfarm
Navajo Refining Company
Artesia, New Mexico

Date Started:	: 06/25/95	Drilling Method:	: Hydraulic push
Time Started	: 1215	Sampling Method:	: 2'x3/4"ID Splitspoon
Date Completed	: 06/25/95	Drilled By:	: Pool Environmental
Hole Diameter:	: 2"	Logged By:	: D.G. Boyer

Depth in Feet	Samples	DESCRIPTION	GRAPHIC	USCS
0		No information		
5	1	Clay, brown with white streaks, lighter brown at 4.2 ft., no odor, 1.2 ft. recovery		CL
10	2	Clay, brown to chalk color, dry, crumbly, caliche clay at 8 ft., some brown staining on core surface, 1.7 ft. recovery		
	3	Clay, light brown with soft zones every few inches, extensive small crystals where soft, 2 ft. recovery		
	4	Clay, light brown, fewer zones with crystals, 1 ft. recovery		
15	5	Clay, light brown, no caliche zones, lighter color and softer at 16 ft., 2 ft. recovery		
	6	Clay, very light brown, hard, 2 ft. recovery		
	7	Clay, brown, some lighter color zones, no caliche, 2 ft. recovery		
20	8	Same as above, 2 ft. recovery,		
25				
30				

Well: MW-55
ELEV: 3363.57



Well Construction Information

DRILLING INFORMATION

Date completed	: 8/08/95
Hole diameter	: 8 1/4 in.
Depth Hole BLS	: 23.9 ft.
Drilling Method	: HSA
Drilled by	: Pool Environmental
Logged by	: D. G. Boyer

CASING, SCREEN & CAP

Material, joints	: *PVC, threaded*
Diameter	: 2 in. ID
Screen type	: Johnson Slotted
Screen length	: 10 ft.
Screen opening	: 0.010 slot
Scrn. placement	: 13.7 - 23.7 ft. BLS
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Above-ground steel
Lock Key #	: P-493

SEALS & SAND PACK

Cement seal type:	Cement with 5 % powered bentonite
Seal placement	: 0 - 9.1 ft. BLS
Annular seal type:	Med. bentonite chips, ("Pure Gold")
Seal placement	: 9.1 - 11.2 ft. BLS
Sand pack type	: 10-20 CSSI *silica*
Sand placement	: 11.2 - 23.9 ft. BLS

ELEVATIONS

Ground elevation	: 3360.75 ft.
Inner casing, top	: 3363.57 ft.
Outer casing, top:	3363.97 ft.

NOTES

PID Readings (ppm):

0-3 ft.	Not measured
3-5 ft.	30
8-10 ft.	49
10-12 ft.	45
12-14 ft.	29
14-16 ft.	34
16-18 ft.	22
18-20 ft.	18
20-22 ft.	18

(Note: PID likely impacted by moisture or exhibited carry-over from previous sample)

COMPLETION NOTES:

Driller bailed 22 gallons 8/8
Developed with pump 8/9/95
Purged 30 gallons prior to sampling, pumped at 1.5 gpm with pump intake at 20 ft.
Purge info. @25gal, 0855: 22 C, 2800 umhos, pH 7
Depth to water prior to sampling: 15.36 ft. below top inner casing.

Notes:
No odor in any core sample
Depth to water at 17.3 ft. BLS @1600 6/25.
Plugged back hole with medium bentonite chips, hydrated with 5 gallons fresh water. Photoionization Detector (PID) readings are from jar headspace analysis of grab samples taken from drill cuttings at designated intervals. On 8/08/95, hole was redrilled and completed as MW-55 with DTW of 12.3 ft. BLS.

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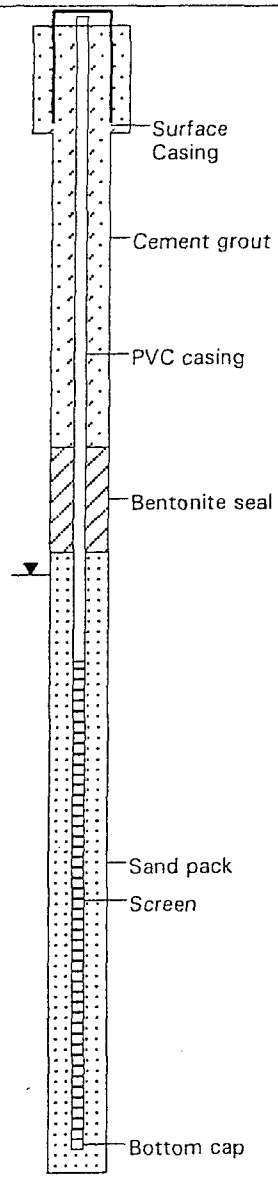
LOG OF BORING MW-56 (NCL 95-16)

RFI Phase II
North Colony Landfarm
Navajo Refining Company
Artesia, New Mexico

Date Started:	: 08/07/95	Drilling Method:	: Hollow Stem Auger
Time Started	: 1315	Sampling Method:	: 5 ft. core barrel
Date Completed	: 08/07/95	Drilled By:	: Pool Environmental
Hole Diameter:	: 8 1/4 in. OD	Logged By:	: D.G. Boyer

Depth in Feet	Samples	DESCRIPTION	GRAPHIC	USCS
0		No information - cored with *solid stem auger*, 0 - 4 ft.		
5	1	Clay, dark brown with white flecks, stiff, plastic, no odor, 2 ft. recovery		
10	2	Same as above. 10.1 - 11.2 ft., *caliche clay*, chalk and light brown mottling, stiff, slightly damp, no odor. 11.2 - 11.8 ft., same as above, very stiff, no odor, 2.8 ft. recovery.		CL
15	3	Caliche clay, brown, dry crumbly, no odor. 16.6 - 17.8 ft., gravelly, 2 in. water in hole. 3.8 ft. recovery.		
20	4	19 - 20.6 ft. Clayey gravel to gravelly clay, light gray to white, caliche gravel to 1 in.		GC
		20.6 - 24 ft. Silty clay, light brown to chalk color with occassional gravel, 5 ft. recovery		CL
25				
30				

Well: MW-56
ELEV: 3362.05



Notes:
NCL 95-16 located 10 ft. N. of Drum Storage Area wall, 103 ft. SE of 95-13, and 232 ft. SW of MW-45.
Depth to water at 12.1 ft. BLS @1345 8/08.
Photoionization Detector (PID) readings are from jar headspace analysis of grab samples taken from drill cuttings at designated intervals. On 8/08/95, hole was bailed by drillers to develop.

Well Construction Information

DRILLING INFORMATION

Date completed	: 8/07/95
Hole diameter	: 8 1/4 in.
Depth Hole BLS	: 24 ft.
Drilling Method	: HSA
Drilled by	: Pool Environmental
Logged by	: D. G. Boyer

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Screen type	: Johnson Slotted
Screen length	: 10 ft.
Screen opening	: 0.010 slot
Scrn. placement	: 13.4 - 23.4 ft. BLS
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Above-ground steel
Lock Key #	: P-493

SEALS & SAND PACK

Cement seal type	: Cement with 5 % powered bentonite
Seal placement	: 0 - 8.8 ft. BLS
Annular seal type	: Med. bentonite chips, ("Pure Gold")
Seal placement	: 8.8 - 11.0 ft. BLS
Sand pack type	: 10-20 CSSI silica
Sand placement	: 11.0 - 24 ft. BLS

ELEVATIONS

Ground elevation	: 3359.13 ft.
Inner casing, top	: 3362.05 ft.
Outer casing, top	: 3362.42 ft.

NOTES

PID Readings (ppm):

0-4 ft.	Not measured
7-9 ft.	0
12-13 ft.	0
15-16 ft.	2
17-18 ft.	2
20-21 ft.	2
23-24 ft.	4

COMPLETION NOTES:

Driller bailed 6.9 gallons 8/8
Developed with pump 8/9/95
Purged 30 gallons prior to sampling, pumped at 1.6 gpm with pump intake at 20 ft.
Purge info. @30 gal, 0940:
23 C, 4700 umhos, pH 7
Depth to water prior to sampling: 14.4 ft. below top inner casing.

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LOG OF BORING MW-61

RCRA Facility Investigation
Group I SWMU/AOC
Navajo Refining Company
Artesia, New Mexico
April 25-29, 2005

Date, Time Started	: 04/27/05; 1400	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 04/27/05; 1815	Logged By	: D.G. Boyer
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION	PID Interval (ft.)	Peak PID Reading (ppm)	Pace Lab No.
0	CB	3.2	AR		0-2 ft. FILL MATERIAL 2-3.2 ft. (slough)			
			CL		3.2-5 ft. CLAY, brown, very stiff, dry, with limestone and caliche gravels to 1 in., no H/C stain or odor			2048818-015
5	CB	3	GC		5-7 ft. SANDY, CLAYEY GRAVEL, moist, sand light brown, fine grained, gravels are limestone river gravels to 2 in., no H/C stain or odor 7.5-9 ft. CLAYEY GRAVEL, light brown, gravels to 2 in.	6-7 8-9	19.0 11.2	
10	CB	5	GC		10-10.8 ft. CLAYEY GRAVEL, light brown,			
			CL		10.8-13.4 ft. GRAVELLY CLAY, mottled gray and light brown, limestone gravels, H/C staining and odor, generally dry but gasoline at 12.2 ft.	11-12 12-14	468 628	
			CA		13.4-13.9 ft. Fractured CALICHE with hydrocarbon product (gasoline)			
			CL		13.9-15 ft. CLAY, gray, stiff, dry, H/C staining and odor			
15	CB	4.6	CL/ML		15-17 ft. SILTY CLAY/CLAYEY SILT/SANDY CLAY (mixture), gray, dry, very fine grained sand, gasoline odor	16-17	422	
			CL		17-19.6 ft. CLAY, some silty, gray, dry, stiff, H/C odor	18-19	456	
20	CB	4.3	CL		20-22 ft. CLAY, light brown, grading from silty to sandy, damp, soft, H/C odor	21-22	907	2048818-019
			SP		22-22.7 ft. SAND, light brown, fine grained, water and gasoline saturated, caliche gravel to 3/4" from 22-22.1 ft.			
			CL		22.7-24.3 ft. SILTY CLAY, mottled gray to light brown, soft, H/C odor	23-24	108	
25	CB	5	CL		25-27.1 ft. CLAY, light brown, soft, plastic, little or no H/C odor 27.1-28.4 ft. CLAY, with caliche gravels to 1/4", brown, 28.4-30 ft. CLAY, mottled with frequent caliche gravel, dry, very stiff, little or no H/C odor	26-27 28-30	80.8 17.9	2048818-020
30								

Notes:
See log of well MW-61 for well construction information.
No lab sample in top 2 ft. - fill material
H/C = Petroleum Hydrocarbon

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LOG OF BORING MW-62

RCRA Facility Investigation
Group I SWMU/AOC
Navajo Refining Company
Artesia, New Mexico
April 25-29, 2005

Date, Time Started	: 04/27/05; 0930	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 04/27/05; 1245	Logged By	: D.G. Boyer
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION	PID Interval (ft.)	Peak PID Reading (ppm)	Pace Lab No.
0	CB	3	AR		0-2 ft. FILL MATERIAL 2-2.9 ft. GRAVELLY SILT, light brown, possible fill material			
			CL		2.9-4.4 ft. GRAVELLY CLAY, light brown to brown, caliche gravels to 1 in.	3-5	20.2	
			CH		4.4-5 ft. FAT CLAY, brown, very stiff, no H/C odor			
5	CB	5	CH		5-7 ft. FAT CLAY, brown, stiff, occasional caliche streaks, no H/C odor 7-8.5 ft. FAT CLAY, gray staining, H2S odor			
			CA/CL		8.5-10 ft. CALICHE, soft with CLAY, light gray, H2S odor	8-10	20.7	
10	CB	4.5	CA/CL		10-12.5 ft. Soft CALICHE and CLAY, mottled light brown and gray, H2S odor, gasoline (?) product at 12 ft. 12.5-14.5 ft. Soft CALICHE and CLAY, gray, dry, gasoline odor throughout zone	11-13	592	2048818-014
						13-15	545	
15	CB	4.5	CA/CL		15-19.5 ft. CALICHE and CLAY mixture, caliche soft, occasional hard fragments, some calcite crystals, clay is silty, mainly gray but some mottled light brown and gray, dry, H2S and gasoline odor throughout.	16-18	382	
						18-20	192	
20	CB	3.2	ML		(20-20.2 ft. slough, gasoline and water saturated) 20.2-21 ft. SILT, black, slightly moist			
			CL/CA		21-23.2 ft. CLAY with soft CALICHE, light gray and dark brown, dry, gasoline odor throughout.			
25	CB	5	CL		25-28.3 ft. CLAY, gray and dark gray, very stiff, dry, gasoline odor 28.3-30 ft. CLAY, mottled brown and light brown, occasional caliche gravel, very stiff, dry, little or no H/C odor			2048818-018
30								

Notes:
See log of well MW-62 for well construction information.
No PID sample in zones of water or hydrocarbon saturation or at base of boring
No lab sample in top 2 ft. - fill material
H/C = Petroleum Hydrocarbon

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LOG OF BORING MW-63

RCRA Facility Investigation
Group I SWMU/AOC
Navajo Refining Company
Artesia, New Mexico
April 25-29, 2005

Date, Time Started	: 04/29/05; 0800	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 04/29/05; 1200	Logged By	: D.G. Boyer
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION	PID Interval (ft.)	Peak PID Reading (ppm)	Pace Lab No.
0	CB	1.8	GC		0-1.8 ft. Sand, clay, gravel mixture, native material to ~2 ft. then cobbles, no H/C stain or odor	1-3	0.1	2048818-021
5			GW		5-6.6 ft. GRAVEL, silty, light brown, large limestone cobbles to 3" (or fragments of bigger ones).			
	CB	2.7	GC		6.6-7.2 ft. CLAYEY GRAVEL, brown, stained, H/C or other chemical odor	7-9	1106	
			CA		7.2-7.7 ft. CALICHE, white, soft, sweet chemical odor 10-10.8 ft. CALICHE, white, horizontally stratified, fractured, water, hydrocarbon saturated.			
10	CB	3.6	CL/CA		10.8-13 ft. CALICHE and SILTY CLAY, gray, with frequent gravel to 2", caliche soft.	11-12	1107	2048818-022
			CA		13-13.6 ft. CALICHE, white, soft, strong H/C and H2S odor throughout	13-15	785	
15	CB	5	CL/CA		15-17.4 SILTY CLAY and CALICHE, clay light grayish-brown, caliche soft, dry, occasional limestone gravel, strong H/C odor	16-18	924	
			CH		17.4-20 ft. FAT CLAY, gray, dry, with occasional limestone gravel	18-20	926	
20	CB	5	CL		20-21 ft. GRAVELLY CLAY, gray, soft, moist, water and thin H/C saturated (possible slough). 21-22 ft. Caliche clay, mottled very light brown (chalk color) and gray, soft, strong H/C odor			
			CH		22-25 ft. FAT CLAY, gray, very stiff, dry, H/C odor			
25	CB	5	CH		25-27.4 ft. (Slough - clay and caliche with H/C odor) 27.4-30 ft. FAT CLAY, light brown (chalk color), with occasional gravel, very stiff, dry, very plastic when wetted, no H/C odor	29-30	3.4	2048818-017
30								

Notes:
See log of well MW-63 for well construction information.
No PID sample in zones of water or hydrocarbon saturation.
H/C = Petroleum Hydrocarbon

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LOG OF BORING MW-64

RCRA Facility Investigation
Group I SWMU/AOC
Navajo Refining Company
Artesia, New Mexico
April 25-29, 2005

Date, Time Started	: 04/28/05; 1030	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 04/28/05; 1430	Logged By	: D.G. Boyer
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION	PID Interval (ft.)	Peak PID Reading (ppm)	Pace Lab No.
0	CB	4	CH		0-4 ft. FAT CLAY, brown and black, H/C staining and odor	2-4	291	2048825-019
						4-5	912	
5	CB	5				6-7	748	
			CL/CA		7.5-10 ft. CLAY with CALICHE, gray and light brown, caliche soft, clay crumbly, H/C odor	7-8	303	
10	CB	4.4	CL		10-11.8 ft. CLAY, gray-black-brown, stiff, dry, H/C odor 11.8-14.4 ft. CLAY, gray, crumbly, dry, gasoline on core from 13.2-13.6 ft.	12-13	486	
						14-15	959	2048825-024
15	CB	5	CL/CA		15-17.3 ft. Clay and caliche, gray clay and soft caliche, H/C saturated (gasoline-light colored, foamy)			
			CL		17.3-20 ft. SILTY CLAY, gray, soft, H/C saturated			
20	CB	3.8	CA		20-21 ft. CALICHE, stratified ("cookie" sized in sample tube), fractured, gasoline saturated.	21-22	946	
			CL/CA		21-23.8 ft. CLAY and soft CALICHE, clay gray, gasoline product or odor through out.	23-24	618	
25	CB	5	CL		25-30 ft. SILTY CLAY, gray, damp, crumbly, H/C odor (?)			
30								

Notes:
See log of well MW-64 for well construction information.
No PID sample in zones of water or hydrocarbon saturation or at base of boring due to hydrocarbon product in tube.
H/C = Petroleum Hydrocarbon

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LOG OF BORING MW-66

RCRA Facility Investigation
Group I SWMU/AOC
Navajo Refining Company
Artesia, New Mexico
April 25-29, 2005

Date, Time Started	: 04/26/05; 0815	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 04/26/05; 1330	Logged By	: D.G. Boyer
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION	PID Interval (ft.)	Peak PID Reading (ppm)	Pace Lab No.
0			AR		0-0.7 ft. FILL MATERIAL			
	CB	1.7	CL		0.7-1.7 ft. SILTY CLAY, brown becoming dark gray at base, septic odor	0-4	431	2048825-001
5						4-5	836	
	CB	5	CL		5-10 ft. FAT CLAY, brown 5-7 ft. then becoming gray from 7-10 ft., soft, H/C odor	6-7	351	
10						9-10	213	
	CB	5	CL/ML		10-15 ft. SILTY CLAY/CLAYEY SILT, black and gray, becoming cream color at base, dry, gasoline odor throughout, trace of H/C product on core barrel	10-12.5	1,018	2048825-020
15						13-15	968	
	CB	3.3	CL		15-17 ft. SILTY CLAY, gray, dry, friable, gasoline odor	15-17	949	
			CL		17-17.8 ft. CLAY, gray, gasoline odor	17-19	871	2048825-018
20			GC		Driller notes cobbles from 19-24 ft. 20-22 ft. CLAYEY GRAVEL, gray, limestone gravel to 2 in., water and H/C saturated.			
	CB	3.2	CL		22-23.2 ft. GRAVELLY CLAY, water saturated			
25			GP		25-26.6 ft. GRAVEL, poorly graded (uniform, pea gravel), with clay			
	CB	4	CL		26.6-27 ft. CLAY, light brown and gray, H/C odor			
			CL		27-28 ft. GRAVELLY CLAY, limestone gravels in tight light brown clay			
			CL		28-29 ft. SILTY CLAY, light brown, slight H/C odor			2048825-002
30								

Notes:
See log of well MW-66 for well construction information.
No PID sample in zones of water or hydrocarbon saturation or at base of boring
H/C = Petroleum Hydrocarbon

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LOG OF BORING MW-65

RCRA Facility Investigation
Group I SWMU/AOC
Navajo Refining Company
Artesia, New Mexico
April 25-29, 2005

Date, Time Started	: 04/26/05; 1530	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 04/26/05; 1730	Logged By	: D.G. Boyer
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION	PID Interval (ft.)	Peak PID Reading (ppm)	Pace Lab No.
0			AR		0-1.9 ft. FILL MATERIAL, asphalt, gravel			
	CB	3	CH		1.9-4 ft. FAT CLAY, brown, becoming black at base, very stiff, H/C odor at base.	2-4	107	2048825-021
5	CB	5	CL		5-10 ft. SILTY CLAY, gray, becoming gray-black at tip, very stiff, strong H/C odor throughout.	5-7 7-9	567 407	
10	CB	3.1	CL CL/ML CA		10-10.4 ft. CLAY, dark gray (slough?) 10.4-12.4 ft. SILTY CLAY/CLAYEY SILT, light brown, strong gasoline odor 12.4-13.1 ft. CALICHE, with clay, hard rock fragments, gasoline odor	11-13 13-15	841 1,097	2048825-022
15	CB	2.6	CA		15-15.4 ft. (slough) 15.4-17.6 ft. CALICHE, clayey, brown, very fractured, gasoline saturated.			
20	CB	5	CL		20-21.5 ft. (slough) 21.5-25 ft. CLAY and SILTY CLAY, brown, very stiff, damp, friable, H/C vapor saturated			
25	CB	5	CL		25-26.3 ft. CLAY, brown, mottled, very stiff 26.3-26.9 ft. CLAY, light gray, mottled, slight H/C odor (?) 26.9-30 ft. FAT CLAY, brown, very stiff, very plastic, slight soft area at 28.5 ft., slight H/C odor (?)			2048825-023
30								

Notes:
See log of well MW-65 for well construction information.
No PID sample in zones of water or hydrocarbon saturation or at base of boring
H/C = Petroleum Hydrocarbon

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LOG OF BORING MW-67

RCRA Facility Investigation
Group I SWMU/AOC
Navajo Refining Company
Artesia, New Mexico
April 25-29, 2005

Date, Time Started	: 04/25/05; 1140	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 04/25/05; 1730	Logged By	: D.G. Boyer
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION	PID Interval (ft.)	Peak PID Reading (ppm)	Pace Lab No.
0	CB	1.9	AR		0-1.9 ft. FILL MATERIAL, clay with uniform gravels 1/2-3/4 in., concrete in tip. Clay brown, very dry, possible slight odor	0-2	0.3	2048804-027
	CT		CL		CLAY (cuttings)			
5	CB	5	CL		5-5.2 ft. Slough 5.2-6.5 ft. SILTY CLAY, brown, dry, possible H/C odor 6.5-7.7 ft. CLAY, mottled light brown, yellow and gray 7.7-10 ft. SILTY CLAY, stratified with black H/C streaks, occasional caliche gravel to 3/4 in., slightly moist, strong H/C odor	5-7	13.0	
						8-10	473	2048804-028
10	CB	5	CL		10-13 ft. CLAY, tight 10.5-12 ft. H/C saturated (gasoline) 13-15 ft. SILTY CLAY	10-12	167	2048804-029
						13-15	250	
15	CB	5	CL		15-17.3 ft. SILTY CLAY, gray, wet, H/C odor	16-17	323	
			CL		17.3-18.7 ft. GRAVELLY CLAY, gray, water and H/C saturated	17-18	269	2048804-030
			CL		18.7-20 ft. SILTY CLAY, gray, slightly damp, H/C odor			
20	CB	5	CL		20-20.9 ft. SILTY CLAY, light gray, H/C odor			
			CL		20.9-21.2 ft. GRAVELLY CLAY, light gray, water saturated, limestone gravels rounded to 2 in.			
			CL		21.2-21.5 ft. SILTY CLAY, light gray, H/C odor	22-23	32.4	
			CL		21.5-22.1 ft. GRAVELLY CLAY, light gray, water saturated, limestone gravels rounded to 2 in.			
25	CB	3.2	CL		22.1-23.2 ft. CLAY, *light gray, tight, moist* 23.2-24.5 SILTY CLAY, mottled light brown and light gray 24.5-25 ft. SILTY CLAY, light brown, slight H/C odor 25-27.3 ft. SILTY CLAY, light yellowish brown, occasional soft caliche gravel 27.3-28.2 ft. CLAY, light brown, dry, very stiff, no H/C staining or odor	24-25	22.9	
						28-30	13.0	2048804-031
30								

Notes:
See log of well MW-67 for well construction information.
H/C = Petroleum Hydrocarbon

C:\Documents and Settings\Dave Boyer\My Documents\Navajo\Artesia Refinery\Monitor Wells 2005\MW-67bor.bo

Well #1 MW-31 (NCL) · Sample Log Page 1 of

Project Navajo Refinery Location SW corner of Colony Landfarm

Drilling Contractor D. Anderson Driller Richard Helper Eddie

Rig Type Hollow stem Hole Diameter 8 inches Drilling Fluid N/A

Type of Sample split spoon & Shelby Date and Time Drilling Began 10/19/82 1:30pm Date and Time Drilling End 3:00

Geraghty and Miller Representative J. Dauchy and T. Bouvette

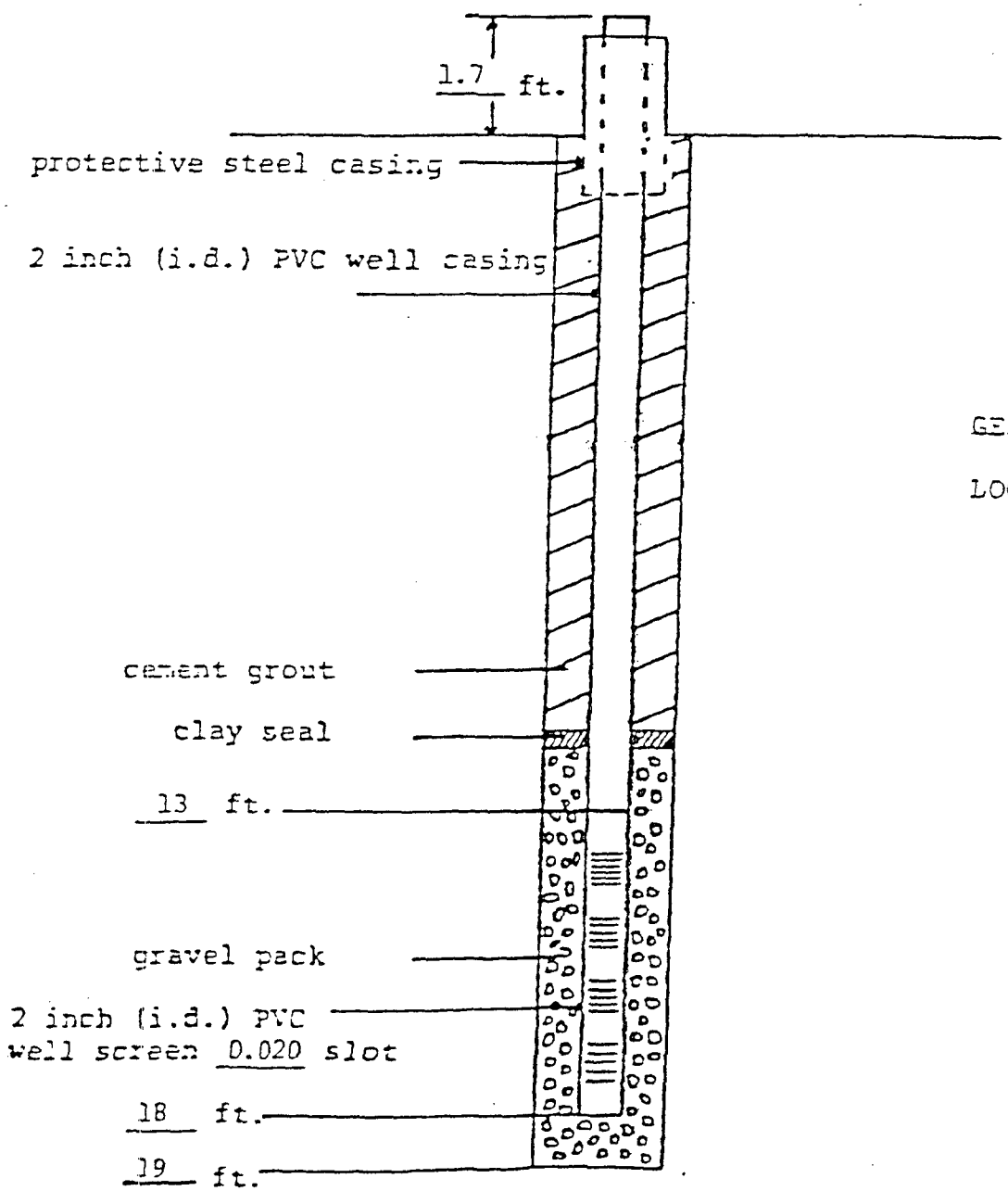
Blows per 6 inches	% Recovery	Sample Description	Depth Feet to Feet
		Fill - brown topsoil with gravel and concrete	0 - 2
		brittle brown silty clay, poorly sorted with white pebbles	2 - 3
		brittle brown silty clay, dense no pebbles	3 - 7
		tan silty clay, plastic, moist	7 - 8½
9 — 11-16	split spoon 8½ - 10	~~gray silty clay w/gyp. & unweather anhydrite~~ poorly sorted, organic smell	8½ - 14
6 - 6 - 8	split spoon 14 - 15½	dolmite gravel water bearing seams (2") interbed w/gray brown silty clay, saturated	14 - 16
4 - - - 5	split spoon 17½ - 19	brown brittle sandy silty clay w/red & white coarse grains	16 - 20
	Shelby tube 20 - 22	red clay, well sorted, unsaturated	20 - 22

DETAILS OF WELL CONSTRUCTION

DATE 10/22/82 WELL #1

PROJECT Navajo Refinery LOCATION

WATER LEVEL MEASUREMENT Held 10.5 Wet 0.34 DTW 10.16



GEOLOGIC LOG

All measurements are referred to land surface except depth to water which is measured from top of casing

Geraghty & Miller Inc.

Well #2 MW-32(NCL) Sample Log Page 2 of

Project Navajo Refinery Location ~~SE corner of Telephone Storage~~ NNR

Drilling Contractor D. Anderson Driller Richard Helper Eddie

Rig Type Hollow stem Hole Diameter 8" inches Drilling Fluid N/A

Type of Sample split spoon & shelby Date and Time Drilling Began 10/20/82 7:20 am Date and Time Drilling End 9:00 a

Geraghty and Miller Representative J. Dauchy T. Bouvette

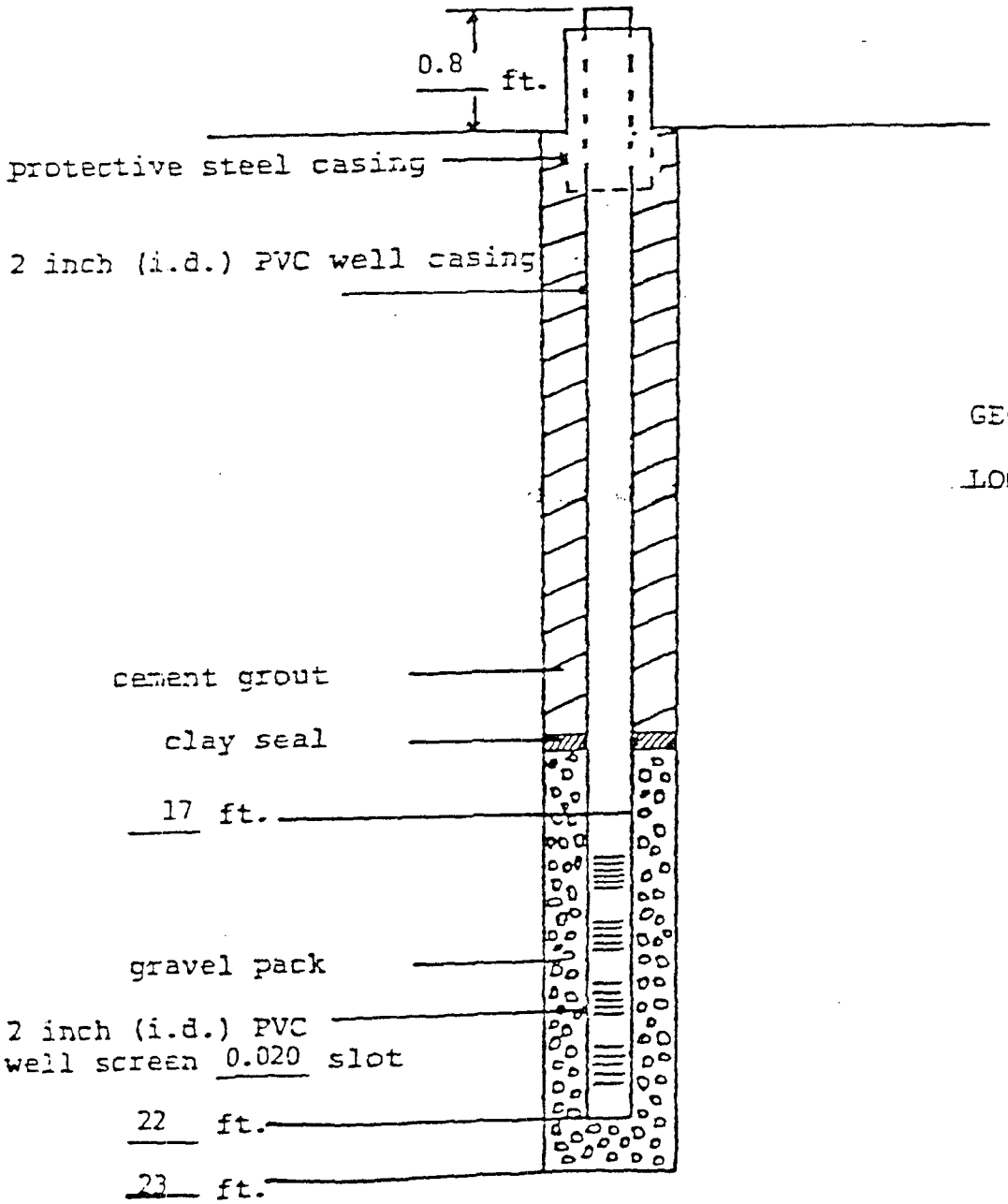
Blows per 6 inches	% Recovery	Sample Description	Depth Feet to Feet
		dark brown topsoil	0 - 2½
		light brown silty clay w/unweather anhydrite, poorly sorted	2½ - 4
3 - 4 - 5	split spoon 5 - 6½	tan silty clay, brittle, poorly sorted	4 - 6
		red silty clay	6 - 6½
5 - 6-10	split spoon 1- - 11½	light brown silty clay, mottled, poorly sorted	6½ - 10½
	organic smell	pebble seam wet, dolmite gravel, 2"	10½
		tan silty clay, same as above	10½ - 13
5 - 8 -12	split spoon 15 - 16½	gray silty clay, well sorted less dense organic smell	13 - 16
9 -16-17	split spoon 17½ - 19	anhydritic sand & pebble seams interbed with brownish red sandy silty clay	16 - 22
6 - 7- 9	split spoon 20 - 21½		
7 - 8-9	split spoon 22½ - 24	red clay, well sorted, dry & hard	22½ - 24

DETAILS OF WELL CONSTRUCTION

DATE 11/22/82 WELL #2

PROJECT Navajo Refinery LOCATION

WATER LEVEL MEASUREMENT Held 10.0 Wet 0.30 DTW 9.7



All measurements are referred to land surface except depth to water which is measured from top of casing

Well #3 MW-33 (NCL) Sample Log Page 3 of ____

Project Navajo Refinery Location NE of Colony @ Entrace Gate

Drilling Contractor D. Anderson Driller Richard Helper Eddie

Rig Type Hollow stem Hole Diameter 8" inches Drilling Fluid N/A

Type of Sample split spoon & Shelby Date and Time Drilling Began 10/20/82 10:00 am Date and Time Drilling End 11.30

Geraghty and Miller Representative J. Dauchy T. Bouvette

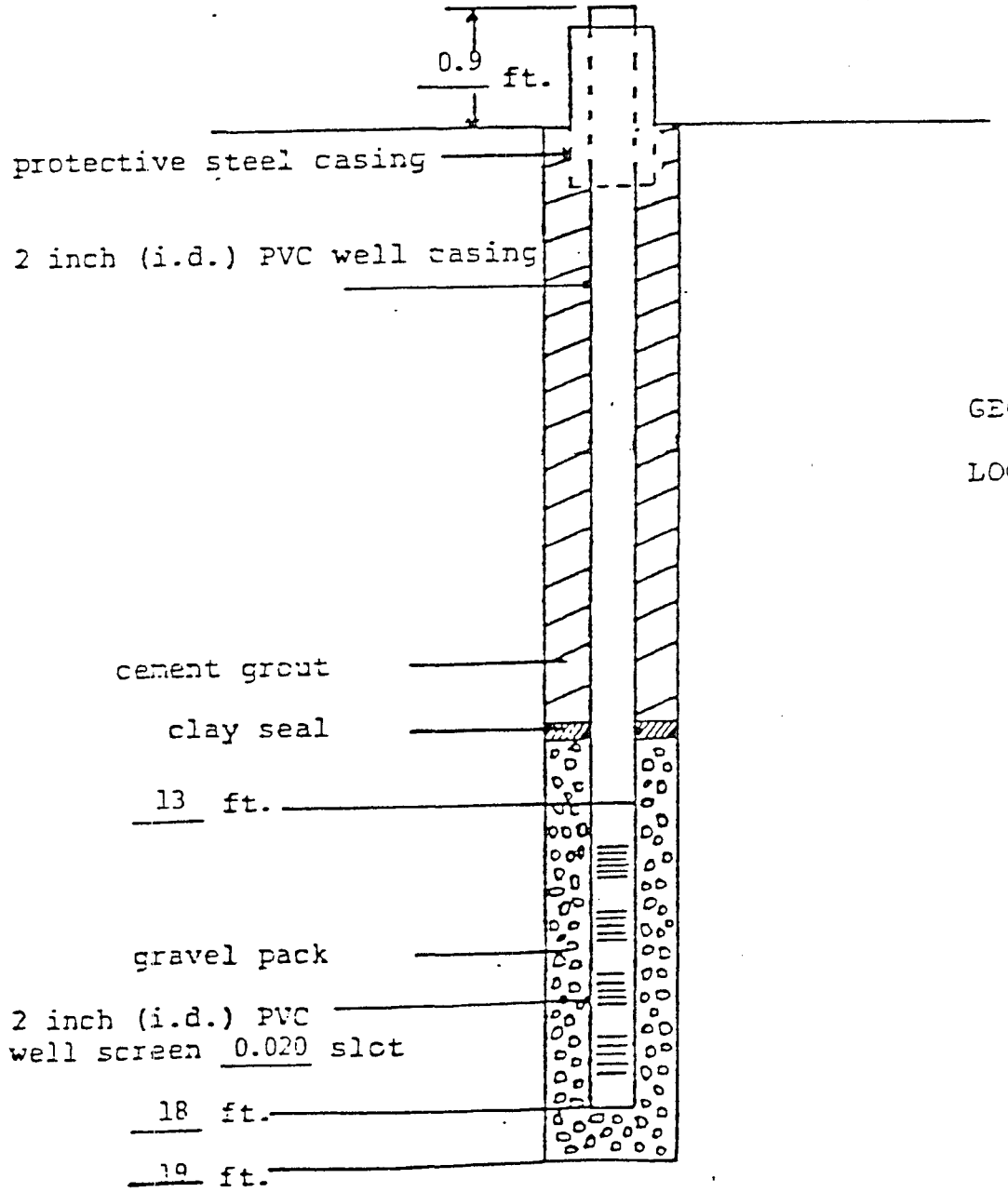
Blows per 6 inches	% Recovery	Sample Description	Depth Feet to Feet
		Brown topsoil	0 - 4
	Shelby tube 10 - 11	poorly sorted light brown silty clay w/unweathered anhydrite	4 - 13
	organic smell	gray brittle silty clay with white & red coarse grains	13 - 14½
3 - 7 - 8	split spoon 15 - 16½	anhydrite sand interbedded in white clay silty clay and red & tan silty clay	14½ - 17
5 - 5 - 7	split spoon 17 - 18½	red clay	17 - 19½

DETAILS OF WELL CONSTRUCTION

DATE 10/22/82 WELL #3

PROJECT Navajo Refinery LOCATION _____

WATER LEVEL MEASUREMENT Held 10.0 Wet 0.19 DTW 9.81



GEOLOGIC LOG

All measurements are referred to land surface except depth to water which is measured from top of casing

Well #4 MW-34 (NCL) Sample Log Page 4 of ____

Project Navajo Refinery Location East fence of Colony

Drilling Contractor D. Anderson Driller Richard Helper Eddie

Rig Type Hollow stem Hole Diameter 8" inches Drilling Fluid N/A

Type of Sample split spoon & shelby Date and Time Drilling Began 10/20/82 2:10 pm Date and Time Drilling End 3:30

Geraghty and Miller Representative J. Dauchy T. Bouvette

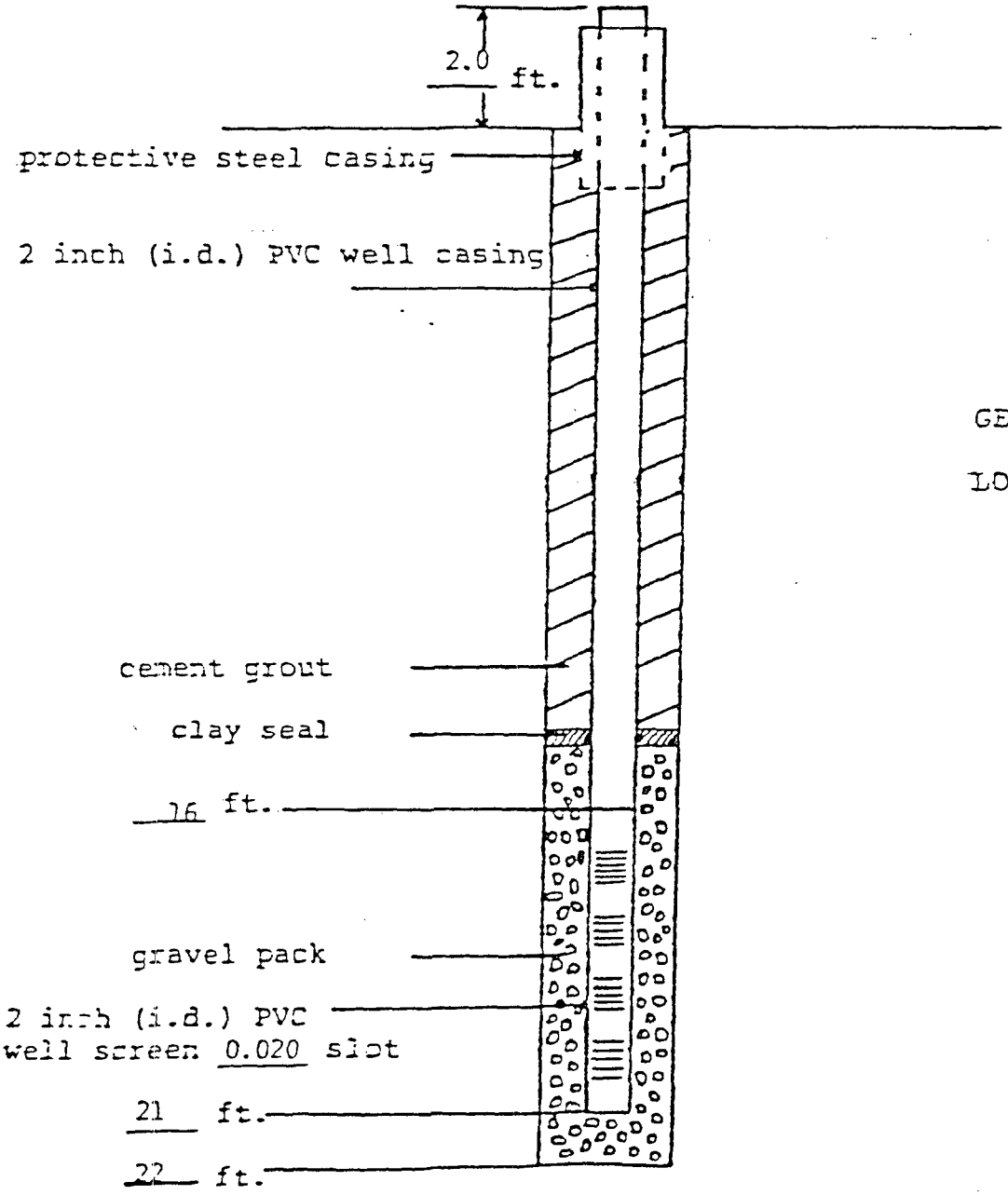
Blows per 6 inches	% Recovery	Sample Description	Depth Feet to Feet
		brown topsoil & fill	0 - 6
	organic smell	gray brown mottled silty clay w/unweather anhydrite, poorly sorted	6 - 10
7 - 12 -16	split spoon 10 - 11½	very brittle gyp in silty clay w/unweathered anhydrite	10 - 16
	shelby tube 15 - 17	water bearing anhydritic sand inter lain in gray silty clay & gyp	16 - 20
		gray clay, well sorted	20 - 22

DETAILS OF WELL CONSTRUCTION

DATE 10/22/82 WELL #4

PROJECT Navajo Refinery LOCATION

WATER LEVEL MEASUREMENT Held 11.3 Wet 0.70 DTW 10.60



GEOLOGIC LOG

All measurements are referred to land surface except depth to water which is measured from top of casing

Samp. Meth.	Samp. Log	PID (ppm)	Depth (Feet)
RB			1–24

Geologic Description

0–8.5' CLAYEY SAND, brown to tan, dry to moist, friable, roots decreasing with depth.

8.5–9' CLAYEY GRAVELS, brown and tan, dry, clay very stiff.

9–10' GRAVEL, tan to white, up to 1–1/2" dia., dry.

10–12' CLAYEY GRAVELS, brown and white, saturated.

12–13.5' SILTY SAND, brown, saturated, fine grained, some small gravel fragements.

13.5–17' CLAYEY SAND, brown, saturated to 16' then moist, clay content increasing with depth.

17–18' CLAYEY GRAVEL, brown and white, saturated.

18–19' SILTY SAND, saturated, fine grained.

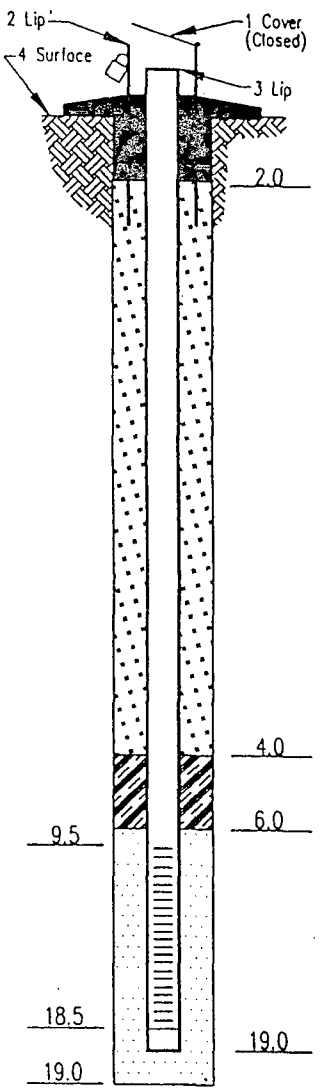
TD = 19.0'

Sample Method Symbols

☒ RB=Recovery Barrel ☒ 5' ☐ ____

ST=Shelby Tube | SS=Split Spoon | C=Cutting

Monitoring Well	
Piezometer	X
Protective Casing	YES



Depths in Feet from Ground Surface (Not to Scale)

LOG-1

Design Specifications

Elevations: (feet MSL) 1 3342.09 2 3342.07 3 3341.89 4 3339.10

Coordinates: X 5384.01 Y 2190.68

Bore Hole Diameter: 8"

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ ____

Casing Diameter: ☒ 2" ☐ 4" ☐ 6" ☐ ____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ ____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ____

Sand Pack: C.S.S.I. 20/40

Bentonite Seal: ☐ 1/4" Pellets ☒ 1/2" Pellets ☐ 1/2" Chips ☐ Hole Plug ☐ ____

Grout Type: Portland/Bentonite Weight: ____

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ ____

Drilled By: Pool Environmental Lic. #: WD 1266

Logged By: PWC

Completion Date: 01/21/93

Depth First Encountered Water: 10.0' BLS

Date	D-T-W	D-T-P	Prod Thick	Field pH	Field EC
2/10/93	11.13				

Comments: ____

KWBES

EC-NP2

Project: 622092005-110 (EC-P2)
Location: Artesia, New Mexico

Samp. Meth.	Samp. Log	PID (ppm)	Depth (Feet)
RB			1–24

Geologic Description

0-1.5' CLAYEY GRAVELS, brown clay, gray gravel, clay is dry, gravel is well rounded.

1.5-8' CLAYEY SAND, brown, moist, friable, clay content increasing with depth.

8-11.5' SILTY GRAVELS, tan silts and sand, gravel is well-rounded, saturated.

11.5-13' CLAYEY SAND, brown, very moist, friable.

13-16' CLAYEY GRAVELS, brown clay, gray gravel, saturated, gravel is well rounded.

16-19' SILTY SAND, tan, satruated, fine grained.

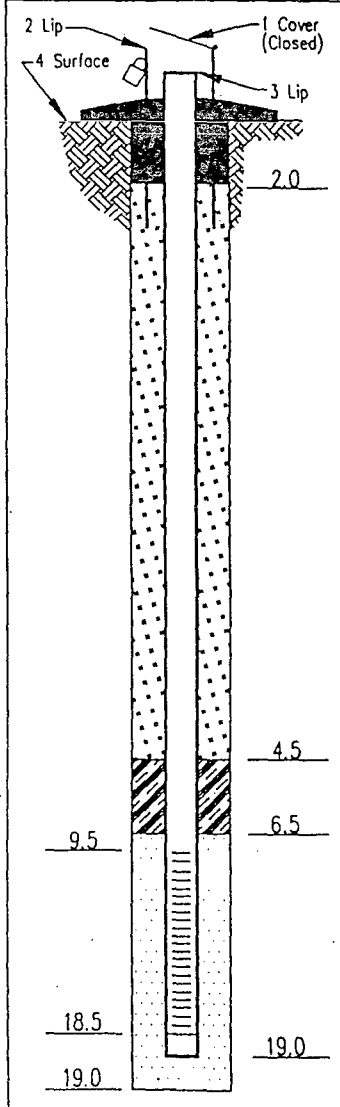
TD = 19.0'

Sample Method Symbols

RB=Recovery Barrel ☒ 5' ☐ ____

ST=Shelby Tube | SS=Split Spoon | C=Cutting

Monitoring Well	
Piezometer	X
Protective Casing	YES



Depths in Feet from Ground Surface (Not to Scale)

LOG-1

Design Specifications

Elevations: (feet MSL) 1 3342.24 2 3342.22 3 3342.05 4 3339.40

Coordinates: X 5790.02 Y 2612.22

Bore Hole Diameter: 8"

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ ____

Casing Diameter: ☒ 2" ☐ 4" ☐ 6" ☐ ____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ ____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ____

Sand Pack: C.S.S.I. 20/40

Bentonite Seal: ☐ 1/4" Pellets ☒ 1/2" Pellets ☐ 1/2" Chips ☐ Hole Plug ☐ ____

Grout Type: Portland/Bentonite Weight: ____

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ ____

Drilled By: Pool Environmental Lic. #: WD 1266

Logged By: PWC

Completion Date: 01/22/93

Depth First Encountered Water: 8.0' BLS

Date	D-T-W	D-T-P	Prod Thick	Field pH	Field EC
2/10/93	13.32				

Comments: ____

KWBES

EC-NP3

Project: 622092005-110 (EC-P3)
Location: Artesia, New Mexico

Samp. Meth.	Samp. Log	PID (ppm)	Depth (Feet)
RB			2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36

Geologic Description

0-11.5' SILTY GRAVELS, sand and silt are tan, dry, gravel is well rounded.

11.5-19' SANDY CLAY, reddish/brown, moist, plastic, clay content increasing with depth.

19-25' CLAY, brown, moist, plastic.

25-29' SANDY CLAY, brown, saturated.

29-34' SILTY SAND, brown, saturated, fine grained.

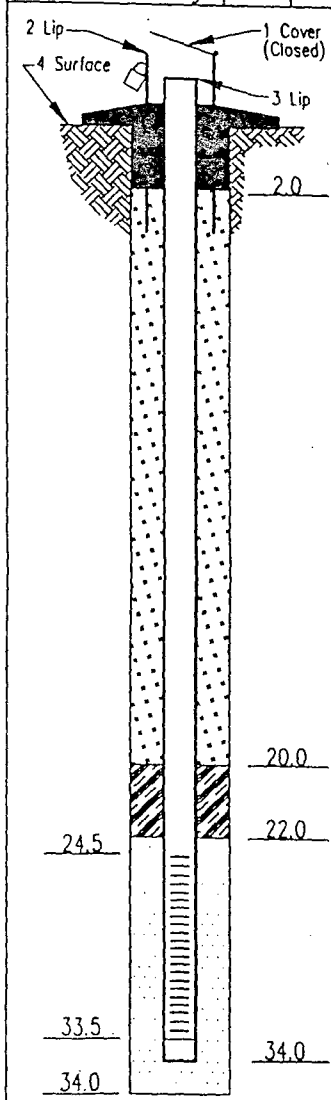
TD = 34.0'

Sample Method Symbols

☒ RB=Recovery Barrel ☒ 5' ☐ ____

ST=Shelby Tube | SS=Split Spoon | C=Cutting

Monitoring Well	
Piezometer	X
Protective Casing	NO



Depths in Feet from Ground Surface (Not to Scale)

LOG-1

Design Specifications

Elevations: 1 3345.01 2 3344.99
(feet MSL) 3 3344.84 4 3342.10

Coordinates: X 6120.29 Y 2960.65

Bore Hole Diameter: 8"

Type of Casing: ☒ PVC Sched. 40 Flush Thread
☐ Stainless Steel ☐ ____

Casing Diameter: ☒ 2" ☐ 4" ☐ 6" ☐ ____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ ____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ____

Sand Pack: C.S.S.I. 20/40

Bentonite Seal: ☐ 1/4" Pellets ☒ 1/2" Pellets
☐ 1/2" Chips ☐ Hole Plug ☐ ____

Grout Type: Portland/Bentonite Weight: ____

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ ____

Drilled By: Pool Environmental Lic. #: WD 1266

Logged By: PWC

Completion Date: 01/23/93

Depth First Encountered Water: 25.0' BLS

Date	D-T-W	D-T-P	Prod Thick	Field pH	Field EC
2/10/93	18.58				

Comments: ____

KWBES

EC-NP4

Project: 622093001-115 (EC-P4)
Location: Artesia, New Mexico

Sym	Samp	Loc	Pr (ppm)	Depth (Feet)
				2
				4
				6
				8
				10
				12
				14
				16
				18
				20
				22
				24
				26
				28
				30
				32

Geologic Description

0-2' SANDY CLAY, dark brown, with roots.

2-14' SANDY CLAY, brown, dry to moist, lighter in color with increasing depth, white caliche pebbles showing up at 9-10 feet, occasional pockets of fine white sand.

14-20' CLAY, reddish brown, moist, some caliche pebbles and sand pockets.

20-22' SANDY CLAY, brown and white, saturated increasing pebble content.

22-23' GRAVEL, 1 to 2" rocks, saturated.

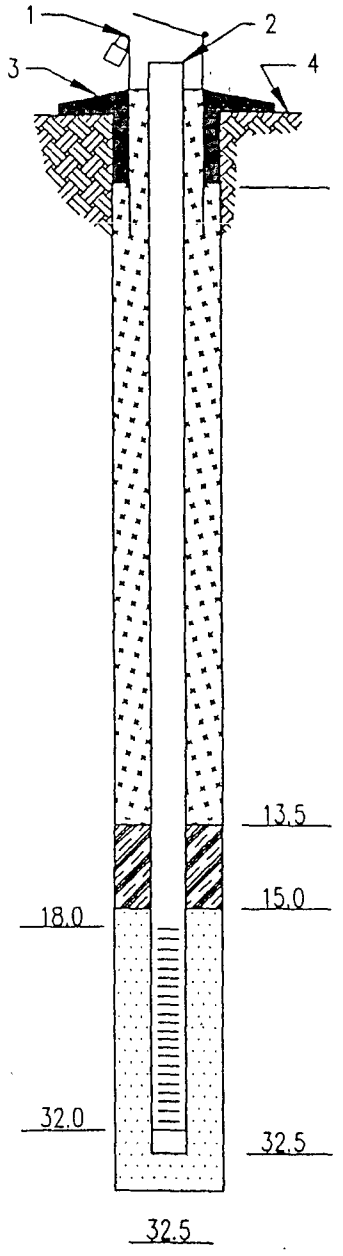
23-32.5' SANDY CLAY, brown and white, moist dry, pebble content decreasing with depth.

TD = 32.5'

NOTE: 5 foot core barrel recovery system used as sampling technique

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Mon. Well ☒
Piezometer



Depths in Feet from Ground Surface (Not to Scale)

Design Specification

Elevations: (feet MSL) 1 3351.07 2 3350.87 3 3349.10 4 3348.7

Coordinates: X 5171.71 Y 5193.86

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: CSSI 16-40

Bentonite Seal: ☐ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☒ 1/4" Pellets ☐ _____

Grout Type: Portland Weight: _____

Bore Hole Diameter: 8"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: PRECISION ENGINEERING

Logged By: PHILIP CADARETTE

Completion Date: FEBRUARY 11, 1992

Date	D-T-W	MSL	Date	Field pH	Field EC
2/19/92	14.7	3336.4			
3/10/92	14.5	3336.2			

Comments: Concrete with 5% bentonite used to grout from seal to surface.

KWBES

KWB1A

Project: 622092001-237 (1A)
Location: ARTESIA, NEW MEXICO

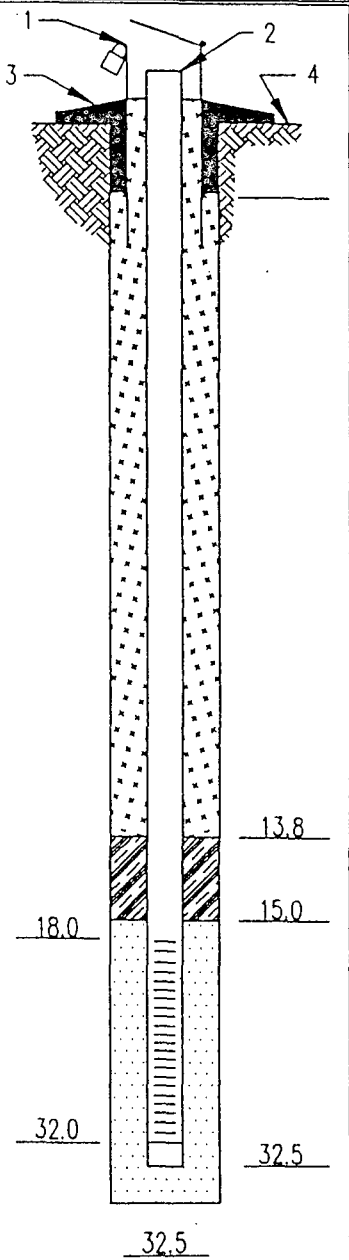
Syn	Samp Loc	PID (ppm)	Depth (Feet)
			2
			4
			6
			8
			10
			12
			14
			16
			18
			20
			22
			24
			26
			28
			30
			32

Geologic Description

0–2'	SANDY CLAY, dark brown, with roots.
2–14'	SANDY CLAY, brown, dry to moist, lighter in color with increasing depth, white caliche pebbles showing up at 9–10 feet, occasional pockets of fine white sand.
14–20'	CLAY, reddish brown, moist, some caliche pebbles and sand pockets.
20–22'	SANDY CLAY, brown and white, saturated, increasing pebble content.
22–23'	GRAVEL, 1 to 2" rocks, saturated.
23–32.5'	SANDY CLAY, brown and white, moist to dry, pebble content decreasing with depth.
	TD = 32.5'

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Monitoring Well ☒
Piezometer ☐



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 3351.06 2 3350.83 3 3349.18 4 3348.8

Coordinates: X 5172.42 Y 5181.92

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☐ 2" ☐ 3" ☒ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: CSSI 16-40

Bentonite Seal: ☐ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☒ 1/4" Pellets ☐ _____

Grout Type: Portland Weight: _____

Bore Hole Diameter: 12"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: PRECISION ENGINEERING

Logged By: PHILIP CADARETTE

Completion Date: FEBRUARY 15, 1992

Date	D-T-W	MSL	Date	Field pH	Field EC
2/19/92	14.4	3336.4			
3/10/92	14.5	3336.3			

Comments: Concrete with 5% bentonite used to grout from seal to surface.

KWBES

KWB1B

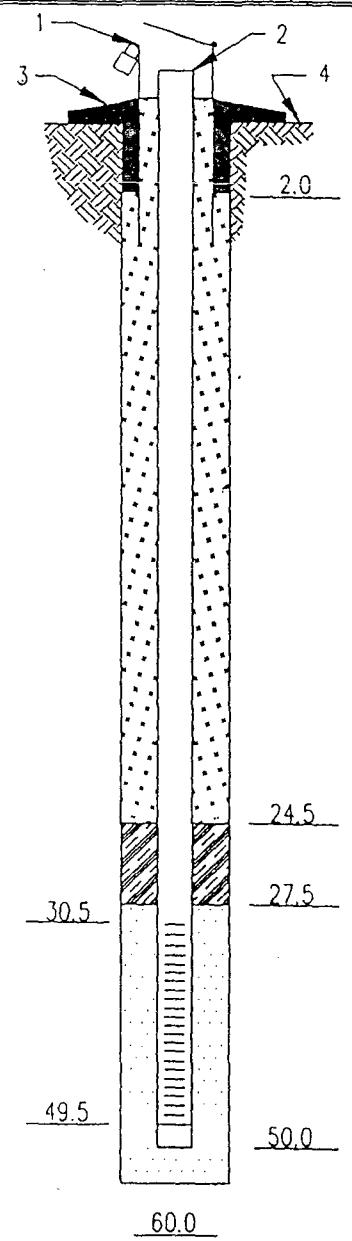
Project: 622092001-237 (1B)
Location: ARTESIA, NEW MEXICO

DRAFT

Sym	Samp Loc	PID (ppm)	Depth (Feet)	Geologic Description
			3	0-2' SANDY CLAY, dark brown to brown, moist, plastic.
			6	
			9	2-6' CLAYEY SAND, brown to tan, moist to slightly moist, friable.
			12	
			15	6-14' SANDY CLAY, brown, moist, friable to firm, occasional fragments to caliche gravel, angular
			18	
			21	14-20' CLAY, brown, moist, plastic, thin gravel seam @ 17', saturated, gypsum crystals throughout clay.
			24	
			27	20-25' SILTY CLAY, brown to white, saturated from 20-23', very moist to moist 23-25'.
			30	25-28' SILT, brown to white, saturated.
			33	
			36	28-32' SILTY CLAY, brown to white, moist with thin intermittent seams to caliche pebbles, saturated.
			39	
			42	32-33' SANDY CLAY, brown, moist, plastic.
			45	33-44' GRAVEL, CLAY, SILT MIX, saturated clay lenses with saturated pebble seams throughout.
			48	
			51	44-45' SANDY CLAY, brown to white, slightly moist, stiff.
			54	
			57	45-59' CLAY, brown, moist with saturated pebble seams throughout
			60	59-60' CLAY, brown, slightly moist, stiff.
				TD = 60.0'
				CME 5' core barrel recovery system

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Monitoring Well ☒
Piezometer



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 _____ 2 _____ 3 _____ 4 _____

Coordinates: X _____ Y _____

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☐ 2" ☐ 3" ☒ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: Colorado Silica Sand 20/40

Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☐ 1/4" Pellets ☐ _____

Grout Type: Portland/5% Bentonite Weight: _____

Bore Hole Diameter: 13.5"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: Precision Engineering

Logged By: PWC

Completion Date: 09/29/92

Date	D-T-W	MSL	Date	Field pH	Field EC

Comments: Boring plugged back to 50 feet before well set

KWBES

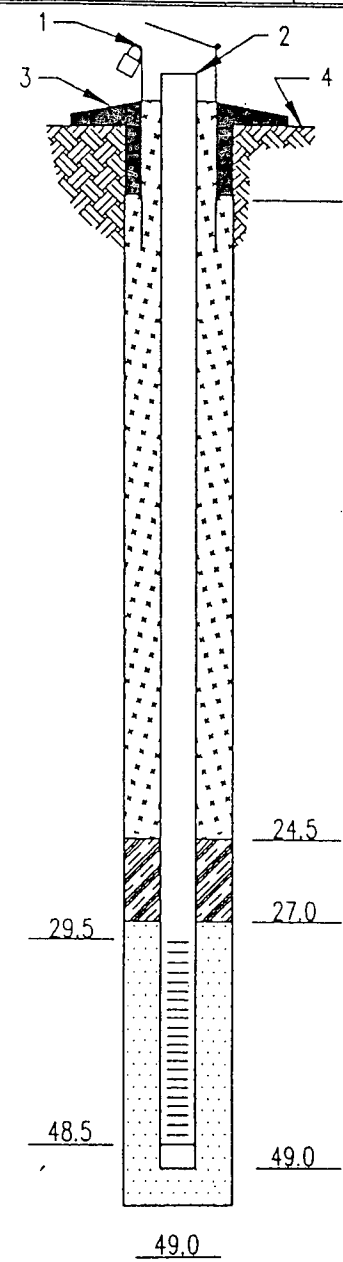
KWB-1C

Project: Navajo 622092003-236
Location: Artesia, New Mexico

Sym	Samp Loc	Depth (Feet)	Geologic Description
		0–16.5'	SANDY CLAY, brown, moist to dry, becoming lighter in color with decreasing moisture, pockets of fine white caliche appearing at 14'.
		16.5–23'	CLAY, brown, moist, stiff to plastic, some black stippling.
		23–29.5'	SANDY CLAY, brown, moist, reaching saturation near 29'.
		29.5–45'	CLAYEY GRAVEL, saturated, fine sand, pebbles, rocks to 3" in diameter, gravel sand–clay mix.
		45–47.5'	SAND, fine grained, brown, saturated.
		47.5–49'	SANDY CLAY, brown, moist to dry.
			TD = 49.0'
			NOTE: 5 foot core barrel recovery system used as sampling technique

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Monitoring Well ☒
Piezometer



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 3366.18 2 3366.04 3 3364.03 4 3363.8

Coordinates: X 1659.24 Y 3905.78

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: CSSI 16–40

Bentonite Seal: ☐ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☒ 1/4" Pellets ☐ _____

Grout Type: Portland Weight: _____

Bore Hole Diameter: 8"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: PRECISION ENGINEERING

Logged By: PHILIP CADARETTE

Completion Date: FEBRUARY 14, 1992

Date	D-T-W	MSL	Date	Field pH	Field EC
2/19/92	29.0	3337.0			
3/10/92	29.3	3336.7			

Comments: Concrete with 5% bentonite used to grout from seal to surface.

KWBES

KWB2A

Project: 622092001–237 (2A)
Location: ARTESIA, NEW MEXICO

Sym	Samp	Loc	PID (ppm)	Depth (Feet)
				2
				4
				6
				8
				10
				12
				14
				16
				18
				20
				22
				24
				26
				28
				30
				32
				34
				36
				38
				40
				42
				44
				46
				48
				50

Geologic Description

0–16.5' SANDY CLAY, brown, moist to dry, becoming lighter in color with decreasing moisture, pockets of fine white caliche (appearing at 14').

16.5–23' CLAY, brown, moist, stiff to plastic, some black stippling.

23–29.5' SANDY CLAY, brown, moist, reaching saturation near 29'.

29.5–45' CLAYEY GRAVEL, saturated, fine sand, pebbles, rocks to 3" in diameter, gravel sand–clay mix.

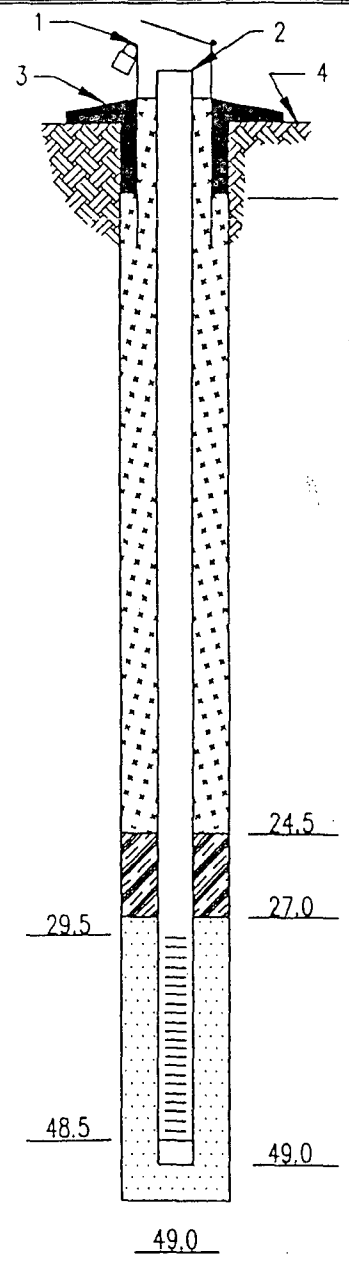
45–47.5' SAND, fine grained, brown, saturated.

47.5–49' SANDY CLAY, brown, moist to dry.

TD = 49.0'

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Monitoring Well ☒
Piezometer ☐



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 3366.40 2 3366.26 3 3364.12 4 3363.9

Coordinates: X 1646.63 Y 3905.71

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☐ 2" ☐ 3" ☒ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: CSSI 16-40

Bentonite Seal: ☐ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☒ 1/4" Pellets ☐ _____

Grout Type: Portland Weight: _____

Bore Hole Diameter: 12"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: PRECISION ENGINEERING

Logged By: PHILIP CADARETTE

Completion Date: FEBRUARY 18, 1992

Date	D-T-W	MSL	Date	Field pH	Field EC
2/19/92	28.9	3337.4			
3/10/92	29.2	3337.1			

Comments: Concrete with 5% bentonite used to grout from seal to surface.

KWBES

Navajo

KWB2B

Project: 622092001-237 (2B)
Location: ARTESIA, NEW MEXICO

Sym	Samp	Loc	Pid (ft)	Depth (Feet)

Geologic Description

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50

0-24' SANDY CLAY, brown, moist, becoming lighter in color with depth to @ 5'
- dryer with depth
- large pockets of white caliche starting around 8'.
- small seam of pebbles @ 17.5'
- intermittent thin seams
- small seam of pebbles @ 17.5'
- intermittent thin seams of fine sand from 17.5 to 20', moist
- occasional small pebbles

24-25' CLAY, brown, stiff, moist.

25-29' SANDY CLAY, brown, interspersed with 6" seams of gravel, saturated.

29-30' CLAYEY GRAVEL, saturated.

30-35' CLAYEY SAND, brown, saturated with pebbles and rock.

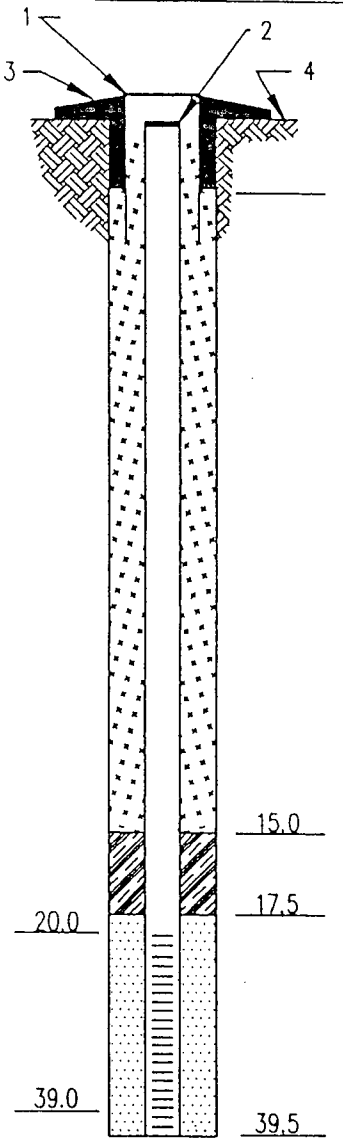
35-39.5' CLAY, brown, dry to moist, increasing sand and moisture with depth - gravel, dry at 39'.

TD = 39.5'

NOTE: 5 foot core recovery system used as sampling technique.

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Mon[illegible]g Well ☒
Piezometer



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 3345.49 2 3345.31 3 3345.49 4 3345.3

Coordinates: X 2183.45 Y 7907.17

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ ____

Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ ____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ ____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ____

Sand Pack: 20/40 Colorado

Bentonite Seal: ☐ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☒ 1/4" Pellets ☐ ____

Grout Type: Type I Portland Weight: ____

Bore Hole Diameter: 8"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ ____

Drilled By: PRECISION ENGINEERING

Logged By: PHILLIP CADARETTE

Completion Date: FEBRUARY 14, 1992

Date	D-T-W	MSL	Date	Field pH	Field EC
2/19/92	20.7	3324.6			
3/10/92	21.0	3324.3			

Comments: Concrete with 5% bentonite used to grout from seal to surface.

KWBES

Navajo

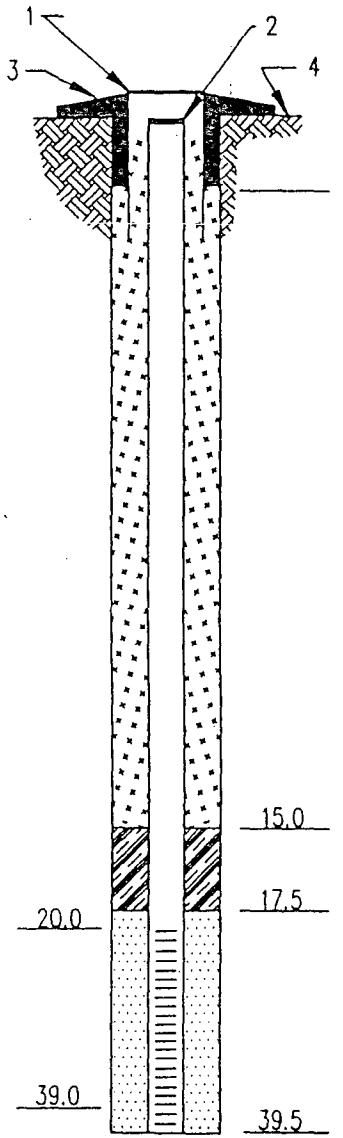
KWB3A

Project: 622092001-237 (3A)
Location: ARTESIA, NEW MEXICO

Sym	Samp Loc	PID (ppm)	Depth (Feet)	Geologic Description
			2	0–24' SANDY CLAY, brown, moist, becoming lighter in color with depth to @ 5'
			4	– dryer with depth
			6	– large pockets of white caliche starting around 8'.
			8	– small seam of pebbles @ 17.5'
			10	– intermittent thin seams
			12	– small seam of pebbles @ 17.5'
			14	– intermittent thin seams of fine sand from 17.5 to 20', moist
			16	– occasional small pebbles
			18	24–25' CLAY, brown, stiff, moist.
			20	25–29' SANDY CLAY, brown, interspersed with 6" seams of gravel, saturated.
			22	
			24	29–30' CLAYEY GRAVEL, saturated.
			26	30–35' CLAYEY SAND, brown, saturated with pebbles and rock.
			28	
			30	35–39.5' CLAY, brown, dry to moist, increasing sand and moisture with depth – gravel, dry at 39'.
			32	
			34	TD = 39.5'
			36	
			38	
			40	
			42	
			44	
			46	
			48	
			50	

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Mon. g Well ☒
Piezometer



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 3345.52 2 3345.10 3 3345.52 4 3345.3

Coordinates: X 2193.17 Y 7905.71

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: 20/40 Colorado

Bentonite Seal: ☐ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☒ 1/4" Pellets ☐ _____

Grout Type: Type I Portland Weight: _____

Bore Hole Diameter: 12"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: PRECISION ENGINEERING

Logged By: PHILLIP CADARETTE

Completion Date: FEBRUARY 15, 1992

Date	D-T-W	MSL	Date	Field pH	Field EC
2/19/92	21.0	3324.1			
3/10/92	21.2	3323.9			

Comments: Concrete with 5% bentonite used to grout from seal to surface.

KWBES

KWB3B

Project: 622092001-237 (3B)
Location: ARTESIA, NEW MEXICO

Sym	Samp	Lor	Depth (Feet)
			2
			4
			6
			8
			10
			12
			14
			16
			18
			20
			22
			24
			26
			28
			30
			32
			34
			36
			38
			40
			42
			44
			46
			48
			50

Geologic Description

0–4.5' SANDY CLAY, brown, moist to dry, becoming lighter in color with decreasing moisture.

4.5–6' CLAYEY SAND, brown, moist.

6–7' SAND, fine grained, brown, moist.

7–25' SANDY CLAY, brown, moist, gray hydrocarbon staining appearing at 8', dark gray to black staining from 8–11', strong odor, staining and odor disappear from 15–16', brown color, gray stain and odor return at 16', thin pebble bed near 18', black, saturated, increasing rock content from 18–25'.

25–27' SILTY SAND, brown, odor.

27–30' SANDY CLAY, gray to brown, moist.

30–35' CLAYEY SAND, dark gray, grossly contaminated, no structure, saturated.

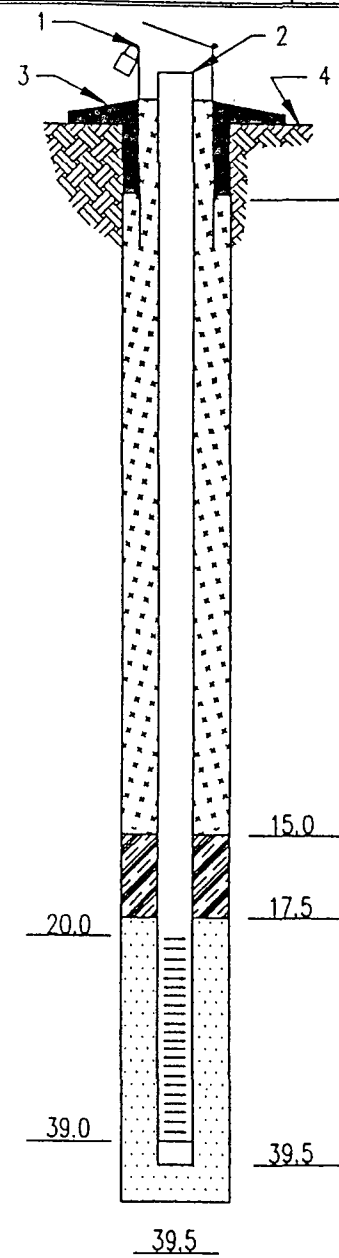
35–39.5' SANDY CLAY, brown, moist to dry.

TD = 39.5'

NOTE: 5 foot core barrel recovery system used as sampling technique

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Mo[illegible]g Well ☒
Piez[illegible]eter ☐



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 3368.33 2 3368.12 3 3365.81 4 3365.4

Coordinates: X 2811.44 Y 3574.80

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☐ 2" ☐ 3" ☒ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: CSSI 16-40

Bentonite Seal: ☐ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☒ 1/4" Pellets ☐ _____

Grout Type: Portland Weight: _____

Bore Hole Diameter: 12"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: PRECISION ENGINEERING

Logged By: PHILIP CADARETTE

Completion Date: FEBRUARY 17, 1992

Date	D-T-P	MSL	D-T-W	Field pH	Field EC
2/19/92			24.2		
3/10/92	24.0	3344.1	26.1		

Comments: Concrete with 5% bentonite used to grout from seal to surface.

KWBES

Navajo Nation

KWB4

Project: 622092001-237 (KWB4)
Location: ARTESIA, NEW MEXICO

Sym	Samp	Loc	PID (ppm)	Depth (Feet)
				2
				4
				6
				8
				10
				12
				14
				16
				18
				20
				22
				24
				26
				28
				30
				32
				34
				36
				38
				40
				42
				44
				46
				48
				50

Geologic Description

0-9' SANDY CLAY, brown, moist to dry, becoming lighter in color with decreasing moisture.

9-10' CLAY, brown, moist.

10-15' SANDY CLAY, brown, dry to moist, gray hydrocarbon staining starting at 14'.

15-29' CLAYEY SAND, gray staining with strong hydrocarbon smell, dry to moist.

29-31' SANDY CLAY, gray staining, strong odor, moist.

31-38' SATURATED SILT, brown, strong odor, sheen.

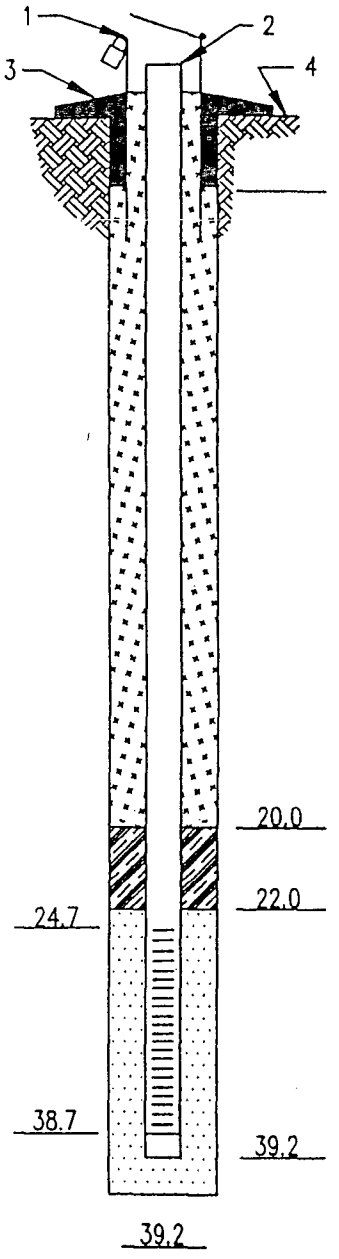
38-39.5' CLAY, brown, stiff, dry.

TD = 39.2'

NOTE: 5 foot core barrel recovery system used as sampling technique

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Mon. .g Well ☒
Piezometer



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 3363.02 2 3362.87 3 3360.92 4 3360.6

Coordinates: X 2928.10 Y 4245.94

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ ____

Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ ____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ ____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ____

Sand Pack: CSSI 16-40

Bentonite Seal: ☐ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☒ 1/4" Pellets ☐ ____

Grout Type: Portland Weight: ____

Bore Hole Diameter: 8"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ ____

Drilled By: PRECISION ENGINEERING

Logged By: PHILIP CADARETTE

Completion Date: FEBRUARY 11, 1992

Date	D-T-P	MSL	D-T-W	Field pH	Field EC
2/19/92			23.1		
3/10/92	23.3	3339.6	23.4		

Comments: Concrete with 5% bentonite used to grout from seal to ground surface.

KWBES

Naval Petroleum Reserves

KWB5

Project: 622092001-237 (KWB5)
Location: ARTESIA, NEW MEXICO

Sym	Samp	Loc	Depth (Feet)
			2
			4
			6
			8
			10
			12
			14
			16
			18
			20
			22
			24
			26
			28
			30
			32
			34
			36
			38
			40
			42
			44
			46
			48
			50

Geologic Description

0–5' SANDY CLAY, brown, moist to dry, becoming lighter in color with decreasing moisture.

5–13' SANDY CLAY, light brown, dry to moist, showing white streaks of caliche at 10'.

13–15' CLAY, dark brown, dry to moist.

15–29' CLAYEY SAND, brown, moist, slight gray discoloration starting at 16.5', black and gray hydrocarbon staining from 17–20', thin gravel layers at 18', discoloration lessening with depth, brown clayey sand alternating with thin bands of gravel starting at 20'.

29–35' CLAYEY SILT, brown to tan, saturated.

35–38' SAND with GRAVEL, tan, saturated.

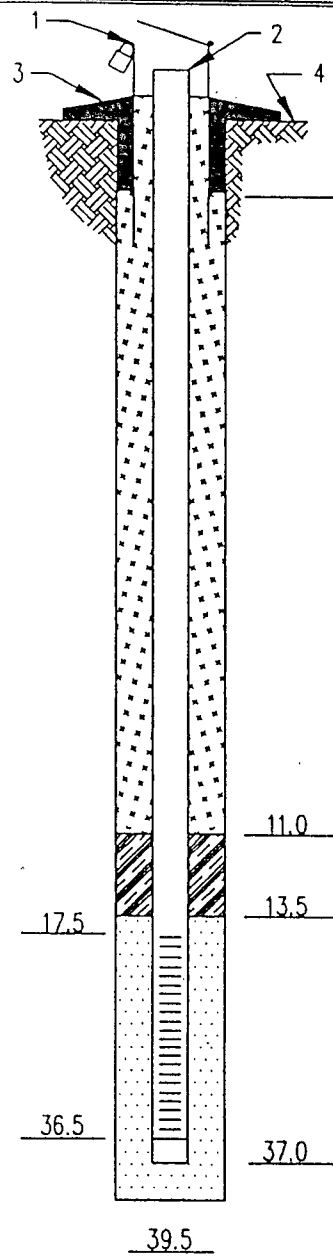
38–39.5' CLAY, brown, stiff, dry.

TD = 39.5'

NOTE: 5 foot core barrel recovery system used as sampling technique

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Mon[illegible] Well ☒
Piez[illegible]eter



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 3358.71 2 3358.55 3 3356.41 4 3356.1

Coordinates: X 2652.58 Y 5161.82

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: CSSI 16–40

Bentonite Seal: ☐ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☒ 1/4" Pellets ☐ _____

Grout Type: Portland Weight: _____

Bore Hole Diameter: 8"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: PRECISION ENGINEERING

Logged By: PHILIP CADARETTE

Completion Date: FEBRUARY 12, 1992

Date	D-T-P	MSL	D-T-W	Field pH	Field EC
2/19/92	21.6	3337.0	24.8		
3/10/92	21.8	3336.8	25.1		

Comments: Concrete with 5% bentonite used to grout from seal to ground surface.

KWBES

Naval [illegible]

KWB6

Project: 622092001–237 (KWB6)
Location: ARTESIA, NEW MEXICO

Sym	Samp	Loc	PI (ppm)	Depth (Feet)
				2
				4
				6
				8
				10
				12
				14
				16
				18
				20
				22
				24
				26
				28
				30
				32
				34
				36
				38
				40
				42
				44
				46
				48
				50

Geologic Description

0-4' CLAYEY SAND, brown, moist, becoming lighter colored with depth.

4-15' SANDY CLAY, brown, moist to dry, occasional small pebbles of caliche, white bands of fine grain caliche increasing in frequency to 10', gravel content increasing with depth, 2" diameter rocks encountered at 14.5'.

15-17' GRAVEL, silty, moist.

17-20' CLAYEY SAND, brown, saturated.

20-22' SILTY SAND, brown, saturated, some gravel.

22-30' CLAYEY GRAVEL, saturated, increasing clay content with depth.

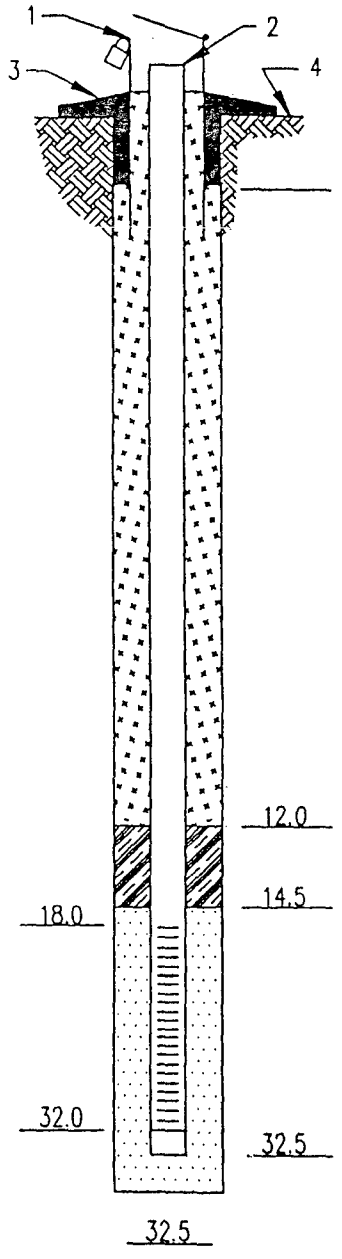
30-32.5' CLAY, brown, stiff, moist to dry.

TD = 32.5'

NOTE: 5 foot core barrel recovery system used as sampling technique

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Mon. g Well ☒
Piezometer



Depths in Feet from Ground Surface (Not to Scale)

Design Specification

Elevations: (feet MSL) 1 3344.14 2 3344.00 3 3341.80 4 3341.6

Coordinates: X 3484.17 Y 8055.72

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: CSSI 16-40

Bentonite Seal: ☐ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☒ 1/4" Pellets ☐ _____

Grout Type: Portland Weight: _____

Bore Hole Diameter: 8"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: PRECISION ENGINEERING

Logged By: PHILIP CADARETTE

Completion Date: FEBRUARY 13, 1992

Date	D-T-W	MSL	Date	Field pH	Field EC
2/19/92	19.5	3324.5			
3/10/92	20.8	3323.2			

Comments: Concrete with 5% bentonite used to grout from seal to ground surface.

KWBES

Navajo Refining

KWB7

Project: 622092001-237 (KWB7)
Location: ARTESIA, NEW MEXICO

Sym	Samp Loc	PID (ppm)	Depth (Feet)
			2
			4
			6
			8
			10
			12
			14
			16
			18
			20
			22
			24
			26
			28
			30
			32
			34
			36
			38
			40
			42
			44
			46
			48
			50

Geologic Description

0-2' CLAYEY SAND, brown, moist, becoming lighter colored with depth.

2-25' SANDY CLAY, brown, moist to dry, becoming lighter in color with depth to 5', thin banding of caliche nodules noted at various depths, banding becoming thicker with depth, slight gray hydrocarbon staining evident at 15', darker gray hydrocarbon staining with depth, odor increasing, 2" gravel seam, saturated at 23'.

25-28' CLAYEY SAND, dark gray, from 23-26', strong hydrocarbon odor, saturated.

28-33' SILTY SAND, brown, saturated, slight staining, decreased odor.

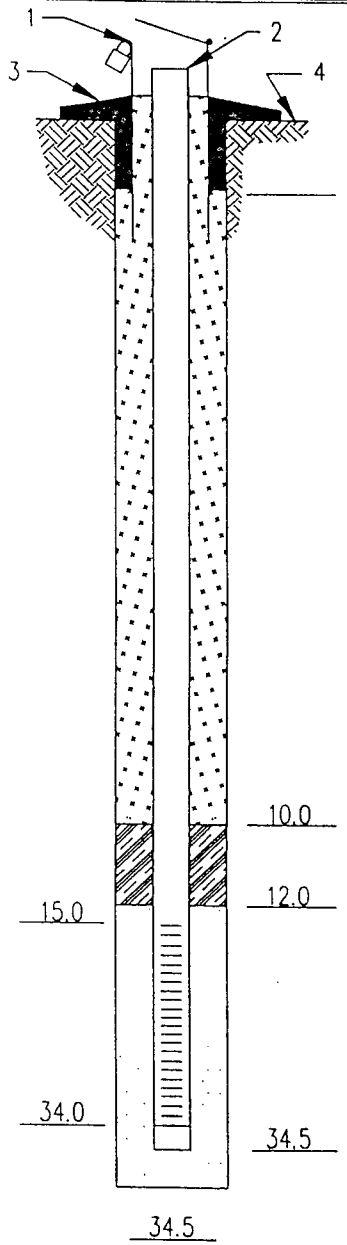
33-35' CLAYEY SAND, brown, moist.

TD = 34.5'

NOTE: 5 foot core barrel recovery system used as sampling technique

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Monitor Well ☒
Piezometer



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 3348.59 2 3348.39 3 3346.22 4 3345.8

Coordinates: X 3211.93 Y 6875.69

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: CSSI 16-40

Bentonite Seal: ☐ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☒ 1/4" Pellets ☐ _____

Grout Type: Portland Weight: _____

Bore Hole Diameter: 8"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: PRECISION ENGINEERING

Logged By: PHILIP CADARETTE

Completion Date: FEBRUARY 12, 1992

Date	D-T-W	MSL	Date	Field pH	Field EC
2/19/92	20.6	3327.79			
3/10/92	21.0	3327.39			

Comments: Concrete with 5% bentonite used to grout from seal to ground surface.

KWBES

KWB8

Project: 622092001-237 (KWB8)
Location: ARTESIA, NEW MEXICO

Sym	Samp	Loc	PI (ppm)	Depth (Feet)
				2
				4
				6
				8
				10
				12
				14
				16
				18
				20
				22
				24
				26
				28
				30
				32
				34
				36
				38
				40
				42
				44
				46
				48
				50

Geologic Description

0-22.5' SANDY CLAY, brown, dry, caliche nodules throughout, color lighter with depth, increasing sand content and caliche inclusions with depth white caliche banding starting at 10', thin gravel seam at 13', sandy clay exhibiting increasing moisture near 15'.

22.5-23' CLAYEY GRAVEL, saturated.

23-25' SILTY SAND, brown, saturated.

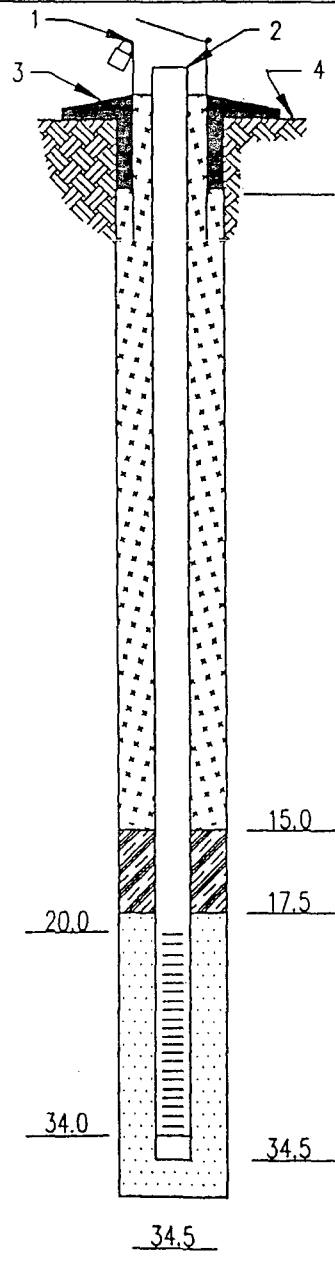
25-34.5' SANDY CLAY, brown, saturated to 26' then moist, dry near 34'.

TD = 34.5'

NOTE: 5 foot core barrel recovery system used as sampling technique

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Mon. Well ☒
Piezometer



Depths in Feet from Ground Surface (Not to Scale)

Design Specification

Elevations: (feet MSL) 1 3352.67 2 3352.53 3 3349.90 4 3349.8

Coordinates: X 1838.15 Y 6600.55

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ ____

Casing Diameter: ☒ 2" ☐ 3" ☐ 4" ☐ 6" ☐ ____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ ____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ ____

Sand Pack: CSSI 16-40

Bentonite Seal: ☐ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☒ 1/4" Pellets ☐ ____

Grout Type: Portland Weight: ____

Bore Hole Diameter: 8"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ ____

Drilled By: PRECISION ENGINEERING

Logged By: PHILIP CADARETTE

Completion Date: FEBRUARY 13, 1992

Date	D-T-W	MSL	Date	Field pH	Field EC
2/19/92	24.9	3327.6			
3/10/92	25.2	3327.3			

Comments: Concrete with 5% bentonite used to grout from seal to ground surface.

KWBES

Navajo

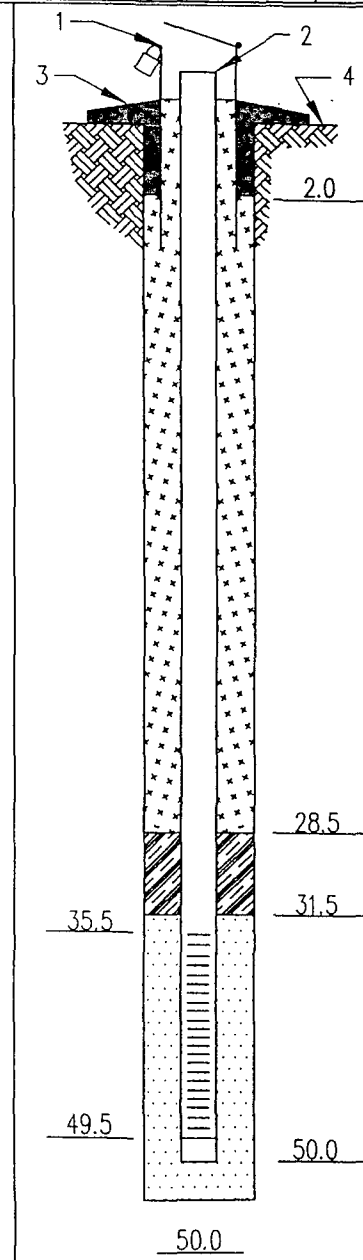
KWB9

Project: 622092001-237 (KWB9)
Location: ARTESIA, NEW MEXICO

Sym	Samp Loc	PID (Ppm)	(Feet)	Geologic Description
			2	0–10' SANDY CLAY, dark brown to brown, moist to slightly moist, plastic to friable. –hydrocarbon odor apparent at 8.0' –gray hydrocarbon staining apparent starting at 9.0'
			4	
			6	
			8	
			10	10–12' CLAY, gray hydrocarbon staining, strong odor, occasional pockets of fine sand, moist.
			12	
			14	12–20' SANDY CLAY, gray hydrocarbon staining, strong hydrocarbon odor, occasional pockets of fine sand, moist. –color darkens to black from 17–19.5' –saturated thin pebble seams at 17' and 18.5'. –hydrocarbon staining becomes lighter at 19.5'.
			16	
			18	
			20	
			22	
			24	20–29' CLAYEY SAND, gray hydrocarbon staining, strong odor, very moist to saturated at 25–28'.
			26	
			28	29–32' CLAY WITH SAND, light brown, slightly moist to dry, very stiff, no hydrocarbon staining or odor.
			30	
			32	32–45' SANDY CLAY, hydrocarbon starinin and strong odor, moist to saturated at 33 feet with thin gravel zone –saturated from 42.5–45.0'
			34	
			36	
			38	45–46' GRAVEL WITH SAND AND CLAY, saturated hydrocarbon staining and strong odor.
			40	
			42	46–50' SANDY CLAY, brown, slightly moist, stiff, no hydrocarbon stain or odor.
			44	
			46	TD = 50.0'
			48	CME 5' core barrel recovery system
			50	

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Monit Well ☒
Piezom er



Depths in Feet
from Ground Surface
(Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 _____ 2 _____ 3 _____ 4 _____

Coordinates: X _____ Y _____

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☐ 2" ☐ 3" ☒ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: Colorado Silica Sand 20/40

Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☐ 1/4" Pellets ☐ _____

Grout Type: Portland/5% Bentonite Weight: _____

Bore Hole Diameter: 13.5"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: Precision Engineering

Logged By: PWC

Completion Date: 10/02/92

Date	D–T–W	MSL	Date	Field pH	Field EC

Comments: 10" PVC casing grouted in from 0–30'. After curing, well completed.

KWBES

Navajo

KWB–10

Project: Navajo 622092003–236
Location: Artesia, New Mexico

Syn	Samp Loc	PID (ppm)	Depth (Feet)
			2
			4
			6
			8
			10
			12
			14
			16
			18
			20
			22
			24
			26
			28
			30
			32
			34
			36
			38
			40
			42
			44
			46
			48
			50

Geologic Description

0–10' CLAYEY SAND, dark brown to brown, moist to slightly miist, plastic to stiff.
–thin caliche pebble ozne @ 9.0', dry.

10–15' CLAY, brown to white, moist, blocky, gypsum crystals appearing near 15.0'.

15–25' CLAYEY SAND, brown to white, moist, plastic.
–saturated @ 20.5' with gravel and fine tan sand seams interbedded.

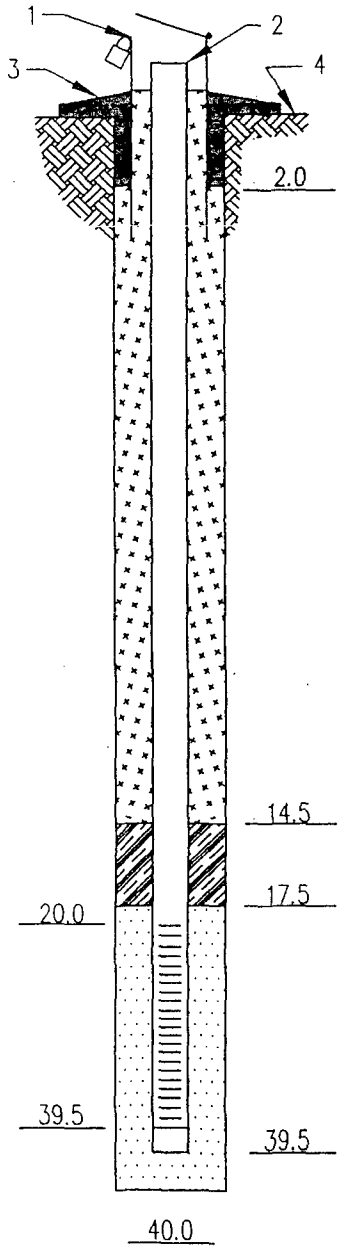
25–40' GRAVEL WITH CLAY AND SILT, saturated, gravel is calich with angular fragments up to 2" in size.

TD = 40.0'

CME 5' core barrel recovery system

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Monit. Well ☒
Piezometer



Depths in Feet
from Ground Surface
(Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 _____ 2 _____ 3 _____ 4 _____

Coordinates: X _____ Y _____

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☐ 2" ☐ 3" ☒ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: Colorado Silica Sand 20/40

Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☐ 1/4" Pellets ☐ _____

Grout Type: Portland/5% Bentonite Weight: _____

Bore Hole Diameter: 13.5"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: Precision Engineering

Logged By: PWC

Completion Date: 10/04/92

Date	D–T–W	MSL	Date	Field pH	Field EC

Comments: _____

KWBES

Navajo Nation

KWB–11A

Project: Navajo 622092003–236
Location: Artesia, New Mexico

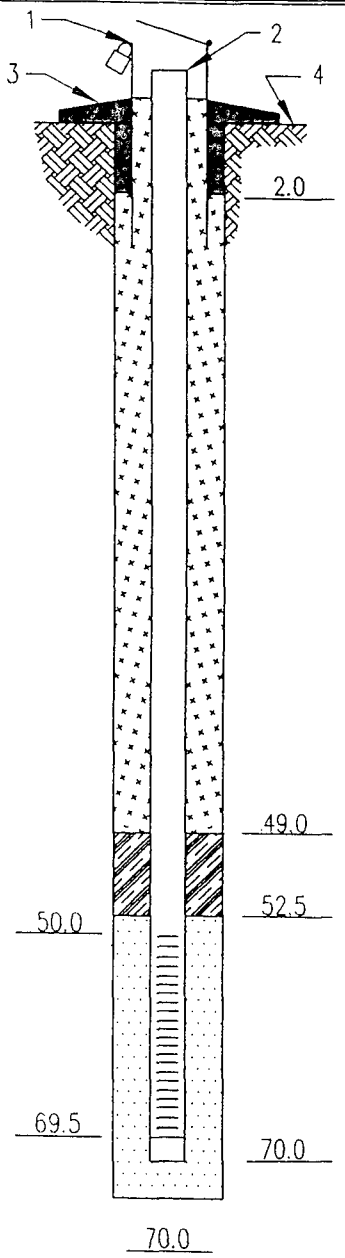
Syst	Samp Loc	PID (ppm)	(Feet)
			3
			6
			9
			12
			15
			18
			21
			24
			27
			30
			33
			36
			39
			42
			45
			48
			51
			54
			57
			60
			63
			66
			69
			72
			75

Geologic Description

0–10'	CLAYEY SAND, dark brown to brown, moist to slightly moist, plastiec to stiff. –thin caliche pebble zone @ 9.0', dry.
10–15'	CLAY, brown to white, moist, blocky, gypsum crystals appearing near 15.0'.
15–25'	CLAYEY SAND, brown to white, moist, plastic. –saturated at 20.5' with gravel and fine tan sand seams interbedded.
25–45'	GRAVEL WITH CLAY AND SILT, saturated, ravel is caliche with angular fragments up to 2" in size.
45–48.5'	RIVER ROCK, blue to gray, well rounded, saturated, 1/4" in diameter.
48.5–50'	SANDY CLAY, reddish brown, slightly moist, very stiff.
50–55'	CLAY WITH SAND, slightly moist to dry, very stiff, occassional rock fragments.
55–69'	CLAY, reddish brown, moist, plastic to stiff. –thin pebble beds, saturated, starting @ 58.0', occuring intermittently to 65.0'
69–70'	CLAY, reddish brown, moist to slightly, moist, very stiff.
	TD = 70.0'
	CME 5' core barrel recovery system

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Monitor Well ☒
Piezometer ☐



Depths in Feet
from Ground Surface
(Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 _____ 2 _____ 3 _____ 4 _____

Coordinates: X _____ Y _____

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☐ 2" ☐ 3" ☒ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: Colorado Silica Sand 20/40

Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☐ 1/4" Pellets ☐ _____

Grout Type: Portland/5% Bentonite Weight: _____

Bore Hole Diameter: 13.5"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: Precision Engineering

Logged By: PWC

Completion Date: 10/04/92

Date	D-T-W	MSL	Date	Field pH	Field EC

Comments: 10" PVC casing grouted in from 0–50.0' to seal off first saturated zone. After curing, well completed to 70.0'.

KWBES

Navajo

KWB–11B

Project: Navajo 622092003–236
Location: Artesia, New Mexico

Sym	Samp Loc	PID (ppm)	Det (Feet)
			2
			4
			6
			8
			10
			12
			14
			16
			18
			20
			22
			24
			26
			28
			30
			32
			34
			36
			38
			40
			42
			44
			46
			48
			50

Geologic Description

0–4' SANDY CLAY, dark brown to brown, moist, plastic.

4–10' CLAYEY SAND, brown to tan, moist, plastic, occasional gypsum crystals.

10–13' SANDY CLAY, moist, plastic, thin bands of fine sand interbedded.

13–15' CLAYEY SNAD, slightly moist, stiff.

15–20' CLAY WITH GRAVEL, sand and silt brown, moist, thin saturated gravel seam @ 18.0'.

20–22' GRAVEL WITH CLAY AND SAND, saturated.

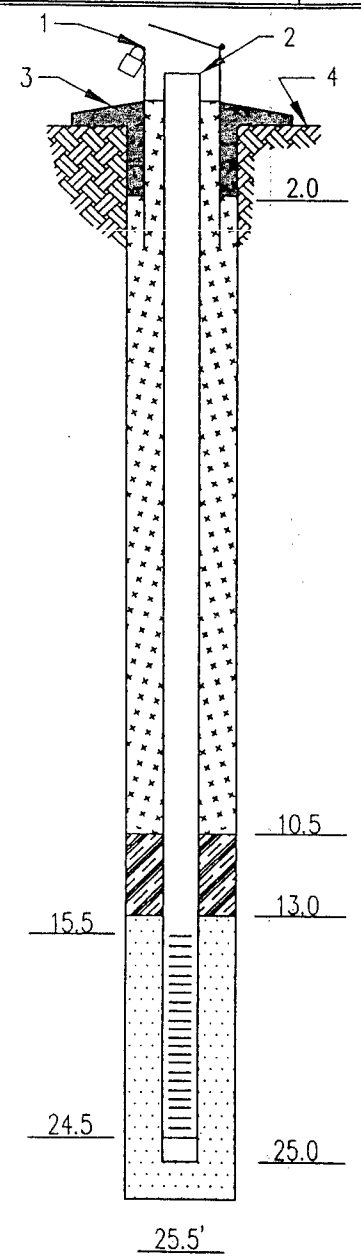
22–25' CLAY, brown, slightly moist, stiff.

TD = 25.0'

CME 5' foot core barrel recovery system

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Monitc Well ☒
Piezometer



Depths in Feet
from Ground Surface
(Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 _____ 2 _____ 3 _____ 4 _____

Coordinates: X _____ Y _____

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☐ 2" ☐ 3" ☒ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: Colorado Silica Sand 20/40

Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☐ 1/4" Pellets ☐ _____

Grout Type: Portland/5% Bentonite Weight: _____

Bore Hole Diameter: 13.5"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: Precision Engineering

Logged By: PWC

Completion Date: 10/04/92

Date	D-T-W	MSL	Date	Field pH	Field EC

Comments: _____

KWBES

Navajo

KWB-12A

Project: Navajo 622092003-236
Location: Artesia, New Mexico

Sym	Samp	Loc	PID (ppm)	(Feet)
				2
				4
				6
				8
				10
				12
				14
				16
				18
				20
				22
				24
				26
				28
				30
				32
				34
				36
				38
				40
				42
				44
				46
				48
				50

Geologic Description

0–4' SANDY CLAY, dark brown to brown, moist, plastic.

4–10' CLAYEY SAND, brown to tan, moist, plastic, occassional gypsum crystals.

10–13' SANDY CLAY, moist, plastic, thin bands of fine sand interbedded.

13–15' CLAYEY SAND, slightly moist, stiff.

15–20' CLAY, with gravel, sand, silt, brown, moist, thin saturated gravel seam @ 18.0'.

20–22' GRAVEL WITH CLAY AND SAND, saturated.

22–35' CLAY, brown, slightly moist, very stiff, occassional caliche rock fragments, dry.
–thin saturated seams of rock at 30.0', 32.0', 35.0'.

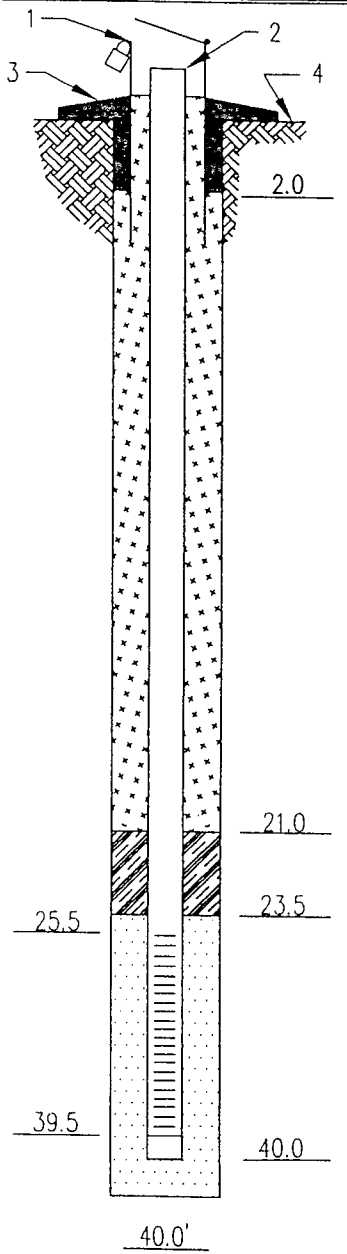
35–40' CLAY, reddish brown, moist with thin saturated caliche zones at 36.0' and 37.0'.
–slightly moist and stiff from 38–40.0'.

TD = 40.0'

CME 5' core barrel recovery system

ST=Shelby Tube | SS=Split Spoon | C=Cuttings

Monitor Well ☒
Piezometer



Depths in Feet from Ground Surface (Not to Scale)

Design Specifications

Elevations: (feet MSL) 1 _____ 2 _____ 3 _____ 4 _____

Coordinates: X _____ Y _____

Type of Casing: ☒ PVC Sched. 40 Flush Thread ☐ Stainless Steel ☐ _____

Casing Diameter: ☐ 2" ☐ 3" ☒ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: Colorado Silica Sand 20/40

Bentonite Seal: ☒ 1/2" Pellets ☐ Hole Plug ☐ Slurry ☐ 1/4" Pellets ☐ _____

Grout Type: Portland/5% Bentonite Weight: _____

Bore Hole Diameter: 13.5"

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: Precision Engineering

Logged By: PWC

Completion Date: 10/04/92

Date	D-T-W	MSL	Date	Field pH	Field EC

Comments: 10" PVC casing grouted in from 0–25.0' to seal off first saturated zone. After curing, well completed to 40.0'.

KWBES

Navajo

KWB–12B

Project: Navajo 622092003–236
Location: Artesia, New Mexico

LOG OF WELL RW-11-01 (BH-06-02)

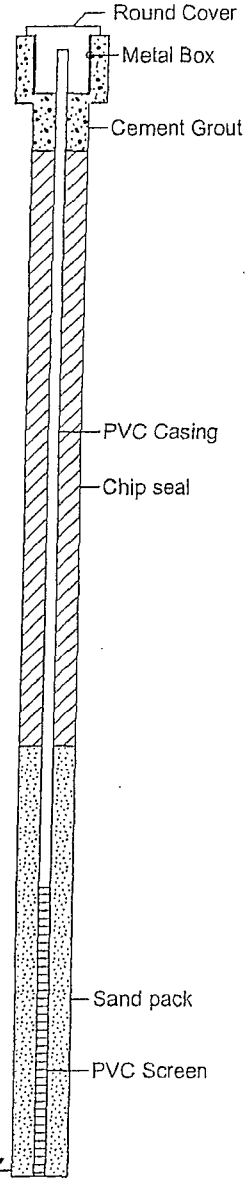
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 09/28/06; 1030	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 09/28/06; 1530	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0	ML		0-5 ft. SILT, very light brown, dry, no H/C stain or odor
5			5-10 ft. SILT, same as above
10			10-15 ft. SILT, gravelly, very light brown, small gravels to 1/2"
15	CL/CA		15-20 ft. Alternating zones of clay and caliche: Clay 0.6 ft., caliche rock 0.25 ft., clay 0.5 ft., caliche at base of core, hard, fractured, H/C odor
20			

Well: RW-11-01
Elev.:



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 35.15 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 20 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 15-35 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 2 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 3/8" chips
Seal placement	: 2 - 12.5 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: - -
Sand placement	: 12.5 - 32 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 32-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Set 20 ft. screen 15-35 ft., placed sand to 12.5-32 ft., placed bentonite to 2 ft, concrete to surface and pad.

ADDITIONAL INFORMATION:
On 09/29/06 DTW 19.66, Total Depth 35.15, slight odor, no product

Notes:
Borehole located S. of US 82 on Bolton Road, 30 ft. south of MW-57
Drilled as borehole BH-06-02
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-01 (BH-06-02)

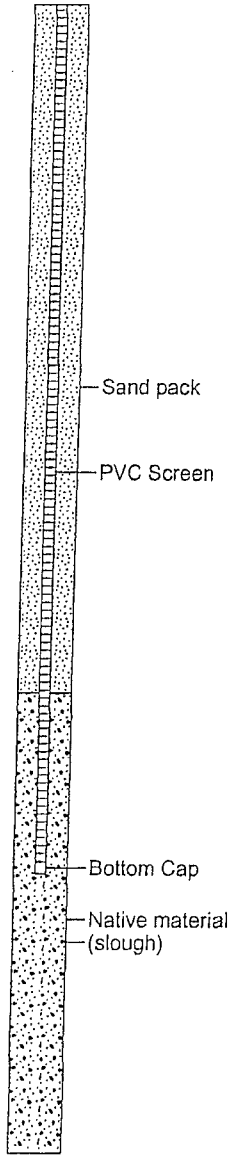
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 09/28/06; 1030	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 09/28/06; 1530	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-01
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
20	CL		20-20.9 ft. CLAY, brown, plastic, soft, H/C odor
			20.9-21.2 ft. CLAY, limey caliche clay, chalk white
			21.2-22.5 ft. CLAY, brown, soft, H/C odor
	CA		22.5-22.8 ft. CALICHE, chalk color
	CL		22.8-23.4 ft. CLAY, brown, same as above
	CL		23.4-23.7 ft. CALICHE, fractured and gravelly
	GP		23.7-24.1 ft. CLAY, brown, same as above
25			24.1-25 ft. GRAVEL, limey (caliche), hard, fractured, wet at base
	CL		25-26.4 ft. CLAY, chalky brown, dry
			26.4-27.1 ft. SILTY CLAY, soft, moist, H/C odor
			27.1-29.1 ft. CLAY, light brown, soft, plastic
	CA		29.1-29.4 ft. CALICHE, fractured, H/C odor
	CL		29.4-30 ft. CLAY, brown, wet
30	CA		(30-30.3 slough)
	CL		30.3-30.4 ft. CALICHE, chalky white, fractured, saturated
	CA		30.4-30.8 ft. CLAY, light brown, mottled
	CL		30.8-30.9 ft. CALICHE
			30.9-33.8 ft. CLAY, light brown, mottled
	CA		33.8-34.1 ft. CALICHE
	CL		34.1-34.9 ft. CLAY, light brown
35	CA		34.9-35 ft. CALICHE
			35-40 ft. No recovery, caliche rock in tip
	NR		
40			



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 35.15 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 20 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 15-35 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 2 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 3/8" chips
Seal placement	: 2 - 12.5 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: - -
Sand placement	: 12.5 - 32 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 32-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Set 20 ft. screen 15-35 ft., placed sand to 12.5-32 ft., placed bentonite to 2 ft, concrete to surface and pad.

ADDITIONAL INFORMATION:
On 09/29/06 DTW 19.66, Total Depth 35.15, slight odor, no product

Notes:
Borehole located S. of US 82 on Bolton Road, 30 ft. south of MW-57
Drilled as borehole BH-06-02
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-02 (BH-06-04)

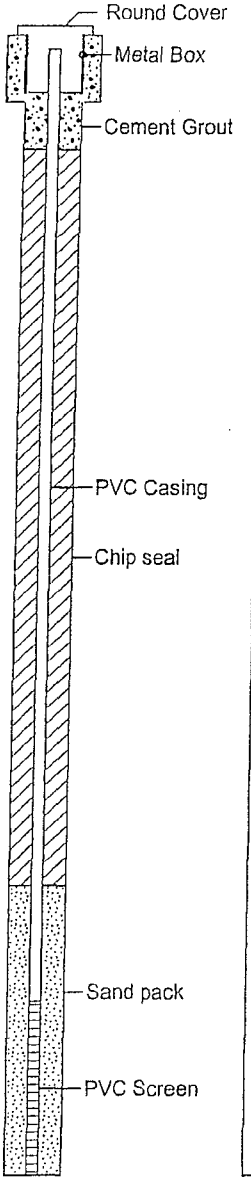
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 09/29/06; 1230	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 09/29/06; 1730	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ *Measured Water Level*

Well: RW-11-02
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0			0-5 ft. SANDY SILT, very light brown, dry
5	ML		5-10 ft. SANDY SILT, very light brown, dry
10			10-15 ft. GRAVELLY SILT, light brown, dry, caliche gravels to 3/4", angular
15	CA		15-15.1 ft. CALICHE, rock and slough
	CL		15.1-16.8 ft. CLAY, brown, dry, no H/C stain or odor
	CA		16.8- 17.1ft. CALICHE, limey white, hard, fractured
	CL		17.1-18.8 ft. CLAY, brown, dry, grading to SILTY CLAY at base, H/C odor
	CA		18.8-19.2 ft. CALICHE, fractured, wet, possible H/C saturation
20			



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 20 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	*: Concrete hand mix*
Cem't placement	: 0 - 2 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 3/8" chips
Seal placement	: 2 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: - -
Sand placement	: 15 - 32 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 32-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 2 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 20.16 ft., no product, no H/C odor, developed well with 12 vt. pump, water to sample trailer,

Notes:
Borehole located S. of US 82 on Bolton Road and 30 ft. north of MW-57.
Drilled as borehole BH-06-04
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-02 (BH-06-04)

Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 09/29/06; 1230	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 09/29/06; 1730	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-02
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
20	CL		20-20.8 ft. CLAY, brown, soft, strong H/C odor. 20.8-21.2 ft. SILTY CLAY, gray, strong H/C odor 21.2-24.1 ft. CLAY, mottled limey and brown, strong H/C odor 21.9-22.3 ft.
	CA		24.1-24.2 ft. CALICHE, rock jammed in tip
25	CL		25-25.2 ft. CLAY, gray-brown, silty, soft, H/C saturated
	CL		25.2-25.4 ft. CALICHE, fractured, H/C saturated
	CA/CL		25.4-26.2 ft. SILTY CLAY, gray-brown, soft, H/C odor, possible H/C saturation 26.2-27.2 ft. CLAY, brown, H/C odor 27.2-28.0 ft. CLAY with CALICHE, brown 28.0-28.9 ft. CLAYEY CALICHE, light brown, fractured
30	CL		30-31 ft. CLAY, very light brown, H/C odor 31-31.6 ft. GRAVELLY CLAY, gravels <1/4" 31.6 ft.-33.1 ft. CLAY, mottled brown-chalk color, no H/C odor 33.1-34.7 ft. GRAVELLY CLAY, brown, damp, no H/C odor
35	CL		35-40 ft. CLAY, brown, with occasional thin gravel lenses, no H/C odor
40			

Sand pack
PVC Screen
Bottom Cap
Native material (slough)

Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32 ft. Below TOC

CASING, SCREEN & CAP

Material, Joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 20 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: --

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 2 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 3/8" chips
Seal placement	: 2 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: --
Sand placement	: 15 - 32 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 32-40 ft.

ELEVATIONS

Ground elevation	: --
Inner casing, top	: --
Flush mount, top	: --

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 2 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 20.16 ft., no product, no H/C odor, developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 30 ft. north of MW-57.
Drilled as borehole BH-06-04
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-03 (BH-06-05)

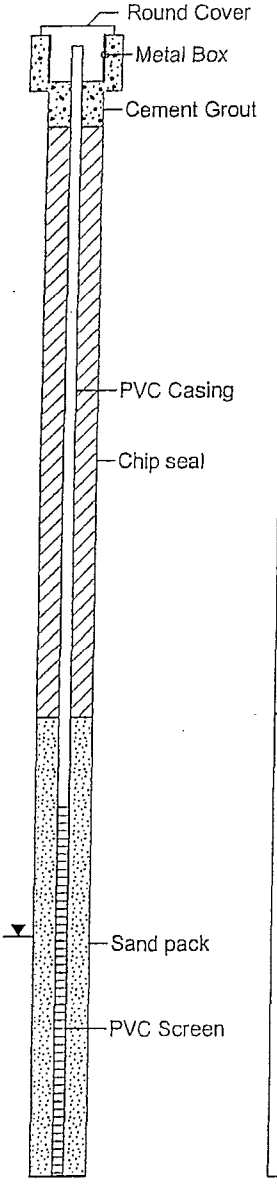
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/03/06; 1030	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/03/06; 1500	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-03
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0	ML		0-5 ft. SANDY SILT, very light brown, dry
5			5-10 ft. SANDY SILT, very light brown, dry
10			10-15 ft. GRAVELIY SILT, light brown, dry, caliche gravels to 3/4", angular
15	CA/CL		15-20 ft. CALICHE rock and CLAY mixed, clay brown, dry, hard, H/C odor at 20 ft.
20	CL/ML		20-20.4 ft. SILTY CLAY/CLAYEY SILT,
	CL		gray, plastic, with rounded caliche rock, strong H/C odor
	CL		20.4-21.2 SILTY CLAY, light brown, mottled, strong H/C odor
	CA		21.2-22.6 ft. CLAY, brown, dry, stiff, H/C odor
	CL		22.6-23.0 ft. CALICHE, white, soft, H/C odor
25			



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 2 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 7 bags 3/8" chips
Seal placement	: 2 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 11 bags
Sand placement	: 15 - 32 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 32-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 2 ft, concrete to surface and pad.

Notes:
Borehole located S. of US 82 on Bolton Road and 60 ft. north of MW-57.
Drilled as borehole BH-06-05
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-03 (BH-06-05)

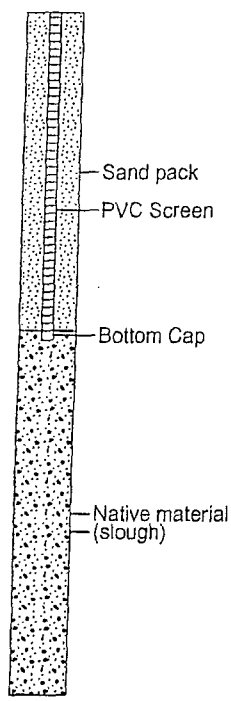
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/03/06; 1030	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/03/06; 1500	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-03
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
25	CL/CA		25-25.4 ft. CLAY and CALICHE, soft, saturated, H/C odor
	CA		25.4-25.7 ft. CALICHE, rock, hard, white to light brown, some cookines, H/C odor
	CL/CA		25.7-26.1 ft. CLAY and CALICHE, mottled brown and chalk white, H/C odor
	CL		26.1-28.2 ft. SILTY CLAY, light brown, occasionally mottled, thin zones of small, fractured caliche rock, H/C odor
30	CL		30-32.4 ft. CLAY, brown, with occasional gravel, no H/C odor
	CA		32.4-33.7 ft. CALICHE, rock, hard, unfractured.
	CL		33.7-34.1 ft. GRAVELLY CLAY, brown, semi-saturated, no H/C odor
35	CL		34.1-34.7 ft. CLAY, brown, no H/C odor
	CL		35-36.3 ft. CLAY, brown, stiff 36.3-36.8 ft. CLAY, mottled 36.8-38.1 ft. CLAY, brown, occasional caliche gravel
	CL/CA		38.1-39.1 ft. CALICHE and CLAY, caliche brown, fractured, saturated, no H/C odor
	CL		
40	CA		39.1-39.6 ft. CLAY, brown, occasional gravel to 3/4 in.
			39.6-39.9 ft. CALICHE, rock, fractured
45			
50			



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: --

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 2 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 7 bags 3/8" chips
Seal placement	: 2 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 11 bags
Sand placement	: 15 - 32 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 32-40 ft.

ELEVATIONS

Ground elevation	: --
Inner casing, top	: --
Flush mount, top	: --

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 2 ft, concrete to surface and pad.

Notes:
Borehole located S. of US 82 on Bolton Road and 60 ft. north of MW-57.
Drilled as borehole BH-06-05
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-04 (BH-06-06)

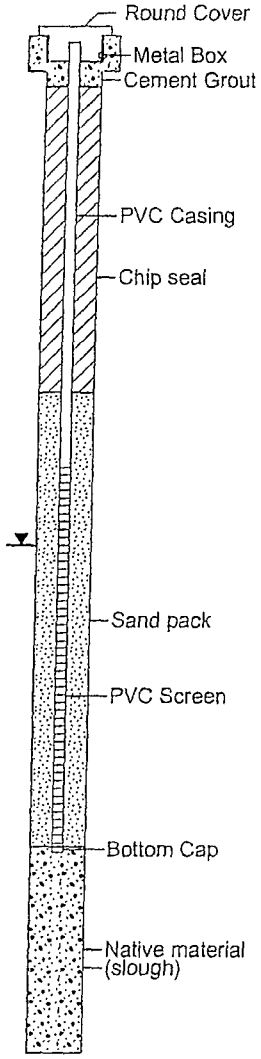
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/04/06; 0900	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/04/06; 1300	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-04
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0	ML		0-5 ft. SILT, very light brown, sandy, dry, no H/C stain or odor
5	SM		5-10 ft. CLAYEY SILTY SAND, light brown, dry, no H/C stain or odor
10	CL		10-15 ft. SANDY SILTY CLAY, light brown, dry, no H/C stain or odor
15	CA		15-15.5 ft. light brown, soft, 15.5-16.2 ft. CALICHE, white, some clay
	CL		16.2-18.9 ft. CLAY, brown, dry, no H/C stain or odor
	CA		
20	CL		18.9-19.3 ft. CALICHE, rock, gray, dry, strong H/C odor
	SM/CL		19.3-19.9 ft. CLAY, brown, some caliche inclusions, dry, H/C odor
	CL		
	ML		20.0-20.4 ft. CLAY, brown, as above
25	CA		20.4-22.2 ft. CLAYEY SILT/SILTY CLAY, gray, damp, very strong H/C odor
	CL		22.2-23.4 ft. CLAY, brown with gray zones, H/C staining and odor
			23.4-23.8 ft. CLAYEY SILT, brown
30	CL		23.8-24.3 ft. CALICHE, fractured rock, H2O saturated. 25-25.3 ft. CALICHE, fractured rock and gravels, saturated
			25.3-27.4 ft. CLAY, silty, brown, soft, strong H/C odor (product on barrel)
35	CL		(30-30.2 ft. slough) 30.2-31.7 ft. CLAY, brown, plastic, slight H/C odor
			31.7-35 ft. CLAY, brown, hard, dry, no H/C odor
40			35-40 ft. SILTY CLAY, brown, soft, plastic, saturated H2O in spots, occasional caliche gravels, possible H/C odor (from above?).
45			



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 2 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 5 bags 3/8" chips
Seal placement	: 1.5 - 14 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 16 bags
Sand placement	: 14 - 32 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 32-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Set 15 ft. screen 17-32 ft., placed sand to 14-32 ft., placed bentonite to 1.5 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.83 ft., no product, H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 90 ft. north of MW-57.
Drilled as borehole BH-06-06
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-05 (BH-06-07)

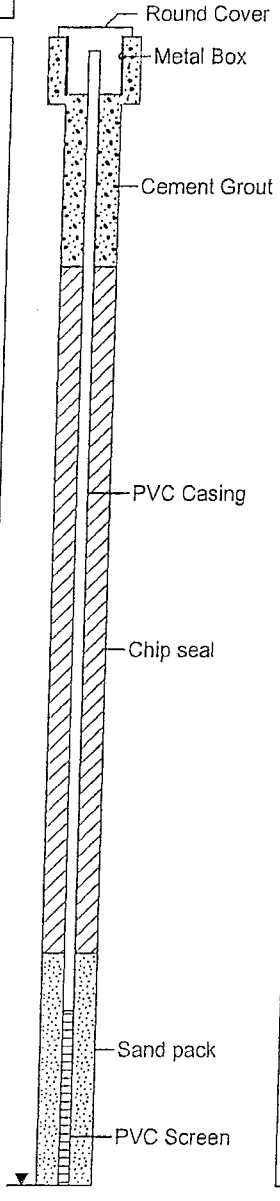
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/05/06; 0900	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/05/06; 1330	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0	ML		0-5 ft. SILT, very light brown, sandy, dry, no H/C stain or odor
5	SM		5-10 ft. CLAYEY SILTY SAND, light brown, dry, no H/C stain or odor
10	CL		10-15 ft. SANDY SILTY CLAY, light brown, dry, no H/C stain or odor
15	CL/CA		15-20 ft.CLAY and CALICHE, mixture, brown and white, no distinct zones (gravelly clay?), bottom 8 in. gray with H/C odor
20			

Well: RW-11-05
Elev.:



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 4 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 5 bags 3/8" chips
Seal placement	: 4 - 16 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 13 bags
Sand placement	: 16 - 33 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 33-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 33 ft., placed one bag sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 16-32 ft., placed bentonite to 4 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.76 ft., no product, H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 120 ft. north of MW-57.
Drilled as borehole BH-06-07
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-05 (BH-06-07)

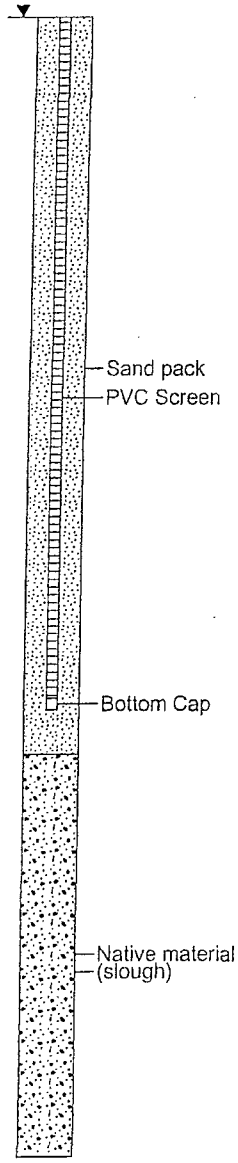
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/05/06; 0900	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/05/06; 1330	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Forernost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-05
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
20	CL		20-20.4 ft. CLAY, brown
	CA		20.4-21 ft. CLAYEY CALICHE, gray, H/C saturated
	CL		21-22.2 ft. CLAY, brown, H/C odor 22.2-23.7 ft. CLAY, gray, soft, H/C odor
	CA		23.7-24.0 ft. CALICHE, light brown, fractured, H/C saturated
25	CL		24.0-24.6 ft. CLAY, brown, plastic (25.0-25.3 ft. slough) 25.3-26.7 ft. CLAY, mottled, soft, H/C odor
	CL		26.7-27.2 ft. CLAY, with caliche, gray
	CA		27.2-27.6 ft. CALICHE, rock, fractured, water and hydrocarbon saturated
	CL		27.6-29.8 ft. CLAY, brown, very plastic, dry (30-30.3 slough)
30	CL		30.3-33.5 ft. CLAY, light brown, stiff, some silt, uniform
	CL		33.5-34.9 ft. SILTY CLAY, with caliche, brown, damp
35	CL		(35-35.3 slough) 35.3-36.1 ft. CLAY, brown, with small, very light brown caliche gravels
	CL		36.1-36.3 ft. CLAY, with caliche, very light brown
	CL		36.3-40 ft. CLAY, light brown, plastic, some silt, very stiff,
40			



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 4 ft. BLS
Annular seal type	: Hole Plug Bentonite.
Seal volume	: 5 bags 3/8" chips
Seal placement	: 4 - 16 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 13 bags
Sand placement	: 16 - 33 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 33-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 33 ft., placed one bag sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 16-32 ft., placed bentonite to 4 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.76 ft., no product, H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 120 ft. north of MW-57.
Drilled as borehole BH-06-07
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-06 (BH-06-08)

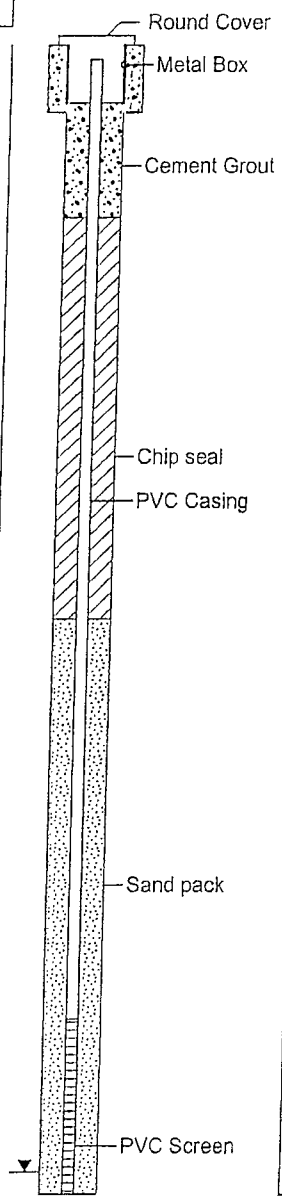
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/09/06; 1000	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/09/06; 1400	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-06
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0	ML		0-5 ft. SILT, light brown, sandy, dry, no H/C stain or odor
5	ML/CL		5-15 ft. CLAYEY SILT grading to SILTY CLAY, brown, dry, plastic (little clay balls), no H/C stain or odor
15	ML		15-15.9 ft. SANDY SILT, light brown with yellow-orange streaks, no H/C stain or odor
	SW/GW		15.9-16.2 ft. SAND with CALICHE GRAVEL, light brown, well graded (non-uniform), no H/C stain or odor
	GC		16.2-16.5 ft. CLAY and CALICHE GRAVEL, dry, silty
	SW/GW		SAND and CALICHE GRAVEL (gravelly sand), dry, no H/C stain or odor
	CA/CL		17.1-17.7 ft. CALICHE and CLAY, light brown, dry, no H/C stain or odor
20			17.7-18.4 ft. CALICHE and CLAY, gray, H/C odor



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 3 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 4 bags 3/8" chips
Seal placement	: 3 - 10 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 18 bags
Sand placement	: 10 - 36 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 36-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 36 ft., placed six bags sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 10-32 ft., placed bentonite to 3 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.38 ft., no product, H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 150 ft. north of MW-57.
Drilled as borehole BH-06-08
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-06 (BH-06-08)

Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/09/06; 1000	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/09/06; 1400	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-06
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
20	SC		20-20.3 ft. CLAYEY SAND, brown and gray, dry, H/C odor
	ML		20.3-21.2 ft. CLAYEY SILT, brown and mottled chalky, dry, H/C odor
	CL		21.2-23.6 ft. SILTY CLAY, brown, dry, H/C odor
	CL		23.6-24.0 ft. CALICHE CLAY, gray and brown, some saturation, H/C odor
	CA		24-25 ft. CLAYEY CALICHE, caliche rock, fractured, gray, water and product saturated
25	CA		25-26.9 ft. SANDY, CLAYEY CALICHE, light brown, some gray, water and product saturated
	CL		26.9-28.6 ft. SILTY CLAY, brown, damp, H/C odor
	CA		28.6-28.9 ft. CLAYEY CALICHE, very light brown (chalk color), water saturated
	CL		28.9-30 ft. SILTY CLAY, brown, possible H/C odor
30	CL		30-30.8 ft. CLAY, mottled brown and chalky, dry
	CL/CA		30.8-31.1 ft. CALICHE CLAY, very light brown, water saturated
	CL		31.1-32.3 ft. CLAY, brown, plastic, very stiff, little or no H/C odor
	GW		32.3-32.9 ft. CALICHE GRAVEL, small fragments and clay, brown, wet
35	CL		32.9-35 ft. CLAY, light brown, plastic 35-38 ft. light brown, plastic, very stiff, ocassional gravel and water saturation, no H/C odor
	CL		38-39.2 ft. GRAVELLY CLAY, brown, clay with very small caliche gravels, 1/8-1/4 in., no H/C stain or odor
	CL		39.2-40 ft. CLAY, light brown, soft, plastic, dry, no H/C stain or odor
40			

PVC Screen
Sand pack
Bottom Cap
Native material (slough)

Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 3 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 4 bags 3/8" chips
Seal placement	: 3 - 10 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 18 bags
Sand placement	: 10 - 36 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 36-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 36 ft., placed six bags sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 10-32 ft., placed bentonite to 3 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.38 ft., no product, H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 150 ft. north of MW-57.
Drilled as borehole BH-06-08
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-07 (BH-06-09)

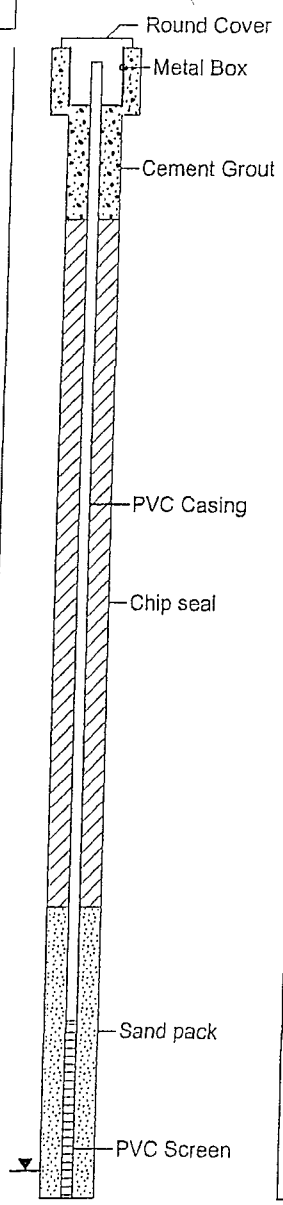
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/10/06; 0830	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/10/06; 1330	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0	ML		0-5 ft. SILT, light brown, sandy, dry, no H/C stain or odor
5	ML/CL		5-15 ft. CLAYEY SILT grading to SILTY CLAY, brown, dry, plastic (little clay balls), no H/C stain or odor
15	CL		15-16 ft. SILTY CLAY, light brown with rust staining, dry, no H/C stain or odor
	SP/GP		16-17 ft. GRAVELLY CLAYEY SAND, light brown, very fine grained, limestone gravels to 1 in.
	CL		17-18 ft. GRAVELLY CLAY, clay light brown, abundant gravels to 1"
	CA		18-18.2 ft. CALICHE, rock in tip
20			

Well: RW-11-07
Elev.:



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 3 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 6 bags 3/8" chips
Seal placement	: 3 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 13 bags
Sand placement	: 15 - 33 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 33-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 33 ft., placed one bag sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 3 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.30 ft., no product, H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 180 ft. north of MW-57.
Drilled as borehole BH-06-09
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-07 (BH-06-09)

Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/10/06; 0830	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/10/06; 1330	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Well: RW-11-07
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
20	CL		20-20.8 ft. CLAY, brown, dry, occasional gravel, slight H/C odor
	CA		20.8-21.3 ft. CALICHE, rock and gravels in clay matrix, light gray to chalk color, strong H/C odor
	CL		21.3-21.6 ft. SILTY CLAY, brown, damp, H/C odor
	CL		21.6-22 ft. GRAVELLY CLAY, gravel in clay matrix, light brown, damp, H/C odor
			22-23 ft. CLAY, brown, stiff, slight H/C odor
25			25-27.3 ft. CLAY, brown, soft, damp, slight or no H/C odor
			27.3-28.5 ft. LIMEY CLAY, chalk color, soft, very plastic, damp, no H/C stain or odor
30			30-31.5 ft. CLAY, brown, plastic, damp, no H/C stain or odor
	CL		31.5-31.7 ft. CLAY, limey, very light brown, soft, plastic
			31.7-33.7 ft. CLAY, brown, soft, plastic, sticky, silty from 31.7-32.5 ft., slight H/C odor
35			35-40 ft. CLAY, light brown to brown, mottled in places, hard and stiff to soft and damp. Caliche rock at 35.5 and 37.3 ft. no H/C odor
40			

Sand pack
PVC Screen
Bottom Cap
Native material (slough)

Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 3 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 6 bags 3/8" chips
Seal placement	: 3 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 13 bags
Sand placement	: 15 - 33 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 33-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 33 ft., placed one bag sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 3 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.30 ft., no product, H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 180 ft. north of MW-57.
Drilled as borehole BH-06-09
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-08 (BH-06-10)

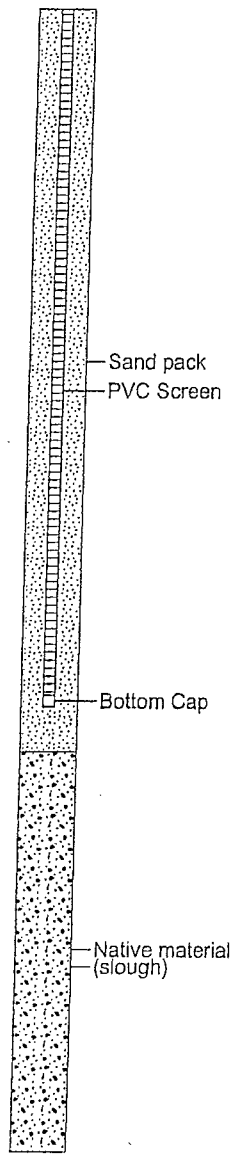
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/11/06; 0900	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/11/06; 1300	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Well: RW-11-08
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
20	GC		
	CL		20.4-21.3 ft. SILTY CLAY, brown, strong H/C odor
	CA		21.3-21.5 ft. CALICHE rock
	CL		21.5-22.3 ft. CLAY, brown, some silt and very fine grained sand, soft, H/C odor
	CA		22.3-22.7 ft. CALICHE rock with clay
	CL		22.7-23.5 ft. CLAY, mottled, with thin caliche lens, strong H/C product odor
	CL/CA		23.5-24.2 ft. CLAY and CALICHE rock, saturated, show of H/C product, H/C odor
25	CL		25.3-26.5 ft. SILTY CLAY, brown, soft, occasional caliche gravel, H/C odor
	CA		26.5-26.8 ft. CALICHE rock with clay matrix, very light brown, H/C odor
	CL		26.8-28.2 ft. CLAY, brown, soft, occasional caliche gravel, H/C odor
	CA		28.2-28.4 ft. CALICHE rock with clay matrix, very light brown, H/C odor
	CL		28.4-28.7 ft. CLAY, brown, soft, occasional caliche gravel, H/C odor
30			30-30.9 ft. CLAY, brown, soft, possible H/C odor
	CA		30.9-31.2 ft. CALICHE rock in clay matrix
	CL		31.2-34.2 ft. CLAY, limey, very light brown, soft, with occasional small gravel, no H/C stain or odor
			34.2-34.7 ft. CLAY, brown, some mottling
35	GC		35-35.6 ft. GRAVELLY CLAY, gray, H/C odor
	CL		35.6-36.9 ft. SANDY CLAY, light brown, very fine grained sand, water saturated
	CL		36.9-38.1 ft. CLAY, brown, soft, occasional small gravel, possible H/C odor
	CA		38.1-38.4 ft. CALICHE rock, fractured, water saturated, possible H/C odor (from water in core barrel?)
	CL		38.4-39.5 ft. CLAY, light brown, very plastic, damp, possible odor (as above)
40	GW		39.5-40 ft. CALICHE GRAVEL, saturated



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 3 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 6 bags 3/8" chips
Seal placement	: 3 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 13 bags
Sand placement	: 15 - 33 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 33-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 33 ft., placed one bag sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 3 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.64 ft., no product, no H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 210 ft. north of MW-57.
Drilled as borehole BH-06-10
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-08 (BH-06-10)

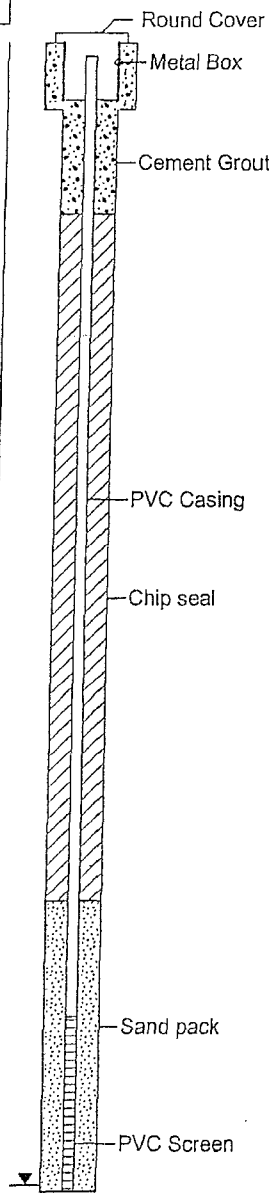
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/11/06; 0900	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/11/06; 1300	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0	ML		0-5 ft. SILT, light brown, sandy, dry, no H/C stain or odor
5	ML/CL		5-15 ft. CLAYEY SILT grading to SILTY CLAY, brown, dry, plastic (little clay balls), no H/C stain or odor
15	CL		15-17.2 ft. SANDY CLAY, light brown with rust staining, black with septic odor at 17.2 ft., dry
	GC		17.2-18.2 ft. SANDY CLAYEY GRAVEL, light brown, caliche gravel and fragments, dry, no H/C odor 18.2-19 ft. SANDY CLAYEY GRAVEL mix, light brown to brown, dry, no H/C odor 20-20.4 ft. SANDY CLAYEY GRAVEL mix, brown-gray-black
20			

Well: RW-11-08
Elev.:



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 In. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 3 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 6 bags 3/8" chips
Seal placement	: 3 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 13 bags
Sand placement	: 15 - 33 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 33-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 33 ft., placed one bag sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 3 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.64 ft., no product, no H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 210 ft. north of MW-57.
Drilled as borehole BH-06-10
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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