

FIELD LOG OF BORING

PROJECT NO. 74 OLB
DATE 10-12 TITLE SUN Phillips Soud
START 10-11-74 COMPLETE _____
EQUIPMENT USED WIRE LINE TESTER
PAULINE

BORING NO. P-3 CORRE _____
ELEVATION _____ DATUM _____
WATER LEVEL _____ AFTER _____
LOGGED BY M TURNER

Page I A

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
0-13	1	AIR ROTARY		CHIPS	SAND & GRAVEL, ALLUVIAL AND COLLUVIAL DEPOSITS	SOLID BEDROCK AT 13 FEET
20-25	2	AIR ROTARY		CHIPS	SANDSTONE, LIGHT BROWN, VERY FINE GRAIN TO FINE GRAIN MODERATELY HARD TO HARD FAINTLY LAMINATED	
25-30	3	AIR ROTARY		CHIPS	SILTSTONE, GRAY, HARD TO VERY HARD, VERY CALCAREOUS	
30-35		AIR ROTARY		CHIPS	SAME AS ABOVE	
35-40	4	AIR ROTARY		CHIPS	SILTSTONE, GRAY TO DARK GRAY HARD TO VERY HARD, VERY CALCAREOUS, SLIGHTLY MICACEOUS FAINTLY LAMINATED	
40-45	5	AIR ROTARY		CHIPS	SANDSTONE, VERY FINE GRAIN TO FINE GRAIN, LIGHT BROWN AND LIGHT GRAY CHIPS, MOD. HARD TO HARD	

NOTES:

turner

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3 CORE HOLE

DATE 10-12 TITLE SUN PHILLIPS SCHIO OIL

ELEVATION _____ DATUM _____

START 10-11-74 COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE WESTERN - FALING

LOGGED BY MATTHEW TURNER

PAGE I B

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
45-50	6	AIR ROTARY		CHIPS	SILTSTONE, GREY TO DARK GREY, HARD TO VERY HARD, FAINTLY LAMINATED, VERY CALCAREOUS	
50-55	7	AIR ROTARY		CHIPS	SANDSTONE, MIXED LITHOLOGY. SILTSTONE LIGHT GREY SANDSTONE, MEDIUM GRAIN, BIOTITE, WELL SORTED LIGHT GREY SILTSTONE, FAINTLY LAMINATED	
55-60	8	AIR ROTARY		CHIPS	SILTSTONE, LIGHT GREY & DARK GREY BLACK, MOD. HARD TO HARD, FAINTLY LAMINATED, ORGANIC REMAINS	
60-65	9	AIR ROTARY		CHIPS	SILTSTONE, LIGHT GRAY, HARD TO VERY HARD	
65-70	10	AIR ROTARY		CHIPS	SILTSTONE, BROWN, HARD	END AIR ROTARY 70'

NOTES:

turner

FIELD LOG OF BORING

PROJECT NO. 74-06B

BORING NO. P-3 CORE

DATE 10/18/74 TITLE SUN-PHILLIPS - SONIO

ELEVATION _____ DATUM _____

START 10/18/74 COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FALING 2500
6 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY W. R. LUND

pg I C

DEPTH	ROD SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
68.85-69.55	RUN 1	3' CORE	100	100%	Quartz Wacke; 2.5YR 4/0 gray, fine to v. fine, subrounded to rounded, poorly sorted gtz. grains in a 10-20% matrix of silt size material, trace feldspar, 5-7% v. fine grained biotite & muscovite, noncalc., mod. hard to hard, nonfractured, nonapparent fossils, bedding in distinct - pass. massive.	
69.55-70.13				100%	Sandy Siltstone; 5Y 5/1 gray, mixture of v. fine sand & silt = 40-60, poorly sorted; sand predominantly rounded v. fine gtz. grains w/ occ. biotite & muscovite, noncalc, med. bedded, mod. hard, horizontal parting planes at 69.55' & 69.82' - faces smooth & no coatings, nonfossiliferous.	
70.13-83.85			100%	100%	Quartz Wacke - Feldspathic Quartz Wacke; 5Y 5/1 gray to 7.5N 4 gray, v. fine to med. grained, subrounded to rounded, poorly sorted gtz. grains, w/ 3-5% platy muscovite & biotite and 5-12%	

NOTES:

fuaro

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/18/74 TITLE SUN-PHILLIPS-SONIO

ELEVATION _____ DATUM _____

START 10/18/74 COMPLETE

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE WESTERN FALING 2500

LOGGED BY W. R. Lund

69 66 3/4" DIAMOND BIT, POTRY/AIR
9.12 5.25
21.77 74.30

P-21

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:		
						subangular feldspar w/ a silt matrix ranging from $\approx 10-25\%$, $\approx 3\%$ accessory minerals, noncalc. to silt. calc., med. bedded though locally thinly bedded. showing graded bedding and aa. disturbed beds, parting planes at 72.8', 73.8', 74.2', 74.9', 75.7', 77.0', 78.1' 80.3' fossils scattered throughout & locally v. abundant, mostly carbonitized plant matter i.e. leaves, twigs & gen. hash - core gritty to feel.	
83.85-	Run		100%	100%		Same as above	
86.36	2						
86.36 -			100%	100%		Sandstone: light grey (N7)	
87.57						moderately hard, fine-grained poorly sorted, massive, moderately calcareous, non fractured, non-fossiliferous some organic stringers (almost pure to effaceous material)	

NOTES:

funny

BORING NO. D-3

ELEVATION _____ DATUM _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LW Air Rotary Filing ²⁵⁰⁰ LOGGED BY M. Siembieda

RGD

p. 3

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
87.57 -			100	100	Sandstone, med. un. grey (N5)	
88.80					(salt + Pepper), med. un. - grained, massive, moderately hard, moderately poorly sorted, very slightly calcareous some organics and possible quartz, non-fractured, non- fossiliferous	
88.80 →			100	100	Sandstone, light grey (N7) to	
89.64					Med. dark grey (N4) soft to moderately hard, graded (very-fine grained at top to med. grain at bottom) moderately sorted, very slightly calcareous, generally massive. Non-fractured, non-fossiliferous. some organic stringers, possible quartz and mica (biotite?)	

NOTES:

Futuro

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/19/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary Drilling 2500

LOGGED BY M. Siembieda

P. A.

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
89.64' → 110.75	2 ^{co} +		100	100	Sands tone: light grey (N7) to Medion dark grey (N4) (salt + pepper) soft to moderately hard, fine- grained to medion grained, moderately sorted, generally massive with some local bedding, non-calcareous to slightly calcareous, some ^{slightly} evaporous layers with H ₂ S gas(?), some organic stringers, with areas of high concentrations 98.00 → 98.80 104.00 → 105.20 (inclined bedding at this interval) and 108.8 - 108.9. non-fractured, non-fossiliferous. sandstone contains, quartz mica, tuffaceous material	
110.75 115.18			70	100	Siltstone: light grey (N7) to medion grey (N5) [with some hues of red, green and blue] soft to moderately hard	

NOTES:

fuero

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/19/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary Drilling 2500

LOGGED BY M. Siembieda

RQD

P4-B

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows Force	Recovery, Condition		
110.75 →					Thin-bedded, slightly calcareous	
115.18					to non-calcareous. Possible	
cont					Parting Planes at 111.15' and	
					112.85' with rubble zone (joints?)	
					From 114 → 115.18. possible	
					mica and/or pyrite present	
115.18 →	3		100	100	Siltstone grading in and out	
143					to a very-fine sandstone	
					light grey (N7) to medium grey (5)	
					(slight greenish tint), generally	
					hard with some slightly	
					softer zones, moderately	
					sorted, slightly calcareous	
					(upper zone) to non-calcareous	
					(lower zone), bedding ranges	
					from massive to very thinly	
					bedded, some differential	
					compaction and tilted	
					bedding, non-fossiliferous.	
					A zone of interbedded fine	

NOTES:

frano

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. D-3

DATE 10/11/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary Failing 2560

LOGGED BY M. Siembicki

• P5.

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
115.18 143 cont'	3				sands and siltstones occurs between 137→139. Joint occurs between 124.95 to 125.70, it is smooth and slightly curved. Some pyrite and gilsonite occurs. Parting planes occur at 116.36, 118.32, 120.73, 123.23, 124.95, 125.70, 127.91, 130.18	
143-173	4		92	100	Siltstones and Very-fine grained sandstone (becoming less sandy at depth) light grey (N7) to brownish grey (5YR 4/1) moderately hard to hard, medium grained to silt, generally massive with some bedding, moderately sorted, locally poorly sorted, some organic stringers, minor amounts of pyrite, gilsonite, possibly	

NOTES:

7-23-73 L-013

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/17/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W - Air Rotare Filling 2500

LOGGED BY M. Siembieda

D-6

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
143-173	4				^{+Quartz} Mica. non-calcareous,	
cont					non-fossiliferous , non-fossiliferous	
					some differential compaction	
					where bedding is observable.	
					Parting planes at 145.10,	
					148.10, 152.00, 157.14	
					159.43, 163.43, 168.45	
					Rubble zone occurs between	
					171.3 → 173. possible do to	
					Jointing	
<u>10/20/74 W. E. LUND</u>						
173-185.7	5	3" CURR		100%	SLTSTONE; dk. yellowish brn. 10YR 4/2,	
					90%+ grains silt or below, well-sorted,	
					calc. for silt. calc. (decreasing w/ depth)	
					bedding poorly defined, massive,	
					mod. hard to hard, silt. petrolicious,	
					locally micaceous, rubble zone at	
					175.6' w/ hackly fractures, horizontal	
					parting planes at 182.25', 185.5', &	
					185.7', abundant carbonitized plant hash	

NOTES:

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FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/20/74 TITLE SUN-PHILLIPS-SOHIO

ELEVATION _____ DATUM _____

START 00:00 COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FAILING
2500, 6 3/4 DIAMOND BIT,
ROTARY AIR

LOGGED BY W.R. LUND - J. CRANOR
P. 7.

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
185.7' - 186.4'	S	3" CORE	100%	100%	Tuff - Tuffaceous Siltstone; mod. yellow brn. 10YR 5/4, 90% silt or below, well sorted, silt. to mod. calc., laminated - distorted & interliners w/ silt stone above, hard, upper contact marked by an inclined frac. - frac changes inclination from $\approx 25^\circ$ to $\approx 85^\circ$ - face rough - non coated, nonfossiliferous.	
186.4' - 188.9'	S	3" CORE	100%	100%	Siltstone; dk. yellow brn. 10YR 4/2, 90% grains silt or below, well sorted, silt. calc., bedding poorly defined, hard, occ. v. small particles plant remains.	
188.9' - 189.2'	S	3" CORE	100%	100%	Interbedded Tuff & Siltstone; dk. yell. brn. 10YR 4/2 to mod. yell. brn. 10YR 5/4, 90% silt or below, well sorted, calc., crudly bedded - v. irregular (differential compaction?), hard, nonfossiliferous.	
189.2' - 191.3'	S	3" CORE	100%	100%	Siltstone; lt gray N-7 to med lt. gray N-6, 90% silt or below, well sorted, silt. calc.	

NOTES:

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FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/20/74 TITLE SUN. PHILLIPS-SONHO

ELEVATION _____ DATUM _____

START 00:00 COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FALING 2500
6 3/4" DIAMOND BIT, ROTARY AIR

LOGGED BY W. R. Lund & J. Cranor

P 8

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						bedding indist. - massive, mod. hard to hard, occ. thin < 1/2" irregular packets of tuffaceous material 10 YR 5/4, fractures at 188.2' 10°, 189.7' 70°, 190.4' 75°, 191.6' 50°, fracture faces are irregular & locally have calcite coatings, occ. v. fine plant remains. last .5' 3 heeled frag. at 30°, 50°, 80°	
191.8 - 193.2	5	3" CORE	100%	100%		Interbedded Tuffs & siltstones; mod. lt. gray N-7 to grayish orange pink 5YR 7/6, 90% silt or below, well sorted, silt. calc. laminated to v. thinly bedded - v. irregular "wavy", hard (silicious?), fracture at 192.25' at 70° face clean but irregular, nonfossiliferous - lower contact gradational into underlying silt	
193.2 - 203.1	5	3" CORE	100%	100%		Tuffaceous Wicko; med. gray N-5 to grayish brn. 5YR 7/6 v. fine grained, poor to mod. sorting, subrounded to rounded, 10-15% silt matrix, qtz, mica, feldspar % difficult to determine - possibly glass shards, noncalc. to mod. calc., bedding	

NOTES:

fuono

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/20/74 TITLE JUN. PHILLIPS - SOUND

ELEVATION _____ DATUM _____

START 00:00 COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED FAIRBANKS 2500, 6 3/4 DIAMOND BIT
ROTOR/AIR

LOGGED BY W.R. Lund & J. Cranor

P 9

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						indistinct-massive, mod. hard to hard, frac. at 70° at 194.5', horizontal parting planes at 193.5', 198.4', 200.8', 202.3', 204.9', 205.4', & 208.6, 30° frac. at 204.6 - frac. faces are rough & irregular; small fossil plant frags abundant throughout	
208.8-209.0	6	3" CORE	NA	100%		Tuff-Tuffaceous Siltstone; lt. brn. 5YR 5/6 to mod. yell. brn 10YR 7/4, 90% silt or below, well sorted, noncalc., laminated-bedding contorted, hard, fracture between 30-50° coincides w/this interval - frac. faces v. irregular, fossil plant frags present.	
209.0-222.3	6	3" CORE	92-97%	90%		Tuffaceous Wacke; med. dk. gray 11-4 to brnish gray 5YR 4/1, v. fine to fine grained, poorly sorted, subrounded to rounded gtz grains, with 5-10% muscovite & biotite, % silt matrix increasing with depth, noncalc. to locally mod. calc., bedding indistinct - thick to massive, hard, horizontal parting planes and	
Note: Contact w/ material below is gradational 222.3' is relatively arbitrary but marks the approx. change							

NOTES:

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FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/20/74 TITLE SUN-PHILLIPS-SUN10

ELEVATION _____ DATUM _____

START 00:00 COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FALKING 2500
6 3/4" DIAMOND BIT, AIR/ROTARY

LOGGED BY W. LUND & J. Cranor

P-10

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						fractures at 210.8' - 20°, 211.5, 211.8, 213.5, 216.4, 216.8, 218.7, 219.6, 219.3, 219.6, 220.6, 221.2, 221.9, 222.7 g/l	
						hrz, many frac. faces smooth	
222.3-231.4	6	3" CORE				sandy siltstone (tuffaceous); med. lt. gray	
						Note 3.24' core	
						unrecovered in	
						this run - believe	
						that it is from	
						this interval.	
						(222.3 - 234.99)	
						bedding indistinct - massive; mod. hard	
						to soft?? (believe that this is	
						the interval containing the 3.24' of	
						no recovery), horizontal parting planes	
						inclined and fracs abundant - representative 10°-20° occ. vert.	
						able to locate accurately due to missing	
						core, most faces smooth - some irreg.	
						surfaces, small pieces of plant remains	
						common. At 235' disseminated pyrite	
						becomes abundant - core recovery becomes	

NOTES:

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FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/20/74 TITLE SUN-PHILLIPS-SCHMS

ELEVATION _____ DATUM _____

START 00:00 COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED CAYNE WESTERN FALING 2500
6 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY W. LUND & J. CRANOP
P-11

RQD

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						<i>better</i>	
237.4'-237.7'	7	3" CORE	100%	100%		Interbedded Siltstones & Tuffs; mod. brn. SYR ^{3/4} (tuffs) to lt. olive gray SY ^{5/2} to olive gray SY ^{3/2} , 90% grains, silt or below, well sorted, silt. to mod. calc., v. thinly bedded-disturbed, hard, frac. at 237.45'-25", nonfossiliferous	
237.7'-239.6'	7	3" CORE	99%	100%		Sandy Siltstone; med. gray N-4, 3 25% sand 75% silt, poorly sorted, sand predominantly subrounded gts, some mica, noncalc., bedding indistinct, hard, nonfrac., nonfossiliferous	
239.6'-242.7'	7	3" CORE	100%	100%		Sandy Siltstone-Silty Sandstone (Wacke); lt. olive gray SY ^{5/2} to med. gray N-5 w/ occ. streaks of med brn SYR ^{3/4} , locally 50:50 sand-silt, v. thinly bedded, beds irregular (differential compaction), non to silt. calc., hard, hrz. parting plane at 239.4' & 242.1'-surfaces are rough & irregular - abundant disseminated pyrite, silt. petroliferous locally	

NOTES:

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FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/20/74 TITLE SUN-PHILLIPS-SOHIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FAIRING 2500
6 3/4 DIAMOND BIT, ROTARY/AIR

LOGGED BY W. R. LUND & J. CRANOR

P12

RQD

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
242.7'-255.3	7	3" CORE	100%	100%	Siltstone; lt. gray N-7 to med. dk. gray N-4, 90% grains silt or below, well-sorted, med. calc., laminated-v. regular with local differential compaction, hard, abun. disseminated pyrite, parting planes at 242.3', 244.6', 246.5', 247.5', 248.7', 249.7', 251.35', 253.7', 255.1'; carbonized plant remains.	
255.3-257.1	7	3" CORE	100%	100%	Interbedded sandy siltstone and silty sandstone; lt. gray N-2, med. dk. gray N-4 to pale brownish gray 10YR 6/2, silt to v. fine grained sand, poorly sorted, predominantly subrounded qtz. & mica, thinly bedded & laminated, hard, nonfrac., abun. plant remains.	
257.1-258.5	7	3" CORE	100%	100%	Siltstone; med. dk. gray N-4, 90% grains silt or below, silt. calc., thickly bedded, hard, horizontal frac. at 257.5' & 258.4' irregular block (3 1/2" dia) of pyrite, marcasite, and calcite.	
258.5-263 265.55	7	3" CORE	100%	100%	Siltstone; med. gray N-5 to med. dk. gray N-4, 90% grains silt size or below, silt.	

NOTES:

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FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/20/74 TITLE SUN-PHILLIPS-SAND

ELEVATION _____ DATUM _____

START 0000 COMPLETE _____

WATER LEVEL _____ AFTER _____ *

EQUIPMENT USED LAYNE-WESTERN FAIRING 2500
6 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R. LUND & J. CRANOR
P13

RQD

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						calc. to calc., laminated to thinly bedded, hard, parting planes at 260.15, 262.25, 262.7, faces rough & irregular but non- coated, pyrite locally abundant - 260.15' to 260.6' numerous blebs of pyrite	
						Note! Believe that the 19' of non-recovery is between 263' & 265'	
265.33	8		100	100		Tuff: light olive gray (5Y 6/1)	
267.48						hard, silt size grains, very thinly bedded, poorly sorted secondary calcite intergrowth otherwise non-calcareous possible mica, pyrite crystals very dense material, non- fractured, non-fossiliferous	
267.481	8		100	100		distinctive zone	
2288.50			100	100		Siltstone (Marlstone?) Yellowish grey (5Y 7/2) to light olive grey (5Y 5/2) and dark yellowish brown (10YR 4/2), hard to	

NOTES:

finco

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/20/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary Drilling 2500

LOGGED BY M. Siembieda

P. 14

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
267.45						very hard, silt size particle	
288.50						possible some very fine sands	
cont						generally massive (some thin bedding between 270.40 → 270.80)	
						highly calcareous. non-fossiliferous	
						non-fractured, gisonite and	
						or possible organic occur occasionally.	
						Section has been altered by	
						groundwater, (case harden?)	
						random zones of "weathered out" porous material. (more evident at bottom of section)	
						appears to be different	
						lithology but is the same	
288.50 →	8		100	75		Sandstone (Toff?) pale yellowish	
293						brown (10 YR 6/2) to brownish	
						gray (5 YR 5/1), hard, ^{very} fine-grained	
						to medium-grained, generally	
						massive, with some thin	
						beds, moderately sorted	

NOTES:

frano

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/20/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary Failing 2500

LOGGED BY M. Sienkiewy

(5A)

P ~~28~~ 15

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					gilsonite (some veins) quartz grains, mica, possible organics non-calcareous, porous non fossiliferous, possible joints but may be mechanical at 289.5 and 290.5.	
					gilsonite (some veins) quartz	
10/21/74	W. R. LUND					
283-294.9	8 3" CORE		100	100	Tuffaceous Wacke; pale yellowish brn. 10YR 6/2, v. fine to fine grained, subrounded, poorly sorted, predominantly gtz., mica (biotite), feldspar? (altering), glass? (devitrified), calcite to v. silt calc., thinly bedded w/ apparent local graded bedding, hard, brn. parting planes at 293.3', 294.3' & 294.9'; fine spaces of organic? material scattered throughout	
294.9-296	9 5" CORE			100%	Siltstone; pale brn. 5YR 5/2, 90% silt size but silt is approaching	

NOTES:

fuena

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/21/74 TITLE SUN-PHILLAS-SCHIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FAIRING LOGGED BY W. R. Lund

2500, 6 3/4" DIAMOND BIT, ROTARY/
AIR

P. 16

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					the lower limit of sand size, poor to med. sorting, noncalc., hard, hrz. parting plane at 295.3, scattered carbonized plant fragments	
296'-297.3	9	3" CORE	100	100	Sandy siltstone - silty sandstone, pale brn. 5YR 5/2, v. fine grained, subrounded, poorly sorted, sand predom. gts. w/ some mica, noncalc., bedding indistinct, hard, roots, carbonized plant remains common	
297.3-297.6	9	3" CORE	100	100	Retentive CLAYSTONE, bluish gray 5YR 3/2 to v. dusty red 10R 3/2, ^{appears extremely} fine grained (clay), well sorted, silt. calc., med. bedded, hard, hrz. parting plane w/ v. smooth faces (polished), nonfossiliferous.	
297.6-298.1	9	3" CORE	100	100	Siltstone, grayish brn. 5YR 3/2 to pale brn. 5YR 5/2, generally 90% grains silt. or below - sand may approach 15%, silt. calc., bedding indistinct-massive, noncalc., nonfossiliferous.	

NOTES:

fuoro

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/21/78 TITLE SUN-PHILLIPS-SOHIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED DAYNE-WESTERN FAIRING 2500

LOGGED BY W.R. LUND

(CA)
(fantastic)

6 3/4" DIAMOND BIT, ROTARY/AIR

'P.17'

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blow or Force	Recovery, Condition		
249.1-249.2	8	3" CORE	100	100	Petrolicaceous Claystone; v. thin horizon, similar to that described above.	
249.2-250.5	9	3" CORE	100	100	Sandy siltstone; grayish brown 5YR 3/2 to pale brown 5YR 5/2, approx 25% v. fine sand 75% silt, sand subrounded to rounded, partly sorted, sand produced by calc. med. calc. thinly bedded to blocky laminated, hard, 1/13. parting plane at 300.5' corresponding to a zone of lower sand content, petrolicaceous	
302.8-303	9	3" CORE	100% → 100%		Silty Claystone; grayish red 5YR 4/2 to dusky brown 5YR 4/2, predominantly clay w/ a significant silt fraction - v. few individual grains visible under a 14x hand lense, poor to moderately sorted, (floculated clay may give the impression of a higher silt content than is actually present), med. calc. to calc., rock initially appears massive but close observation of vertically	

NOTES:

fuoro

4.

BORING NO. P-3

ELEVATION _____ DATUM _____

WATER LEVEL _____ AFTER _____

LOGGED BY W. R. CONN
P18

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					split surfaces reveal v. fine lamination, hard, from 302.8 to 314.3 the rock is extremely fractured & it is from w/in this interval that the 0.125' of nonrecovery occurred, RRD in this interval is v. low ~18%, faces are hrz. w/ smooth surfaces, however from 303.3 to 307.2 the rock is split by a vert. fr. the faces of this fr. are smooth but coated w/ a sandy calcite, below 314.3 recovery was 100% & RRD was 100% from 318.6 to 319.5 the core is split by another vert. fr., this fr. is intact having been healed w/ secondary calcite, horizontal parting planes exist at 317.8', 318.1', 319.2', nonfossiliferous, silty petrolierous (silt. odor.)	

NOTES:

fuentes

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/21/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____


EQUIPMENT USED 5 1/2" Air Rotary Drilling

LOGGED BY H. S. McBride

S.A. 10/22

P 19.

RQD

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows Force	Recovery, Condition		
323-353	10		86	100	<p>silty claystone: Pale yellowish brown to (10YR 6/2) to Grayish brown (5YR 3/2) predominately claystone with silt comprising $\approx 20\%$. hard to very hard, thinly laminated, poorly ^{well} sorted moderately calcareous to highly calcareous. some to very fine crystals of pyrite, ^{+Mica} some gilsonite and possible organic stringers. non-fossiliferous, very homogeneous throughout section. Then appears to be many numerous parting planes but are probably mechanical breaks (highly polished). From 328 \rightarrow 331 a zone of joints. rock is highly broken, evidence of 3 joints occurring at roughly 30° 30° 120°  all are smooth and flat.</p>	

NOTES:

fuera

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/22/74 TITLE SUN-PHILLIPS-SOHIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FALING 2500
6 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R. LUND
P. 20.

5.11 10/22

RQD

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows of Force	Recovery, Condition		
353.0-353.5	10/11	3" CORE	100	100	Petroliferous Claystone-Shale; grayish black N-2, +90% grains silt or below, well sorted, silt. calc., laminated-bed, distorted by differential compaction, hard, hrs parting plane at 353.3' w/ v. smooth surface (core spinning), definite petroliferous odor, nonfossiliferous	
353.5-359.4	11	3" CORE	100	100	Silty Claystone, ^{shale} grayish brown 5YR 7/2, clay size with approx 20-25% silt, poorly mod. sorting, noncalc. to locally silt. calc., laminated - approx v. regular, hard, hrs. parting planes at 356.9' and 358.7'; petroliferous odor not apparent; however, grades downward to a 2	
359.4-369.7	11	3" CORE	98% 100	100	Petroliferous Claystone-Shale; dusky brn. 5YR 7/2 to v. dusky red 10R 7/2, clay size material w/ approx 25-30% fine silt (up slightly from above), poorly sorted, v. silt. calc., laminated-indistinct, hard, definite petroliferous odor, ecc. isolated	

NOTES:

fuoro

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/22/74 TITLE SUN-PHILLIPS-SOHIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FALING 2500
6 3/4 DIAMOND BIT, ROTARY/AIR

LOGGED BY W. R. LUND

51m

RQD

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						blebs of bitumen?, locally the petroleum content increases producing 1'-2' v. dark horizons, 3.1' tuffaceous stringers occur in the interval 367.5 - 368.2 - irregularly bedded and more porous than the material above and below, hrs. parting planes occur at 360.2', 361.4', 362.4', 363.5', 363.6', 363.8', 365.2', 366.6', 367.9', 367.8 369.5', 369.2', & 369.7' - all faces are smooth and clean, nonfossiliferous	
369.7-370.1	11	3" CORE	100	100		Silty Petroliferous Claystone; (tuffaceous?) Fresh surface of this material appears to be v. similar to claystone described above; however, this interval at core is rough & pitted indicating that it is siltier than the material above and below.	
370.1-373.6	11	3" CORE	100	100		Petroliferous Claystone-Shale (basically same as 359.4-369.7), grayish brn. 5YR 7/2, basically clay w/ appreciable silt (12-20%), poorly sorted, v. silt. calc., laminated-bedding	

NOTES:

fuoro

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/22/74 TITLE SUN-PHILLIPS - SONO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FALING 2500
& 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R. LUND

SA. 10/23/74

P. 22

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						appears regular w/ only local differential compaction, hard, petroliferous odor, h13.	
						parting planes at 370.1, 371.3, 371.7, 372.3	
						372.9 & 373.4, all faces are smooth & clean - many appear polished.	
373.6-375.0	11	3" CORE	100%	100%		Petroliferous Shale (Oil Shale); dusky brown 5YR 7/2 to brownish blk 5YR 4/1, clay size - maybe 10% silt, well sorted, micaceous, to silt calc., laminated - bedding v. well dev. and apparent in core; - generally wavy with many pinch and swell structures, a .05' v. irregular stringer of buff-grayish orange 10YR 7/4 occurs at 374.6' - this horizon also pinches & swells and has a v. wavy lower contact w/ the shale	
						hard, strong petroliferous odor & abundant specks of bituminous material visible w/ a 14X lense, h13 parting planes at 374.3' & 374.9', nonfossiliferous	
375.0-377.3	11	3" CORE	50%	100%		Tuffaceous Sandy Siltstone; pale yellowish	SHALE TUFF SHALE

NOTES:

Turner

FIELD LOG OF BORING

PROJECT NO. 74-068
 DATE 10/23/74 TITLE SUN-PHILLIPS - 30410
 START _____ COMPLETE _____
 EQUIPMENT USED LAYNE-WESTERN FALING 2500
6 3/4" DIAMOND BIT, ROTARY/AIR

BORING NO. P-3
 ELEVATION _____ DATUM _____
 WATER LEVEL _____ AFTER _____
 LOGGED BY W. R. LUND
 • P. 23

(S.A) 10/23/74

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					brown 10YR 6/2, silt-sand ratio 60-40 locally may be 50-50, sand appears to be v. fine grained rounded qtz. w/ acc. v. fine platy mica, bedding is indistinct. may be massive, silt. calc. though locally v. calc., mod. hard - core is pitted, appears to contain carbonitized plant remains, hrz. parting planes at 375.2, 375.5, 375.9, 376.3, w/ a vert. frac. splitting the core from 376.6 to 377.3	
377.3-382.9	11	3" CORE	77%	77%	Clayey Siltstone; grayish brown 5YR 3/2 to mod. brn. 5YR 3/4, initially appears v. similar to claystones above; however, v. fine, well rounded qtz? grains are definitely visible under a 14X lens. I believe these grains are < 1/16 mm in dia, poorly sorted, silt. to mod. calc., v. thinly bedded to laminated, hard, core breaks w/ a siltly hackly fracture, hrz. parting planes at 377.9, 378.9, 379.5 - and	

NOTES:

fuena

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/22/74 TITLE SUN-PHILLIPS-SONIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FALLING 2500

LOGGED BY W. R. LUND

S.P. 10/22/74 6 3/4" DIAMOND BIT, ROTARY/AIR

P. 24

ROD

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows Force	Recovery, Condition		
					below 380' - I believe that the 1.4'	
					of missing core came from below	
					380', nonfossiliferous, a faint petroliferous	
					odor	
382.9	10		78	100%	silty claystone: dark yellowish	
396.5					brown (10YR 4/2) to dusky brown	
					(5YR 2/2) very hard, thinly	
					laminated, poorly sorted,	
					moderately calcareous, some	
					petroliferous present, possible micro	
					Nacholite occurs as veins	
					and disseminated through rock,	
					non-fossiliferous, differentiated	
					compacted. Claystone is	
					randomly inter bedded with	
					fine-grained sandstone (tuff)	
					light brown (5YR 6/4), hard	
					highly calcareous, thickness	
					ranges from .01' to .15'	
					at 391 heavy concentration	

NOTES:

fuena

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/22/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W-Air Rotary Drilling 2500

LOGGED BY M. Siembieda

(S.A.) 10/22/74

RQD

25

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
	10				of sandstone. From 392.3 → 392.7	
					vertical joint, rough, irregular,	
					" Water " does not penetrate	
					entirely through core.	
396.5			87	87	Tuff: Pale yellowish brown	
411					(10YR 6/2) soft to moderately	
					hard, fine-grained, massive, Porous	
					non-calcareous. Inclusions of	
					calcite, feldspar(?), gilsonite	
					pyrite (some ^{small} veins or vugs	
					occurring), non-fossiliferous,	
					non-fractured, homogeneous	
411-412.6			93	100	Silty claystone: Grayish	
415.7					brown (5YR 3/2) hard, very	
					thinly laminated, silt comprises	
					≈ 15% of composition of rock	
					poorly sorted, moderately	
					calcareous, non fossiliferous	
					some inclined bedding and	
					differentiated compacted.	

NOTES:

fuena

1. 3

BORING NO. P-3

ELEVATION _____ DATUM _____

WATER LEVEL _____ AFTER _____

LOGGED BY M. Siembiedo

• 26 •

NOTES:	
	fuera

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/23/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary Drilling 2500

LOGGED BY M. Siembieda

(S.A) 14133

RQD

27

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
428 428 →	11		85	100	Claystone: Moderate brown	
431					(SYR 3/4) to Dusky brown	
					(SYR 2/2) hard, very little silt	
					thinly bedded, slightly calcareous	
					to moderately calcareous,	
					non-fossiliferous, low oil	
					content. At 430, broken	
10/23/74	W.R. LUND				zone of rock possible mechanical	
430.0-434.9			11%	30%	Tuffaceous Sandstone, dk. yellowish	
					dm. 10xR 1/2, fine to med grained, angular	
Note: Most of lost core					to subrounded, v. poorly sorted, abundant	
assigned to this					silt size material, silt calc, massive,	
interval.					soft and very porous, poor recovery,	
					rock is rubble and friable, non fossiliferous	
434.9-441.9			62%	100	Silty Claystone w/ Abundant Tuffaceous?	
					Inclusions; grayish brown SYR 1/2 to dusky	
					brown SYR 3/4 (claystone), pinkish gray	
					SYR 2/1, claystone appears to be ~ 20-25%	
					silt ~ 80% clay, poorly sorted, tuff	
					is badly altered - fine qtz. grains in	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/23/74 TITLE SUN-PHILLIPS-SO110

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN, FAIRBANKS
2500, 6 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R. LUND

S.A. 10/23

RQD

p 28

DEPTH	SAMPLES				RECOVERY, Condition	DESCRIPTION Soil type, color, consistency, moisture- condition, grain-size distribution, bedding, geologic details:	REMARKS
	No.	Type	Blows or Force				
						a matrix of devitrified glass and feldspar locally tuff may appear as stringers but generally occurs as individual lenticular pods, tuff is much softer than the clay stone so tuffaceous areas appear pitted, horz. parting planes at 434.9', 435.3, 435.9, 436.8', 437.0, 437.3, 437.5, 437.8, 438.0, 438.3, 438.5, 438.8, 438.9, 439.2, 439.8, 440.1, 440.5, 440.9, 441.4, nonfossiliferous; pods & stringers of tuff give core a speckled appearance.	
441.4-442.6	13	3" CORE	30% 100	100		Silty Claystone w/ Tuffaceous Horizons; med. gray N-S (claystone) to lt. brownish gray STRY (tuff rich beds), 80-85% clay - 15-20% silt, poorly sorted, noncalc. (gray claystone) to med. calc. (tuffaceous layers), laminated- wavy bedding especially near lower contact - due to differential compaction, hard, horz. parting planes at 441.8', 442.0, 442.3	

NOTES:

THURS

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/23/79 TITLE SUN-PHILLIPS-SOHIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE WESTERN FALING 2500
6 3/4" DIAMOND BIT, ROTARY AIR

LOGGED BY W. R. LUND

S.A 10/13

Rad

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
442.6-449.7	14	3" CORE	0	52%	Claystone and Crystalline Calcite; blkish red 5R 4/2 to dusky brn. 5YR 4/2 (claystone) to v. lt. gray N-7 (calcite), claystone is typical of that described previously, med sorted, noncalc., hard, bedding is indistinct, the calcite is coarsely crystalline w/ many well dev. xls visible with the hand lens, it occurs as irregular stringers that cut bedding, as conformable horizons parallel to bedding and as irregular blebs and pods which may be occupying previously existing cavities, a considerable amount of silt is contained within the calcite. Recovery of core from this interval was poor, the calcite is soft and dissolves readily, the majority of nonrecovered core - (see page 20) ignored to it, locally petioliferous, non-lacustrine, thin to med bedding.	

NOTES:

Fuentes

FIELD LOG OF BORING

PROJECT NO. 74-068-

BORING NO. P-3

DATE 10/23/74 TITLE JUN-PHILLIPS-SCHW

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FAIRLIE 2500, 6 3/4"

LOGGED BY W. R. Lund

diamond bit, air/mud

P. 30

5A 10/23

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
449.7-452.5	14	3" CORE	30%	100%	Tuffaceous? Claystone-Shale; dk. yellowish brn. 10YR 4/2 to grayish orange pink 5YR 7/2, clay w/ abun. v. fine light colored material (cluff-or ^{secondary min.} compacted?) poorly sorted, alt. calc., v. thinly bedded to laminated, locally lighter colored material appears to show graded bedding, hard, hrz. parting planes abundant every 1.3' or less, numerous lenticles, light material fissile violently - may represent an secondary mineral replacement cluff?	
452.5-454.0	14	3" CORE	0%	100%	Tuffaceous Petrified Shale; blk N- to mod. brown 5YR 3/4, 70-90% (varies) clay w/ 10-30% lt. colored material (cluff - secondary minerals) poor to well sorted, alt. to mod. calc., laminated, v. regular, hard, hrz. parting planes at 453.1, 453.9, 453.6, 453.8, strong odor	

NOTES:

for

FIELD LOG OF BORING

PROJECT NO. 74-062

BORING NO. P-3

DATE 10/23/74 TITLE SUN-PHILLIPS-50410

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L.W. FAKING 2500, 1 3/8" DIAMOND BIT, AIR/Rotary LOGGED BY W.R. Lurd

S.A. N/33

P.31

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
454.0 - 456.2					Claystone w/ Calcite Stringers; grayish red SR 4/2 (claystone) to white. N-9 (calcite), claystone 90% + clay & silt size material, poor to med. sorted, nonscale, hard, bedding appears massive, calcite occurs in coarse xls and occurs as irregular stringers through out the rock - xls of pyrite & marcasite? are assoc. w/ the calcite, much of calcite may be occupying mudcracks and other voids in rock.	
456.2 -	14	CORE	50%	90%	Tuffaceous? Petroliferous Shale; v. dusky red to locally blk. N-1, admixture of clay & lt. colored material (altered or replaced tuff) in varying amounts, silt. to locally highly calc., v. thinly bedded to laminated, locally concentrations of lt. colored material gives the impression of graded bedding - in other areas	

NOTES:

TUNN

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/23/74 TITLE SUN-PHILLIPS - 30410

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FAIRING 2500, 6 3/4"
DIAMOND BIT, ROTARY AIR

LOGGED BY W. R. Lund
P32

S.A. 10/23

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						it marked the rock appear massive	
						462.0-462.3 & 470.8-471.0 contain what	
						appear to be solution cavities where	
						calcite or nucholite may have been dissolved	
						away, much of the remaining missing	
						core has been assigned to this	
						interval - for this reason it is v.	
						difficult to accurately locate the	
						abundant horizontal parting planes and	
						few high angle 60°+ joints which occur	
						in this area - most high angle joints	
						occur below 467'	
						Note: Most of the rock in this core	
						run has contained abundant fine fragments	
						of what appears to be devitrified volcanic	
						material, this material almost always reacts	
						violently to HCL, in many places appears	
						spherulitic, and occasionally contains a	
						translucent mineral. Locally, this material	

NOTES:

THURS

FIELD LOG OF BORING

PROJECT NO. 74-06B

BORING NO. P-3

DATE 10/23/76 TITLE Sun-Phillips - SONIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FAIRING 2500, 6 3/4"
DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R. LUND

S.A. 10/23

P.33.

RQD

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						exhibits what appears to be graded bedding. I think this material represents a deacidified or replaced lith.	
40.2 → cont	15		55	80		Continuation of same lithology. rock is badly broken at 491, gilsonite and weathered pyrite and mica occurs, high angle joints at 482, 484, 499. Particular poor recovery between 445 → 499. Solution cavities (Vugs) at 471, 474, 496, 498. these contain highly calcareous material (Nacrolite, calcite) they do not seem to follow any particular bed, joint or fracture, occurring randomly. some differential compaction causing minor offset can be	

NOTES:

frano

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/24/74 TITLE SUN-PHILLIPS - SONIC

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FARMING 250
6 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R. Lund

34

RQD

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						seen in the polished rock	
						breaks, [offsets of .01"]	
						Tuff content decreasing at	
						depth, but other wise appears	
						to be same lithology	
10/24/74	W. R. Lund						
500-502.8	15	3" CORE	40%	70%		Petrofiferous Chert, (shale); grayish red RR 1/2 to blk. N-1, 90% clay silt, poor to mod. sorting, nodular to locally mod. calc., recovery & RQD thru interval was low, rock contains relatively large vugs or cavities from which it appears minerals have been dissolved, one such cavity contains a mineral of massive to platy habit (heavily micro brecciated structure developed), mod. pink SR 1/4 in color, which is hard > 5 and does not react to HCl, remainder of cavity appears to be coated w/ a fine granular bituminous material.	

NOTES:

7-23-73 L-013

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/24/79 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FALING 2500

LOGGED BY W.R. Lund

6 3/4" DIAMOND BIT, ROTARY/AIR

P.35

S.A. 10/24

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						rock has definite odor; parting planes numerous but unable to locate accurately due to poor recovery, rock contains some apparently tuffaceous material which decreases w/ depth - by 500' only a minor constituent.	
502.0'-508.5	16	3" CORE	91%	100		Claystone - Shale; grayish red SR 9/2 to dk. reddish brown 10R 3/4 90%+ clay or silt, well sorted, med. calc., laminated to thinly bedded - bedding generally indistinct, hard, locally petroclitic, hard, hrs. parting planes at 503.7, 504.6, 505.0, vert frag. between 503.0 and 503.5 - parting plane faces smooth and clean (polished)	
505'-511.1	10		98%	100%		Tuffaceous? Claystone - Shale; dk. reddish brown 10R 3/4 to blk N-1 (locally), 85% clay 15% small white specks (dent. and replaced tuffa?) poorly sorted, med. calc. - specks v. calc., v. thinly bedded to laminated - bedding generally indistinct,	

NOTES:

frano

FIELD LOG OF BORING

PROJECT NO. 7-68

BORING NO. P-3

DATE 10/24/74 TITLE SUN-PHILLAS - SONIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTON FAIRING 2500
6 3/4 DIAMOND BIT, ROTARY/AIR

LOGGED BY W.B. Lund

(3-A) 10/24

P. 36

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					hard, local petraliferous zones, hrz.	
					parting planes at 509.5 (possible 5-10 dip)	
					509.2, 510.2, and 510.9, faces smooth & clean	
					except in petraliferous zones - rough at	
					inter coatings	
SUN-514.6	16	3" CORE	100	100	Claystone - shaly, grayish brown 510 1/2, dark	
					brown 510 1/2 to pale brown 515 1/2, 516	
					shy, fine silt, well sorted, silt to med.	
					clay, laminated - generally indistinct, locally	
					laminated / compaction evident, rock has	
					some petraliferous in upper part increases	
					in content, as bituminous (tar like)	
					in part based on parting planes, hard,	
					excellent core recovery, parting planes	
					at 512.8, 514.3, 515.2, 515.9, 517.6	
					518.5 and 522.0 - faces generally are	
					smooth and clean (polished), most parting	
					planes correspond to local increases in	
					petraliferous content	
524.6 - 524.7	16	3" CORE	100	100	Mudstone (Marlstone?), med. brown 518 3/4	

NOTES:

frano

FIELD LOG OF BORING

PROJECT NO. 74-968

BORING NO. P-3

DATE 10/24/74 TITLE SUN-PHILLIPS-SUNIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FAIRING 2500 LOGGED BY W.R. Lund

6 3/4 DIAMOND BIT, ROTARY/AIR

P. 37

S.A. 10/24

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					mixture of clay, silt, & v. fine rounded sand & qtz, partly sorted, silt to med. calc., v. thinly laminated, mottled - can dig with finger nail, high parting plane of a clay irregular in the rock	
					upper contact	
524.7-525	16	3" CORE	100	100	Claystone - Petroliferous Claystone (Shale); grayish red SR 4 1/2 to 6 1/2. N-1, 90%+ grains clay or v. fine silt, med. to well sorted, silt calc. to heavy med. calc. laminated - generally indistinct - thin parting plane - petroleum content 5-10% SR 4 1/2 to high, dec. for like bituminous material laminar parting planes, rock has all to med. petroliferous char - more so than rock above mentioned	
					interbed - but still not real strong, high parting planes at 520.7, 520.8, 526.5, 527.3, 527.8, 529.0, 530.2	
534.5-535.2	17	3" CORE	100	100	Silty Claystone - Shale; dusky brown SR 4 1/2, 90%+ clay and silt size material	

NOTES:

THOMAS

41

BORING NO. P-3

ELEVATION _____ DATUM _____

WATER LEVEL _____ AFTER _____

LOGGED BY W.R. Lund

P39

10/24

NOTES:	Name

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/24/74 TITLE SUN-PHILLIPS-SCH10

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LOVINE-WESTERN FALLING 1500
6 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY W.A. Lund
P.39

(S.D) 10/24

RQD

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					to dusky brown silt 15-20% silt 80-85% clay, poor to mod. sorted, mod. calc. lam. in bed - generally indistinct, silt petro- lithic w/ some spots of bituminous material on fresh surfaces, hard & brittle, horz. parting plane at 547.6, 548.6, 549.6, 550.8	
551.6-552.9	17	3" CORE	100	100	Petrofiferous Shale, dk. yellowish brn silt 10% 1/2 in blk N-1, 90% silt or clay size, well sorted, narrow to v. silt calc. laminated - well dev. - strong petrofiferous odor, abun. bit. bituminous material, hard, horz. parting plane at 552.2	
552.9-554.0	17		100	100	Silty Claystone, dusky brn. silt 15-20% silt 80-85% clay, poor to mod. sorting, mod. calc. to calc. laminated - gen. indistinct horz. pp. at 553.7, silt petrofiferous	
554.0-557.2	17	3" CORE	100	100	Siltstone, dusky brn. silt 15-20% coarse silt w/ unknown 20% clay content, poorly sorted, laminated to a thinly bedded.	

NOTES:

Turno

FIELD LOG OF BORING

PROJECT NO. 7406B

BORING NO. P-3

DATE 10/24/74 TITLE SUN - PHILLIPS - SONHO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED CAINE - WESTERN FALING 2500

LOGGED BY W.R. LUND

(S.A.) 10/24

. 40 .

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
557.2-					mod. calc., hard - resistant, non fractured - Siltstone WRL Silty Claystone, dusky brn. 5YR 2/2 to v. dusky red 10R 2/2, silt-clay ratio highly variable - gen. 30:70 but locally 40:60 or possibly 50:50, calc. bedding indistinct, hard, hrz. parting planes at 558.0 & 559.3 - somewhat p. clean.	587.25
561.	10		89	99	Continuation of lithology some dusky yellowish brown 10YR 2/2 bedding faint but where seen is laminated. silt content generally around 25%, some slightly higher zones, slightly calcareous to moderately calcareous, some neoholite and very small amount of pyrite, some moderate oil content. Tuff sandstone occurs at 568.5 (.05' thick), 575.5 (.1') 576.4 (1.1')	570.92 571.14

NOTES:

THREE

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/25/74 TITLE SUN-PHILLES-SONHO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FAIRBANK 2500
6 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R. Lund

S.A. 10/25

RCD

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows Force	Recovery, Condition		
					5863 (.05) and some under .01.	
					scattered through section.	
					non-fossiliferous tuff is pale yellowish	
					brown (10YR 8/2) hard, fine to	
					medium grain, moderate sorting	
					slightly calcareous, massive,	
					some contain oil. Claystone	
					is very homogeneous, it is	
					non-fossiliferous, non-lenticular	
					non-fracture.	
W.R. LUND	10/25/74					
591-596.1	18/19	3" CORE	100	100	Silty fine Claystone - Shale; v. dusky	
					red 10R 4/2 to dusky brown 5YR 4/2, 10-15%	
					silt - 85-90% clay, poor to mod. sorting,	
					mod. calc., laminated - well dev. & regular,	
					hard, his. parting planes at 594.9, 592.0 (± 5°)	
					590.0, 585.6, faces smooth to stlly irreg -	
					clean	
596.1-597.2	19	3" CORE	100	100	Argillaceous Siltstone; bluish red 5YR 4/2	
					to v. dusky red 10R 4/2, v. fine to coarse	
					silt and > 10% clay, poorly sorted, silt to	

NOTES:

RCH 10-25

Trans

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. ~~74-0~~ P-3

DATE 10/25/74 TITLE SUN-PHILLIPS-SUN/10

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FAIRING 2500
6 3/4" DIAMOND BIT, AIR/ROTARY

LOGGED BY W. R. LUND

S.A. 10/85

42

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
621.0					mod. calc, hard, nonfrac.	
597.2	19	3" CORE	9597%	100	Silty Claystone - Argillaceous Silts tone =	
					shale; v. dusky red m ² / ₂ to grayish	
					red s ² / ₂ to locally black, mixture of	
					silt and clay - variable - rock is border line	
					and probably should simply be referred	
					to as shale, poorly sorted, mod. calc.	
					to calc, laminated to v. thin	
					bedded, silty to mod. petaliferous	RC H
					my isolated thin horizons of higher	10-25
					petaliferous content, hard & tough,	
					parting planes at 598.6, 599.6, 599.9	
					601.3, 602.8, 604.7, 605.7, 606.6, 609.0,	
					610.6, 612.5, 613.3, 613.6, 613.9, 614.4, 615.2	
					615.7, 616.6, 617.3, 617.5, 617.9, 618.9, 619.3	
					many of these planes correspond to horizons	
					of petaliferous correlative, faces are	
					smooth to sth rough and clean; rock	
					is v. homogeneous throughout - not even	
					an occasional thin luff stringer.	

NOTES:	RC H 10-25

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/25/74 TITLE SUN-PHILLIPS-SOHIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED FALLING 2500 - LAYNE-WESTERN
6 3/4" DIAMOND BIT, AIR/ROTARY

LOGGED BY W.R. Lund
.43.

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
621.0 - 625.6	20	3" CORE	100%	100%		Petroliferous Silty Claystone - Shale; bluish red 5R 2/2 to brownish blk 5YR 2/1; silt-clay ratio difficult to estimate due to presence of abundant v. fine films of bituminous material, poor to med. sorting, massive to v. silty calc., laminated - v. well dev., pinch and swell structures abundant, hard - brittle, parting planes at 621.2, 622.2, 623.0, 623.4, 624.9' - faces are smooth and clean w/ no coatings - most correspond to local increases in bitumen content.	
625.6 - 634.1	20	3" CORE	100%	100%		Silty Claystone - Shale; bluish red 5R 2/2 to grayish brown 5YR 2/2, clay and silt size material with clay predominating, poorly sorted, v. silty, calc. to med. calc., laminated - well dev., irregular only occ. pinch and swell structures, fresh surface has speckled appearance - reflecting planes on v. fine grained bituminous material	

NOTES:

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FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 11/25/74 TITLE SUN-PHILLIPS-SANJO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN FALING 2500
6 3/4" DIAMOND BIT, Rotary/Air

LOGGED BY W. R. Lund

44'

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:		
						parting planes at 626.8, 627.9, 629.4, 630.6, and 633.9'; v. thin (±.05') buff horizons w/in this horizon, parting planes commonly dev. along them.	
634.1-635.2	20	3" CORE	100%	100%		Petroliciferous claystone (Oil shale); dusky brn. silt. to brn. blk silt. clay & silt size material, silt. to med. calc., silt. to med. calc., laminated, v. well dev., .05' thick h. humous rich buff zone at 638.5' - lower contact unrecy (differential compaction) hard, nonfrac.	
635.2-647.1	20	3" CORE	100%	100%		Silty claystone - shale; med. dk. gray to olive gray silt. or olive blk. silt. clay & silt size material varies but clay & silt, poor to med. sorting, laminated, well dev. & regular, v. silt. calc., local increases in petroleum content - gen ±.05' in width & isolated, silt. petroliferous nodar, thin (±.05') buffaceous horizons occ. locally, parting planes at 637.5' 638.7', 640.5', 641.7', 642.0', 645.2' - faces clean & smooth	

NOTES:

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FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/25/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LAYNE-WESTERN, FAIRING 2500
6 3/4" DIAMOND BIT, ROTARY AIR

LOGGED BY W. R. Lund

45

RQD

45

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
647.1-648.1	20	3" CORE	100	100	<p>Petroliferous Claystone; (Oil Shale); dusty brn. 5YR 4/2 to blk M-1, clay and silt size material - clay predominates, med to well sorted, micaceous to v. silty calc., laminated well dev. - v. regular - acc. v. thin (2.01')</p> <p>luffaceous zones</p>	
648.1-655.28	21	3" CORE	100	100	<p>Silty Claystone-Shale; dk. gray M-4, silt & clay w/ clay predominate (gen. 30:70 to 15:85) med. to poor sorting, micaceous to v. silty calc., laminated - indistinct, hard, hrz. parting planes at 648.1 and 649.7' - faces smooth to silty irregular, at 653.4' stringers of buff sandstone .01" thick</p>	
M. Siembielny	21		100	100	<p>Oil "Shale"; dusty yellowish brn. 10YR 4/2 w. hard, small percentage of silt (20-10) v. silty calc., laminated, poorly sorted, unfractured, moderate oil content</p>	
655.28-						
655.29-						

NOTES:	

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/25/75 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LW Air Rotary Drilling 2500

LOGGED BY M. Siemhieda

46

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
655.74 -	21		100	100	Silty claystone; dusky	
661.42					brown (5YR ^{3/2}) hard, laminated	
					silt comprises $\approx 30-40\%$, slightly	
					calcareous to moderately	
					calcareous, poorly sorted	
					non-fractured, non-fossiliferous	
					No parting planes, very homogeneous	
					At 658.43 and 658.9 Sandstone	
					tuffs, hard, non-calcareous, irregular	
					contact with clay stone	
661.42	21		100	100	"Oil shale" dusky yellowish	
662.20					brown (10YR ^{3/2}) very hard	
					laminated, silt content $\approx 20\%$	
					slightly calcareous, moderate	
					oil content, non-fractured	
					non-fossiliferous, some	
					small crystals of pyrite	
662.20			100	100	Silty Claystones brownish gray	
667.62					(5YR ^{3/1}) hard, silt content	
					$\approx 40\%$, laminated, moderately	

NOTES:

S.A. 10/25

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/25/75 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W A. Rotary Drilling 2500

LOGGED BY M. Siembieda

47

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
661.20	21				calcareous, some poorly sorted	
662.20					some very fine pyrite crystals	
667.62 cont					non-fossiliferous non-fractured	
					very homogeneous	
667.62	21		106	100	Sands tone tuff, hard	
667.72					moderately calcareous, medium to fine grained	
667.72	21		100	100	"Oil shale" dusky yellowish	
668.65					brown (10 YR 2/2) to grayish black	
					(N2) very hard, laminated	
					silt content 30-40%, non-calcareous	
					to slightly calcareous, moderate	
					oil content, some slight	
					differential compaction at	
					upper contact	
668.65	21		99	100	Silty Clay stone olive grey	
680.1					(5 Y 4/1) to dusky yellowish brown	
					(10 YR 2/2) hard to very hard	
					silt content \approx 25% (\pm 10%)	
					laminated, slightly calcareous	

NOTES:

finno

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/25/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LW Air Rotary Drilling 2500

LOGGED BY M. Siembieda

48

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
→	21				poorly sorted, some fine-grained pyrite - non fossiliferous, non fractured, very homogeneous.	
680.10					possible thin stringers of nahcolite.	
cont					Tuff sandstone at	
					668.9 (.15' thick) 675.42 →	
					676.12, 677.65 → 677.8?	
					677.35 (0+.5 thick) band	
					fine to medium-grained, non	
					calcareous to very slightly calcareous	
					moderate to high oil content	
					irregular contacts with claystone	
680.10 →	22		100	100	"Oil shale" dusky brown	
683.10					(5YR ^{2/2}) hard to very hard	
					laminated, low percentage of	
					silt ≈ 15%, slightly calcareous	
					fine-grained pyrite crystals	
					moderate to low oil content	
					non-fossiliferous, non fractured	

NOTES:

S.H. 10/25

flame

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. D-3

DATE 10/25/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary

LOGGED BY M. Siemhieda

49

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
683.10	22	core	100	100	Silty Claystone: dusky brown	
686.44					SYR 1/2 hard, laminated, silt content	
					≈ 30% ± 10% very slightly calcareous	poorly sorted
					non-fossiliferous, non-fractured	
					parting plane at 685.14, slight	
					amount of oil, homogeneous	
686.44	22		100	100	Oil shale dusky brown SYR 3/4 (?)	
687.00					hard to Very hard, laminated	
					moderate to low oil content	
					sharp contacts, color slightly	
					darker	
687.00 →	22		100	100	Silty Claystone: dusky brown	
691.54					SYR 1/2 to dusky yellowish brown	
					10YR 3/6, hard to Very hard	
					laminated (bedding faint), silt	
					content 20% → 40%, slightly	
					calcareous, non-fossiliferous	
					non-fractured, fine pyrite crystals	
					Parting plane at 689.75. Sandstone	
					to 689.60 → 689.75, fine to	

NOTES:

7-23-73

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/25/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary Drilling 2500

LOGGED BY M. Sienhiedt

50
47

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
cont	22				medium grained, moderate sorting	
					slightly calcareous, H ₂ S gas	
					porous, some oil	
691.54	22		100	100	Sandstone to fine dusky yellowish	
692.42					brown (over 3/2) hard to very	
					hard, fine to medium grained	
					some interbedded claystone	
					otherwise massive, moderate	
					sorting, non-calcareous	
					possible vertical fracture	
					some H ₂ S gas	
692.42	22		100	100	Silty Claystone: Grayish brown	
					(5YR 3/2) to brownish gray (5YR 4/1)	
					hard, laminated (faint bedding)	
					silt content 20-50% generally	
					25%, slightly calcareous, some	
					pyrite crystals and gilsonite	
					scaled vertical fractures	
					throughout section, parting	
					planes at 696.20, 698.15	

NOTES:

fin

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/25/75 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LW Air Rotary Filing 2500

LOGGED BY M. Siembiede

S.A. 10/26

50a

DEPTH	SAMPLES				DESCRIPTION		REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:		
cont 11	22	22	22		699.86 702.80 709.80.		
			100	100	non-fossiliferous, lithology very homogeneous. Sandstone		
					tuff at 695.00 → 695.17		
					699.62-699.47, 700.66 (.02" thick)		
					between 702.45 and 703 several		
					small stringers, 707.34 → 707.47		
					708.7 → 709.4, hard to very		
					hard, fine to medium grain,		
					non-calcareous to very slightly		
					calcareous, porous, H ₂ S gas		
					present, some oil content		
10/26/79	23	5% CORE	100	100	Silty Claystone - slate; dk. reddish brown		
710.0 - 712.25	23	5% CORE	100	100	10R 3/4 to dusky brown 5YR 4/2, silt-clay		
					mixture ± 25-75, poorly sorted, laminated		
					well dev. & regular, and calc. to calc.		
					hard, silt. pet. lithiferous but w/ increasing		
					oil content w/ depth, hrs. parting		
					plane with smooth clean surface, at 710.77		

NOTES:

frano

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/26/74 TITLE SUN-PHILLIPS-SUNIC

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED C-LU FAKING ZERO 6 3/4"
DIAMOND Bit, Rotary / Air

LOGGED BY W.R. Lund

51

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						a thin c. 0.5' bituminous rich tuff zone - blk N-1	
712.25 - 712.61	23	3 1/2" CORE	100	100		Interbedded Bituminous Tuff & Petriferous Claystone; blk N-1 to dusky brown silt, predominantly silt & clay size w/ occ. sand grains, poor to med. sorting, med. calc. to calc., hard, nonfractured, upper and lower contacts irregular.	
712.61 - 714.15	23	3 1/2" CORE	80%	80%		Silty Claystone - Shale; dusky brn silt to v. dusky red med. silt, 20-30% silt, poorly sorted, calc., laminated, silty to med. petriferous, irregular-rough parting plane at 713.00 - .93' NR assigned here.	
714.15 - 715.34	23	3 1/2" CORE	100%	100%		Petriferous Claystone "Oil Shale", blk N-1 to med. brown silt (lufaceous layers), 10-15% silt, med. to well sorted, calc., laminated-well dev., hard, strong petriferous odor; irregular parting plane at 714.99', occ. v. thin ^{bituminous} lufaceous zones - lower contact bounded by an especially rich zone.	

NOTES:

THURS

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/26/70 TITLE SUN-PHILLIPS - 50H10

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FALLING 2500, 6 3/4
DIAMOND B.T., ROTARY/AIR

LOGGED BY WRL

952

S.A. 10/26

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
715.34-720.1	23	5 1/2 CORE	100	100	Silty Clay stone - Slate; grayish brown SVR 3 1/2, clay silt mixture - ratios difficult to determine due to abundance of finely disseminated bituminous material - which give fresh faces a "sparkly" appearance, poorly sorted, med. to silt cut. - decreasing w/depth - also w/depth get the appearance of relatively large .01-.02 dia. blebs of bituminous material, laminated, hard, silt. to med. petroliferous odor, 718.20-718.35 bituminous rich bituminous horizon, hrs. parting planes at 718.20, 718.5, faces irregular - clean.	
720.1-721.30	23	5 1/2 CORE	100	100	Petroliferous Claystone - "Oil Slate" blk N-1 to v. dusky red 10R 7 1/2, 10-15% silt, poorly med. sorted, silt. to med. cut., laminated - well developed, med. to strong petroliferous odor, hard, hrs. parting plane at 720.6	
721.30-723.20	23	3 1/2 CORE	100	100	Silty Clay stone - Slate; grayish brn SVR 2 1/2 clay & silt - clay predominates, poorly sorted	

NOTES:

FORM

FIELD LOG OF BORING

PROJECT NO. 74-060 BORING NO. P-3
 DATE 10/26/79 TITLE SUN-PHILLIPS - 30410 ELEVATION _____ DATUM _____
 START _____ COMPLETE _____ WATER LEVEL _____ AFTER _____
 EQUIPMENT USED L-10 FAIRING 7500, 6 3/4" DIAMOND LOGGED BY W. R. Lund
Bit, ROTARY/AIR 'PSS'

RQD

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
729.20 - 729.6	23	3 1/2 CORE	65% 100	100	silt. to med. calc., laminated, hard, massive Petroliferous Claystone "Oil Shale" blk N-1 to dusky brn. silt, 10-15% silt, poor to med. sorted, med. calc. to calc., laminated, med. to strong petroliferous calc., hard, irregular surface, parting planes at 723.35 & 723.45 - upper to coarse w/ a tuffaceous zone.	
729.65 - 729.5	23	3 1/2 CORE	100	100	Silty Claystone - Shale; med. brn. silt, 15-35% silt, poorly sorted, med. calc., laminated, silt. petroliferous, massive.	
729.55 - 728.5	23	3 1/2 CORE	100	100	Silicious Tuff; lt. brn silt, 15% to lt. gray N-2, med to coarse grained qtz. sand w/ v. fine matrix, shapes & sizes difficult to determine due to silicious cement - matrix possibly bioclastic, silt. calc., bedding v. irregular and wavy, very hard, irregular surface parting planes at 723.3 & 722.7; upper & lower contacts v. sharp - silty wavy	
728.5 - 728.1					Silty Claystone - Shale; med. brn. silt, 10-25% silt, poor to med. sorting, silt. to	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/26/74 TITLE SONI-PHILIPS-SONIC

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FAILING 2500, 6 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R.L.

P.54

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						mod. calc., hard, nonfractured, .15'	
						bituminous silt horizon at 730.9	
731.1 - 731.5	23	3 1/2" CORE	100	100		Petroliiferous Claystone; blk N-1, 10-15% silt, poor to moderately sorted, calc., laminated, nonfrag.	
731.5 - 741.7	23 1/2"	CORE	100	100		Silty Claystone-Shale; brownish gray SYR4/1 to v. dusky red 10R 7/2, silt 20-30% locally 40%, poorly sorted, laminated & well dev. to indistinct, silt. calc., silty to medly. petroliiferous, hard, hrz. parting planes at 735.1, 736.1, 738.3, 739.8, local thin zones of increased petroliiferous content becoming more numerous with depth until grades to oil shale	
741.7 - 749.6	24	3 1/2" CORE	100	100		Petroliiferous Claystone "Oil Shale"; blk N-1 to v. dusky red 10R 7/2, approx 5-10% silt, well sorted, noncalc. to locally v. silty calc. (individual laminae), laminated; well dev., mod. to strong petroliiferous odor, hard, hrz. parting planes at 741.95	

NOTES:

fuoro

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/26/74 TITLE SUN-Phillips - SONIC

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-10 FAIRING 2500, 6 3/4 DIAMOND
Bit, Rotary/Air

LOGGED BY W.R. Lund
P. 55

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					742.7, 743.3, faces are smooth to silty irregular - locally silty coated with CaCO ₃	
743.6 - 745.3	24	3 1/2 CORE	100	100	Siltstone; pale yellowish brown 10YR 4/2 to grayish brown 5YR 3/2, alternating coarse and fine laminae. (fine laminae may actually be a silty claystone), clay to v. fine sand w/ silt predominant, silt and sand consist of rounded qtz. and v. fine grained tuffaceous? material, poor to med. sorted, med. calc. to calc., laminated; v. well developed, hard, nonfractured	
745.3 - 751.6	24	3 1/2 CORE	100	100	Petroliferous Claystone "Oil Shale"; blk wt-1, to dusky brn. 5YR 4/2, 10-22% silt, poor to well sorted, med. calc., med. to strong, petroliferous odor, hard, parting planes 746.6, 748.8, smooth & clean - show the effects of polishing.	laminated - well dev.
751.6 - 756.4	24	3 1/2 CORE	100	100	Silty Claystone - "Borderline Oil Shale"; dusky yellowish brn. 10YR 4/2, 10-15% silt.	

NOTES:

THURS

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/26/74 TITLE _____

ELEVATION _____ DATUM _____

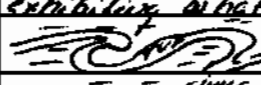
START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FAIRING 2500 6 3/4"
DIAMOND B. & I. Rotary/Air

LOGGED BY W.R. Lund
R. SG.

RCD

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					med. to well sorted, med. calc., laminated - well dev. silt to med. petrocliferous - rock has > oil content than the silty claystones described above - but generally less than what I have been calling oil shale - i.e. is borderline and could be classed either way, hard, has parting planes at 752.3', 753.75,	
754.4 - 755.7	24	3 1/2 GRC	100	100	Petrocliferous Claystone "Oil Shale", blk N-1 to dusky brown 5YR 2/2, ±10% silt, well sorted, med. calc. to calc., laminated - well dev. local evidence of differential compaction occ. v. thin (.01-.02') tuffaceous zones exhibiting what appear to be roll structures	
					 hard, nonfractured.	
755.7 - 761.4	24	3 1/2 GRC	100	100	Interbedded Petrocliferous Claystone and Tuffaceous claystone ^{claystone} ; blk N-1 to pale yellowish brown 10YR 4/2, 10-30% silt varying w/locularity, poorly sorted, calc., laminated to thinly bedded, well dev.; appears to be a	

NOTES:

THURS

FIELD LOG OF BORING

PROJECT NO. 74-068
 DATE 10/26/74 TITLE SON-PHILLIPS - SENIO
 START _____ COMPLETE _____
 EQUIPMENT USED L-W FAIRBANKS 2500, 6 3/4"
DIAMOND B.T., Rotary/Air

BORING NO. P-3
 ELEVATION _____ DATUM _____
 WATER LEVEL _____ AFTER _____
 LOGGED BY R.R. Lund

57

RGD

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						transition zone from the oil shale to the	
						luft sequence which follows, hrz. parting	
761						planes at 759.1, 759.7, 760.5 - clean &	
						smooth - polished.	
761.1 - 767.8	24	3 1/2 core	91.5	91.5		Tuffaceous Siltstone (grading locally to	
						a Tuffaceous Chystone); grayish orange	
						pink silt 5/8 to med. brn. silt 3/4, basally	
						silt w/ local increases in clay - calc. fine	
						to med. sand - mostly subrounded to rounded	
						grs, poor to well sorted, calc. to v. calc.,	
						laminated to thinly bedded, med. hard,	
						hrz. parting planes at 762.05, 762.9,	
						764.9, 765.05, 765.5, 766.6, 767.55, isolated	faces same as L. silt. thickly
						thin areas of med. oil content, parting	
						plane at 765.5 thickly coated w/ a	
						soft, white, massive mineral - lizzes silt,	
						but appears to be due to secondary calcite,	
767.8 -	24	3 1/2 core	100	100		Silty Chystone; lt. gray H-6 w/ calc. laminae	
776.15	+					lt. brownish gray silt 1/4, up to 40%+ silt,	
	25					poorly sorted, noncalc., laminated v. well	

NOTES:

funne

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/26/74 TITLE SUN-PHILLIPS - SON 10

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FAIRING 2500, 6 3/8" DIAMOND
B.t. Rotary/Air

LOGGED BY Lund/Siembiada

58

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
→ 776.15 (cont)	25		100	100	dev. non petroliciferous to silty v. silty petro- liferous, hard, hz. parting planes at 76.25, 768.5, 769.2, and 770.2, smooth to hackly fracture - some show effects of phyllosy. Additional planes at 771.48 773.28	
776.15 777.08	25		100	100	"oil shale" Olive black (5Y2/1) hard to very hard, thinly laminated, low silt % under 10%, very slightly calcareous poorly sorted, some thin tuff beds, minor distortion of bedding due to differential compaction, non-fractured NON-fossiliferous	
777.08 780.85	25		100	100	Siltstone: Pale brown (5YR 5/2) hard, thinly bedded, predominantly silt some clay size. Forams (25%), poorly sorted, slightly calcareous	

NOTES:

fuena

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. 74-068 P-3

DATE 10/26/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LW Air Rotary Drilling 500

LOGGED BY M. Siembicki

P. 59

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
→ 780.85 cont	28	28			some interbedded tuffs, that are porous, H ₂ S gas present, thin generally thin, with some .08 near bottom contact, parting planes at 777.58, 778.12, 779.29, 780.05, non fossiliferous. Non-fractured.	
780.85 786.77	28		100	100	"Oil shale" (silty claystone) Grayish brown (5YR ^{3/2}) to dusky brown (5YR ^{2/2}) hard to very hard, thinly laminated silt content ≈ 30% ± 10% poorly sorted, some fine-grains of pyrite, slightly calcareous. Low oil content to moderate oil content some welded vertical fractures parting planes at 781.20, 781.50, 782.43, 786.64	

NOTES:

7-23-73

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/26/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LW Air Rotary Drilling 2500 LOGGED BY M. Siembieda

P. 60

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
786.77	28				Tuff sandstone beds at	
cont					781.56 → 781.75, 781.85 (.05-.10	
					thick) 782.2-782.3, hard	
					fine to medium grain, porous	
					high oil content, massive	
786.77	28		100	100	Siltstone: dark yellowish	
794.88					brown 10YR 4/2 dusky brown	
					5YR 2/2, medium light grey	
					(N6) hard, laminated, grain	
					size varies from fine sands	
					to clay size, well sorted,	
					non-calcareous to slightly	
					calcareous, with dolomite	
					occurring, grains of pyrite,	
					and stringers of gilsonite	
					some tuff in siltstone, parting	
					planes at 786.36, 798.15	
					799.78. Occurring between	
					795.60 and 796.05, Tuffaceous	
					sandstone breccia, hard	

NOTES:

finna

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/26/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary Failins 2500

LOGGED BY M. Siembieda

.P 60

S.N. 10/26

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
799.85	28				grain size varies greatly	
cont					from fine sands to blocks	
					of tuff over 2' across.	
					Massive, very well sorted	
					locally calcareous, dolomitic	
					some calcite crystals (in	
					voids), non-fossiliferous,	
					porous, some vertical	
					fractures. Tuff grains seen	
					to "float" in sandstone ground	
					mass. H ₂ S gas present.)	
					very distinctive zone (probably	
					not a float)	
799.88 -	29				Oil shale: grayish black (1/2)	very
800.80					hard, thinly laminated, very	
					low silt < 10%, non calcareous	
					poorly sorted, non-fractured	
					moderate oil content	
					some very thin tuff bed	

NOTES:

frane

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/26/74 TITLE SUN-PHILLIPS-SONIA

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FAIRING 2500, 6 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY M. Siembida / BOS. & W.R. Lund / BOS.

61

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
800.80 805.80	29		100	100	Siltstone, moderate brown (SYR 3/4) to dark brown SYR 2 1/2. hard to very hard thinly laminated, moderate sorting (some clay particle 30% ± 10%) non-calcareous to slightly calcareous very low oil content. Parting planes at 803.34, 804.14 805.33. At bottom contain sandstone lenses hard grey, porous, medium-grain.	
10/27/74	W.R. Lund					
805.80-806.2					Petroliferous Claystone; "Oil Shale", blk N-1 to brnsh blk SYR 3/4, silt & clay of clay predominant - ratio difficult to determine due to abundance of bituminous material, poor to med. sorted, micaceous, thinly laminated - well dev., hard, non frac, strong petroliferous odor.	
806.2-806.65					Tuffaceous Silty Claystone; grayish orange	

NOTES:

frms

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. R-3

DATE 10/27/74 TITLE SUN-PHILLIPS-SAND

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FALING 2500 6 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R. LUND

62

RGD

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						to locally brinish blk. 5YR 3/4, silt-clay	
						40:60 to 50:50, poorly sorted, noncalc.	
						to silt calc., thinly laminated, hard,	
						noncalc, siltly, petroliferous	
806.63 - 811.27		3 1/2" CORE	100	100		Petroliferous Claystone-Siltstone "Oil Shale";	
						blk N-1 to ^{brinish} blk 5YR 3/4, w/ isolated	
						thin stringers grayish orange 10YR 7/6, abundance	
						of bituminous material makes it difficult	
						to determine if rock is claystone or silt-	
						stone - definitely somewhat petrolicious,	
						poorly sorted, noncalc. to v. siltly calc.,	
						laminated - well dev. ^{strong} petrolicious etc.	
						hard, parting planes at 807.32, smooth	
						to siltly irregular - coated w/ bituminous	
						material, between 808.16 and 808.9 are	
						5 thin (width = .06") buff zones w/	
						much lower petroleum content - the	
						shales around them have the highest	
						oil content of these intervals	
811.27 - 811.55		3 1/2" CORE	100	100		Petroliferous Siltstone - "Borderline Oil Shale"	

NOTES:

Turne

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/27/74 TITLE SUN-PHILLIPS - 30410

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED C-W FALING 2500, 6 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R. Lund

63'

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					grayish brown silt 3/4 to grayish red silt 1/2, silt & clay w/ silt predominance (somewhat lustrous), poorly sorted, calc., laminated, hard, nonstructured	
811.55-812.90		silt	75%	100	Petrolicious Claystone - "Oil Shale"; blk N-1 to blkish red silt 3/4, silt & clay	
					Passable Mahogany Bed: E. Genshan material ratio difficult to estimate due to abundant bituminous material, poor to mod. sorting, noncalc., thinly laminated - well dev., strong petrolicious odor, hard, hrs parting planes at 812.9 - v. irregular along contact w/ tuft zone (material somewhat lustrous)	
812.9-813.05		silt CORE	100	100	Petrolicious Tuft; pale brn silt 5/8 to dusky brown silt 3/4, v. fine to med grained, poorly sorted, silicious cement - makes indiv. grain identification difficult, poorly sorted, noncalc. to silt. calc. bedding v. conchoidal - roll structures, v. hard	
813.05-814.20					Petrolicious Claystone - "Oil Shale"; dusky brown silt 3/4 to grayish brown silt 3/4; silt	

NOTES:

THURS

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/27/74 TITLE SUN-PHILLIPS-SUNIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FAILING 2500, 6 3/4"
DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R. Lund

'64'

RQD

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					≈ 10-15%, med. to well sorted, calc., lam- inated - well dev., mod. petrolicious odor decreasing to silt. odor w/ depth - this zone appears to be a transition area from rich oil content above to marginal content below, hard, nonfrac.	
214.2-214.91		3 1/2 CORE	100	100	Silty Claystone "Border Line C15 shale"; dusky brn. 5YR 7/2 to pale brn. 5YR 5/2, 15- 25% silt, (possibly fullerous), poor to mod. sorting, calc., laminated, silt. to locally mod. petrolicious - this zone contains more oil than previously described claystone but much less than the "Oil Shales" directly above - rock is bordering & can be classed either way, below local increases in oil content - restricted to zones 4-5' in width - oil content picks up with depth & grades in to the oil shale below, nonfractured.	
218.91-222.3		3 1/2 CORE	50%	66%	Petrolicious Claystone "Oil Shale" very rich blk N-1 to brownish blk. 5YR 2/4, silt-clay mix.	

NOTES:

THURS

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/27/74 TITLE SUN- PHILLIPS - SONID

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FAIRING 2500, 6 3/8" DIAMOND BIT, ROTARY/AIR LOGGED BY W.R. Lund

'65

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						w/c by predominant - bituminous material makes determining ratio difficult, mod. to well sorted, noncalc., laminated - well dev. v. strong petroliferous odor, soft to mod. hard ~ 10' non recovery thin zone.	
822.30 - 822.90		3 1/2 CORE	100	100		Petroliferous Petroliferous Tuff; mod. brn. 5YR 7/4 to speckled white N-2, silt to mod. sand w/ abundant altered & devitrified? material, poorly sorted, noncalc., thinly bedded - upper and lower contact irregular (differential compaction) & possibly gradational, mod. hard to hard, somewhat porous, noncalc.	
822.92 - 823.24		5 1/2 CORE	100	100		Petroliferous Claystone - "Oil Shale"; blkish red 5R 7/2, 10-15% silt, mod. to well sorted, noncalc., laminated, hard, mod. to high petroliferous odor - definite oil shale though not as rich as above, hard, noncalc.	
823.24 - 823.69		3 1/2 CORE	100	100		Silty Claystone "Borderline Oil Shale"; grayish brown 5YR 7/2 to pale yellowish brown 10YR 4/2, silt 10-25%, poor to mod. sorting	

NOTES:

france

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/22/74 TITLE SUN. PHILLIPS-50410

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FALLING 2500, 6 7/8" DIAMOND
BIT, ROTARY/AIR

LOGGED BY W.R. LUND

86

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					noncalc. to silt. calc., laminated-well dev., silt to mod. petroliferous odor-rock is borderline w/ local increases in oil content, hard, hzs. parting plane w/ clean irregular surface at 829.8'	
829.69-830.25					Interbedded Silty Claystones & Petrolif- erous Claystones; blk N-1 to pale yellowish brown MYR 1/4, up to 30% silt, poor to well sorted, silt. to mod. calc., laminated w/ in horizons of similar rock type, thin to mod. bedded between horizons of differing rock type, hard, nonfrie.; rock has a banded appearance - some of the oil shale horizons are quite rich	
830.28-831.85	27	3 1/2 CLAY	100%	100%	^{Silty} Petroliferous Claystone - "Oil Shale"; mod. brn. SYR 1/4 to grayish brn. SYR 3/4 or brn. blk SYR 1/4, silt 20-30% gen., poorly sorted, stly calc., laminated-well dev. but commonly irregular (differential compaction, thin (.05') irregular buff lensed between	

NOTES:

fuena

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/27/74 TITLE SUN-PHILLIPS-SANJO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FAIRING 2500, 6 3/4"

LOGGED BY W.R. LUND

DIAMOND BIT, ROTARY/AIR

'67

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					531.0-531.05 & 531.11-531.15, "upper & lower	
					contacts wavy - mod. petroli ferous-silt,	
					porous, irregular frac. at 531.0 (full contact),	
					v. rough surface.	
531.05-535.05	27	3.5" CORE	100	100	Clayey Siltstone; lt. brn. silt 9/10 to mod.	
					brn. silt 9/10 & locally lt. gray at 7, silt &	
					clay = 60:40 or poss. 70:30 locally - rock	
					is close to borderline, poorly sorted,	
					mod. calc. to calc., laminated - well dev. &	
					regular, hard, nonfrag., may be bituminous.	
535.05-542.91	27	3.5" CORE	100	100	Petroli ferous Claystone "O.I. Shale" grayish	
					red silt to locally grayish blk. N-2, gen. 10-E silt.	
					silt however certain laminae may approach	
					50:50 locally, poor to mod. sorted, noncalc. -	
					mod. calc. w/ depth, laminated - well dev. -	
					gen. regular though locally differentially compacted,	
					hard, horz. parting planes at 539.35, 540.35,	
					smooth & clean; rock is med. to low grade	
					silt shale.	
542.91-548.61	27	3.5" CORE	100	100	Interbedded Clayey Siltstone & Silty Clay shale.	

NOTES:

THURS

FIELD LOG OF BORING

PROJECT NO. 74-06B

BORING NO. P-3

DATE 10/27/74 TITLE SON-PHILLIPS-SONID

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-45 DRILLING 2500, 6 7/8" DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R. LUND
68

R9D						
DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows of Force	Recovery, Condition		
					alternating laminae v. greatly in silt-clay ratio - several laminae exposed on fresh surface are 0.01' thick and alternate back & forth, poor to well sorted, silt. calc. to mod. calc., thinly laminated - well dev. silt. petroliferous, hard, hrs. parting plane at 845.32	
844.81-849.55	27	3.5" CORE	100	100	Petroliferous Claystone - "Oil Shale"; bluish red 5R 4/2 to v. dusky red 10R 4/2, 10-15% silt, mod. to well sorted, mod. calc., laminated, mod. petroliferous, thin (0.02') petroliferous silt stringer at 849.25 - irreg. contact w/ rock above & below, hrs. parting plane at 849.25.	
849.55-850.88	27	3.5" CORE	100	100	Silty Claystone "Borderline Oil Shale", mod. brn. 5YR 4/4 to grayish brn. 5YR 3/2, 15-30% silt, poor to mod. sorted, silt. calc., laminated, silt. to mod. petroliferous - borderline, hard, nonfract	
850.88-854.11	27	3.5" CORE	54%	91%	Tuffaceous Claystone w/ frequent siltstone laminae;	

NOTES:

Turner

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/27/74 TITLE SUN-DWILERS-SAND

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W, FAIRING 2500, 1 3/8" DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R. Lund

69

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						pinkish gray 5YR 8/1 to locally grayish red 5R 4/2, pale yellowish brown 10YR 6/2, mod. brown 5YR 3/4, mod. to well sorted, mod. calc. to calc., laminated to thinly bedded, well dev., mod. hard to hard, parting planes abundant - core loss this run assigned to this interval.	
854.11-856.21	27	3.5 CORE	100	100		Petrolicious Claystone; "Oil Shale", bluish red 5R 4/2 to grayish brown 5YR 4/2, 15-25% silt, poor to mod. sorting, mod. calc., laminated; well dev., mod. petrolicious - low to mod. quality, hard, nonfractured	
856.20-856.55	27	3.5 CORE	100	100		Petrolicious Tuff; grayish brn. 5YR 4/2 to lt. brn. 5YR 4/1 & v. lt. gray 4-8, v. fine grained - occ. sand, poorly sorted - both of above difficult to estimate due to bitumen content, noncalc. to v. silty calc., thinly bedded, porous, irregular surfaced parting plane marks upper contact (856.20')	
856.55-857.69	27	3.5 CORE	100	100		Claystone; grayish red 10R 4/2, 5-10% silt	

NOTES:

Turn

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/27/74 TITLE SUN-PHILLIPS - 50410

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W, FAIRING 2500, 6 3/4"

LOGGED BY W.R. LUND

DIAMOND BIT, ROTARY/AIR

70

RQD

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blow Force	Recovery, Condition		
					well sorted, rounded to thinly bedded, or	
					or tabular to v. silty, petaliform, matrix.	
857.62-857.41	27	3.5 CORE	110	100	Petaliform Chert, "Oil Shale", bluish red	
					50% to brownish blk. 540 ft, 10-15% oil,	
					and to well sorted, silty, to mud calc.	
					laminated - well dev., mud to hard, petaliform	
					content, hard, massive.	
857.41-					Chert, brownish gray 510 ft, also gray 510 ft,	
861.84					to dk. gray, 8-9 - each laminated in a diff.	
					color from blue on either side, 8-10 ft.	
					slk, well sorted, some v. silty calc., rounded,	
					matrix, petaliform to v. silty, petaliform, hard	
					matrix, fracturing, lower at 860.9	
					861.85	
861.84 -	28		100	100	"Oil shale" silty fine to med,	
862.94					yellowish brown to yk 3/4	
					hard, thinly laminated, med,	
					calcareous, later bedded	
					to ffs, moderate to med. content	
					non-fractured	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/27/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary Failing 2500

LOGGED BY M. Siembieda

S.A. 10/27

RQD

Pg-71

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows by Force	Recovery, Condition		
862.94	28		100	10	Silty claystone: dark yellowish brown (10YR 4/2) hard, thinly laminated, silt content 30% ± 10%, moderately calcareous, moderately sorted, some fine pyrite crystals parting plane at 863.21	
864.30					Non-fractured, non-fossiliferous very low oil content	
864.30	28		100	100	Siltstone (marlstone?) pale yellowish brown 10YR 6/2, hard	
868.23					thinly bedded to laminated generally silt with some clay highly calcareous, non-fractured non-fossiliferous, parting planes at 865.14 866.95	
868.23	28		100	100	Silty claystone: dusky yellowish brown 10YR 2/2, hard thinly laminated silt content 30% ± 10%, moderately calcareous, inclusions of	
869.00						

NOTES:

7-20-75

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/27/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary Failing 2500 LOGGED BY M. Siembieda

S.A. 10/27

72

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
→ 869.00	27				gilsonite and nacholite	
cont					low oil content, parting plane at 868.3	
869.00	28		0	100	Tuff Sandstone: Moderate	
870.42					Yellowish brown 10YR 5/4	
					hard, medium to coarse grain massive, slightly calcareous, high oil content	
					"drips" oil, porous, some vertical fractures	
870.42	28		100	100	Siltstone: Very pale	
891.46					orange 10YR 8/2 to dark yellowish brown, hard	
					laminated some color banding (may appear to be different lithology) some low clay to generally highly calcareous with some slightly calcareous zones, fine grained pyrite and veins in core, tuffaceous	

NOTES:

T-1000

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 9/27/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary Drilling 2500

LOGGED BY M. Siembieda

73

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
cont	27				material in the the siltstone	
891.46					parting planes at 873.50	
					874.15, 875.46, 877.45	
					881.70, 882.04, 884.53	
					885.45, 887.50. At 885.7	
					(.1' thick) and 884.1 (.03' thick),	(891.15 → 891.46)
					oil impregnated tuff, very	
					high oil content, seeping	
					from core, sticky. Silt	
					stone become more massive	
					and contains some fine sands at depth	
891.46	28		100	100	silty claystone: Pale yellowish	
895.96					brown 10YR 6/2 hard, thinly	
					laminated, silt content 30-40%	
					moderately sorted, moderately	
					calcareous, fine pyrite	
					crystals, some oil in	
					tuff seams, parting plane	
					at 892.95, non-fractured	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/27/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-10 Air Rotary Drilling 2500

LOGGED BY M. Siembieda

74

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows of Force	Recovery, Condition		
895.96	29		100	100	Shale: Pale yellowish brown	
897.34					(10YR 6/2) to Grayish brown 5YR 3/2	
					hard, interbedded to FFs,	
					thinly laminated, poorly sorted	
					slightly calcareous, FFs	
					are oil impregnated, with	
					oil dripping out of face,	
					parting plane 896.06,	
					897.09, 897.34, non-fractured	
897.39	38		100	100	Sandy siltstone medium light	
913.10					grey (W6) grayish orange pink	
					(5YR 7/2) hard, laminated	
					Moderate sorting, very very	
					fine sands, decreasing	
					grain size at depth	
					grading into a shale, slight	
					calcareous, fine grained	
					crystals of pyrite, marcasite	
					hematite, a few oil impregnated	
					tuffs, homogeneous, parting	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/27/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W - Air Rotary

LOGGED BY M. Simon Brede

75

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
→ 912.10	28				plane at 899.88, 902.87	
cont					906.00, 909.25	
913.10	29		100	100	Shale: Grayish brown (5YR 3/2)	
915.74					to black (M) hard, laminated	
					poorly sorted, slightly to	
					non-calcareous, from 913.10	
					to 914.69 low oil content	
					and 914.69 → 915.74 moderate	
					oil content. some interbedded	
					clastic. Parting planes at	
					914.16 and 914.89	
915.74	29		100	100	siltstone moderate brown	
918.45					(5YR 5/4) hard, thinly laminated	
					poorly sorted, predominantly	
					silt, slightly to highly	
					calcareous, very thin	
					beds of pyrite/marcasite	
					very homogeneous throughout	
					Non-fractured	

NOTES:

FIELD LOG OF BORING

PROJECT NO: 74-068 BORING NO. P-3
 DATE 10/27/74 TITLE _____ ELEVATION _____ DATUM _____
 START _____ COMPLETE _____ WATER LEVEL _____ AFTER _____
 EQUIPMENT USED L-W Air Rotary Faling 2500 LOGGED BY M. Siembieda

76'

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Forcs	Recovery, Condition		
918.45 - 920.82	29 29		100	100	Silty Claystone Moderate brown SYR 3/4 hard, thin bedded to laminated, some color banding, silt content ~25% ± 10% slightly calcareous fine grained pyrite, some gilsonite stringers, some distortion of bedding caused by differential compaction non-fractured	
10/28/74 920.82-921.00	10. R. Land 29	35 CORE	100	100	Tuffaceous Silty Sandstone; pale brn. SYR 1/2, v. fine qtz sand & coarse silt, subangular, poorly sorted, v. silty calc. hard to v. hard, silt. pores, microporosit- erous, upper & lower contacts v. flat - lower contact marked by horz parting plane	
921.00-921.91	29	35 CORE	100	100	Petroliferous Claystone; grayish red SR 1/2, 5-10% silt, well sorted, silt. calc., laminated. well developed petroleum content, nonfract	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 14-069

BORING NO. P-3

DATE 10/20/77 TITLE THIN-SILLS - SAND

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED 5-10 TAILING 2500, 6 3/4" DIAMOND
Bit, ROTARY/AR

LOGGED BY W.R. LUND

77

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blow ct/ Feet	Recovery, Condition		
921.01-921.52	28	3.5 CORE	100	100	Tuffaceous Silty Sandstone; pale brn SYR 1/2, v. fine grs sand & coarse silt, subang., poorly sorted, v silt. calc., thinly bedded, hard, nonfrag., nonpetroliferous.	
921.52-922.35	29	3.5 CORE	100	100	Silty Claystone; pale yellowish brn. 10YR 4/2, pale brn. SYR 3/4 and med. lt. gray N-6, 20-30% silt, poorly sorted, silt. to med. calc., laminated - well dev, nonpetrolif. cross to locally silty petroliferous, hard, nonfrag.	
922.35-923.50	29	3.5 CORE	100	100	Petroliferous (Tuffaceous?) Silty Sandstone - Sandy Silty line, grayish blk. N-2 to med. dk. gray N-4, bitumen content makes it diffi- cult to estimate silt-sand ratios - silt appears to be high, poorly sorted, silt. calc., thinly bedded, hard, nonfrag.	
923.50-925.11	29	3.5 CORE	100	100	Petroliferous Claystone "Boulder line Cut Stnk", med. lt. gray N-5 to pale red SYR 1/2, 15- 20% silt, poorly sorted, silt. calc., lamin- ated - well dev, petroleum content is	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/23/74 TITLE SUN-PHILLIPS-SONIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W, FAIRING 2500, 6 3/8 DIAMOND BIT, ROTARY/AIR

LOGGED BY WILL LUND

79

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					low to med-rock could be grouped in material directly below, irregular rough surfaced fracture at 929.35'	
925.11-927.12	28	3.5 CORE	100	100	Claystone; grayish orange pink 5YR 7/2, pale yellowish brown 10YR 6/2, & lt. gray N-6, <10% silt, well sorted, silt. c. c., thinly laminated, micropelitic, brown to locally silty petroclites, hard, nonfrag.	
927.12-927.35	29	3.5 CORE	100	100	Petroclitic (Tuffaceous?) Siltstone; blk N-1 to grayish blk N-2, v. high petroclitic content - unable to discern indiv. grains or est. sorting, v. silty ^{c. c.} , thinly bedded, hard, nonfrag.	
927.35-934.15	29	3.5 CORE	100	100	Silty Claystone; pale brown 5YR 7/2, to lt. gray N-6, 15-30% silt (varies considerably), poor to med sorting, silt. c. c., laminated, micropelitic, brown to silt. petroclitic locally, hard, hrs. parting planes at 927.40', 929.0', 930.91', thin 1' tuff stringer 14. brown 5YR 6/4 in irregular ^{bedded} contacts between 930.50 and 930.59.	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/28/74 TITLE SUN - PHILLIPS - SENIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W, FAIRING 25-20, 6-7/8 DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R. LUND

79

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows of Force	Recovery, Condition		
934.15 - 935.19	29	3.5 CORE	100	100	Petroliferous Claystone; brownish blk silt to dusky brown silt, 5-10% silt, well sorted, noncal, laminated - well dev & regular, med. to high petroleum content, hard, noncal.	
935.19 - 935.34	29	3.5 CORE	100	100	Petroliferous Tuffaceous Sandstone; grayish brn. silt (indistinct streaks) & dk. gray N-3, silt 30-40%, sand predom. subbed to rounded grs, poorly sorted, noncal, thinly bedded, med petroleum content, hard, bez. parting plane at 935.33	
935.34 - 936.09	29	3.5 CORE	93%	100	Claystone - Silty Claystone; v. dark red silt pale brown silt, bluish red silt & pale reddish brown silt (v. colorful var.), 5-20% silt (varies), med. to well sorted, noncal, to silt. calc, laminated - well dev. - alter- nating laminae are diff. colors, generally nonpetroliferous - heavily silt, petroliferous, hard, bez. parting planes at 936.30, 936.70, 936.95 937.27, 937.35	
936.09 - 936.54					Petroliferous Eldystone - "Oil Shale", dusky brn, silt	

NOTES:

7-23-75 L.C.C.

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/22/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED C-10, SOILING 2500, ⁶⁷⁴DIAMOND BIT,
ROTARY/AIR

LOGGED BY W. R. LUND
80

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					to bluish red $5R^{7/2}$, 10-15% silt, mod. to well sorted, oolitic, laminated - well dev., mod. petroliferous w/finely disseminated b. luminescent material, hard, nonfract.	
943.94-944.42	29	$3\frac{1}{2}$ " CORE	100	100	Tuffaceous Sandy Siltstone, med gray N-5 w/irregular streaks of mod. brn. $5YR^{3/4}$, \pm 35% v. fine gtz sand, poorly sorted, mod. calc., thin to med. bedded, silt. petroliferous, upper & lower contacts smooth to wavy, more porous than claystone, silt. friable	
944.42-946.71	29	$3\frac{1}{2}$ " CORE	100	100	Claystone-Silty Claystone, mod. brn. $5YR^{3/4}$ to grayish orange pink $5YR^{7/2}$, 10-30% silt (varies), poor to well sorted, mod. calc. to calc., laminated - well dev & regular, non-petroliferous to silt. petroliferous except for two thin horizons between 944.80 & 944.95 hrs. parting plane at 944.8	
946.71-949.25	29	$3\frac{1}{2}$ " CORE	100	100	Petroliferous Claystone - Oil Shale, bluish red $5R^{2\frac{1}{2}}$, 10-15% silt, poor to med. sorting, mod. calc., laminated - well dev., hard - nonfract. mod. petroliferous.	

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FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/25/79 TITLE SON - PHILLIPS - SONIC

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-10, FEILING 2500, 6 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY W.R. LUND

51

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows Force	Recovery, Condition		
949.25-949.60	27	3 1/2" CORE	92%	90%	Tuff- Tuffaceous Sands fine, med. yellow brown 10YR 5/4, v. fine to med. grained subrounded to rounded qtz. sand grains in a coarse qtz silt ± 15% matrix w/ occ. isolated macules (biotite?), silt. calc., bedding indist. or contorted, stl. petroliferous, porous, somewhat friable, - sticky, bituminous material in some pores, irreg.	
					Trac. at 949.3 = 0'015'	
949.60-951.61	29/130	3.5" CORE	100% 99.5%	100	Petroliferous Claystone - "Oil Shale"; grayish blk. N-2, 10-15% silt, med to well sorted noncalc., laminated - locally disturbed, highly petroliferous, hard, parting planes at 950.35, 950.90, 951.21 - bedding near lower contact, contorted & bent	
951.61-952.62	30	3.5" CORE	82%	100	Silty Claystone; med. dk. gray N-4 to pale brn. 5YR 5/2, 10-30% silt, med to well sorted (varies up to laminar), noncalc. for silt. calc., laminated - well dev. & regular, nonpetroliferous, hard, hrz. parting planes at	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 79-068

BORING NO. P-3

DATE 10/20/74 TITLE SUN-HILLS - SCH10

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FAIRING 2520, 6 3/4" DIAMOND BIT, ROTARY/AIR LOGGED BY W.R. Lord

82

RCD

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blow C/ Feet	Recovery, Condition		
					952.24 & 952.68	
952.68-954.05	30	3.5" CORE	95%	100%	Petroliferous Claystone; (Oil Shale); blkish red SR 1/2, blk N-1, & lt. olive gray SY 1/2, 10-15% silt, med. to well sorted, noncalc. to v. silt. calc., laminated - well dev. - locally contorted, highly petroliferous, hard, irregular surfaced parting planes at 953.7 & 953.85, ltly. coated w/ calcite.	
954.05-957.62	30	3.5" CORE	23%	87%	Silty Claystone - Shale; lt. olive gray SY 6/11, pinkish gray SY R 1/11, 5-15% silt, med. to well sorted, noncalc. to silt. calc., laminated, med. hard to hard, 24' NONRECOVERY ASSIGNED to this interval, core is broken into numerous "silver dollar" pieces .15' to .23' in width. non-petroliferous.	
957.62-960.88	30	3.5" CORE	90.5%	100%	Petroliferous Claystone - Oil Shale; grayish blk N-2 to dk. gray N-3 or blkish red SR 1/2, 5-10% silt, well sorted, noncalc., laminated - dev. locally see effects of differential compaction - pinch & swell - minor offsets etc.	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 12/23/74 TITLE SOIL-PHILIPS - SUHIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-10 FALLING 2500 6 3/4" DIAMOND
BIT, ROTARY/AIR

LOGGED BY W. R. L. and

83

DEPTH	SAMPLES					DESCRIPTION
	No.	Type	Blows Force	Recovery, Condition		
						hard, hrz. parting planes at 952.91, 959.41, 959.61, 960.0, 960.20 (assoc. w/ v. thin silt sh. at 961.75)
961.28-964.35	30	3.5" CORE	100	100		Claystone - Silty Claystone; brnish gray 5YR 4/1 to mod. brn. 5YR 3/4, 10-20% silt, mod to well sorted, v. silt. calc, laminated - well dev., silt. petroliferous, hard, hrz. parting planes at 962.53, 963.25, 963.73, fine at 15" at 964.19
964.35-966.17	30	3.5"	100	100		Petroliferous Claystone - "Oil Shale"; blk w/ to blkish red 5YR 2/2 or v. dusky red 10YR 4/1 5-10% silt, well sorted, noncalc, highly petroliferous w/ abundant finely disseminated bituminous flks, laminated - upper 1' highly bedded - offsets, roll structures, etc., hard, hrz. parting planes at 964.72, 965.25
966.17-971.92	30	3.5"	100	100		Silty Claystone - Shale; brnish gray 5YR 4/1 mod. brn. 5YR 3/4, pinkish gray 5YR 6/1, 10-20% silt, poor to mod. sorting, mod calc, laminated - well dev. & regular - small "mud cracks"

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. 2-3

DATE 10/23/71 TITLE SUN-PHILLIPS - 50410

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L.W. FAIRBANKS 2500 6 3/8" DIAMOND BIT, ROTARY/AIR LOGGED BY W. R. LUND

ES

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						brucina .05' a/c at 969.40', orange-liteneous to silt petroliferous, hard, bez parting planes at 966.75, 966.50, 967.55, 968.25, 968.50, 969.25, 970.12, 970.70, & 971.25 - rx. shows def. tendency to split along bedding when struck w/ hammer (paper thin)	
971.52-973.50	20	3.5" GSE	100%	100%		Petroliferous Claystone - "Oil Shale", blk N-1 to olive gray 5Y 4/1, 5-10% silt, well sorted, noncalc., laminated - localized pinching & swelling, highly petroliferous - 972.34-972.40 oozes a stiff tar like substance - v. sticky, hard, irreg. surfaced parting planes at 972.90 & 973.50 - clean.	
973.52-975.21						Claystone - Silty Claystone - "Borderline Oil Shale", olive gray 5Y 4/1 to brnsh gray 5YR 4/1, 10-20% silt, mod. to well sorted, v. silty, calc., laminated - indistinct, silt. to mod petroliferous w/ occ. v. fine flks. of bituminous material, hard, bez parting	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-066

BORING NO. P-3

DATE 10/26/74 TITLE SUN-1 11125PS - 50110

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FAIRING 2500 6 3/4" DIAMOND BIT, ROTARY/AIR LOGGED BY W. P. L. 2

DEPTH	SAMPLES					DESCRIPTION
	No.	Type	Blows or Force	Recovery, Condition		
						pieces of 977.93, 978.36, 979.91
975.21-976.12						Retrolithous claystone - "Dil Shale" lit. N-1 to dusky yellowish brn. 10-12% silt - difficult to extract due to high oil content, well sorted, calc., laminated - beds very con. bed - off sets of 1'-2', well structures, very petroliferous - long clay hard, con. bed.
976.12-980.90	30	3.5" CORE	74%	100%		Silty claystone; med. to gray N-1 to gray brown 5-12% (near oil shale directly above), 10-35% silt (varies), poor to locally well sorted, silt, calc. to med. calc., lamination indistinct, con. to locally silty, petroliferous, hard, pet. frag. pieces at 977.05, 977.50, 977.30, 977.80, 978.20, 978.50, 978.80, 979.10, 979.45, 979.53
980.90-985.03	31	2.5" CORE				Interbedded Silty Claystones and sandy clay siltstones; 1'-2" med. to thick bedded between rock types (range from 1'-2' to > 3.5') but the claystones are fine grained

NOTES:

FIELD LOG OF BORING

PROJECT NO. 21-068

BORING NO. 21-068

DATE 4/23/74 TITLE 21-068 - 21-068

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED 4" - 1/2" - 1/4" - 1/8" - 1/16" - 1/32" - 1/64" - 1/128" - 1/256" - 1/512" - 1/1024" - 1/2048" - 1/4096" - 1/8192" - 1/16384" - 1/32768" - 1/65536" - 1/131072" - 1/262144" - 1/524288" - 1/1048576" - 1/2097152" - 1/4194304" - 1/8388608" - 1/16777216" - 1/33554432" - 1/67108864" - 1/134217728" - 1/268435456" - 1/536870912" - 1/1073741824" - 1/2147483648" - 1/4294967296" - 1/8589934592" - 1/17179869184" - 1/34359738368" - 1/68719476736" - 1/137438953472" - 1/274877906944" - 1/549755813888" - 1/1099511627776" - 1/2199023255552" - 1/4398046511104" - 1/8796093022208" - 1/17592186044416" - 1/35184372088832" - 1/70368744177664" - 1/140737488355328" - 1/281474976710656" - 1/562949953421312" - 1/1125899906842624" - 1/2251799813685248" - 1/4503599627370496" - 1/9007199254740992" - 1/18014398509481984" - 1/36028797018963968" - 1/72057594037927936" - 1/144115188075855872" - 1/288230376151711744" - 1/576460752303423488" - 1/1152921504606846976" - 1/2305843009213693952" - 1/4611686018427387904" - 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FIELD LOG OF BORING

PROJECT NO. 1406B

BORING NO. _____

DATE 10/20/71 TITLE SOIL-BITUMENS-SOLIDS

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED 2-1/2" FAIRING 2500 6 3/4" DIAMOND

LOGGED BY _____

3 ft, Rotary/AIR

87

DEPTH	SAMPLES				DESCRIPTION
	No.	Type	Blows or Feet	Recovery, Condition	
					bedding broken by an occasional claystone horizon which is generally 4-1' thick
					non petroliferous, hard, parting planes at
					985.65, 985.93, 986.82, 987.20, 987.50, 987.96,
					988.35, 988.93, 989.65, 990.00, 990.03, 990.80,
					992.16, 993.7, 994.3 - most faces are smooth
					and polished to 1.6' of non recovered
					core has been assigned to ⁹⁹³⁻⁹⁹⁴ 993-994
					half that is in this interval.
995.03					Silty Claystone - Clayey Siltstone; lt. olive gray 54% to yellowish gray 54%, silt sand content shifts rapidly both claystones and siltstones present as fine laminae, poor to well sorted, red calc. to v. calc., laminated - well dev. - closely resembles the laminated claystones uphole - perhaps the best term for this rx would be shale - since alternating laminae have such a range in grain size and sorting, non petroliferous, hard, parting planes at
995.03 - 1002.59					

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/23 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED Hy-Air Rodding Rig 2500

LOGGED BY M. Sjoerdsma

P. 88

DEPTH	SAMPLES				DESCRIPTION
	No.	Type	Blows or Force	Recovery, Condition	
					998.44, 999.31, 1000.25, 1000.90, 1000.70,
					1002.59
1002.50	31		160	100	Siltstone: dark yellowish brown
1004.30					10YR 4/2, hard, laminated.
					75% silt 25% clay, very slight
					calcareous, some tuffaceous
					material present, some
					gilsonite stringers, poorly
					sorted, parting planes oil
					1002.74, 1003.53 non-fractured.
1004.30	31		100	100	"Oil shale" (claystone) black (oil)
1007.45					dark brown 5YR 2/2, hard
					finely laminated, low silt %
					< 15%, non-calcareous, poorly
					sorted, some tuff stringers
					moderate oil content, parting
					planes oil, 1004.30, 1004.80
					1005.13, 1006.29, 1007.73
					Non-fractured, non-fossiliferous

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068 BORING NO. P-3
 DATE 10/30/74 TITLE _____ ELEVATION _____ DATUM _____
 START _____ COMPLETE _____ WATER LEVEL _____ AFTER _____
 EQUIPMENT USED L-W Air Rotary Drilling 2500 LOGGED BY M. Sienkiewicz

87 P. 89

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1007.45	31		95	100	Siltstone, Pale yellowish brown	
1012.34	32				10 YR 6/2, medium bluish grey	
					SB 5/1, hard, some fine sand	
					and clay material, thin bedded	
					to laminated, moderate sorting	
					moderate to highly calcareous	
					stringers of tuff, veins	
					of fine-grained pyrite	
					parting planes at 1007.64	
					1007.87, 1008.41, 1009.35	
					1011.08, 1011.37, 1011.77	
					becoming more sandy at depth	
1012.34	32		75 100	100	Silty claystone: dusky yellowish	
1016.43					brown 10 YR 2/2, hard, faint bedding	
					but appears laminated silt	
					content 25-35%, poorly sorted	
					slightly calcareous, tuffaceous	
					material in claystone, parting	
					planes at 1012.59, 1013.83	
					1014.42, 1015.44, Tuff sandstone	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/25/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary Drilling 2500

LOGGED BY M. Siembicki

90

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
cont'	32				beds at 1015.3 (.1' thick) and 1016.3 (.07' thick) medium to coarse grained, porous, highly calcareous, hard	
1016.43	32		57	100	Sandy siltstone. Very pale orange	
1017.85					10YR 8/2 to pale yellowish orange	
					10YR 6/2, moderately hard to hard	
					medium to thin bedded, moderate sorting ~65% silt ~25% fine sand, ~10% clay, highly calcareous	
					comprised mostly of tuffaceous material, parting plane at 1016.94, 1017.25, 1017.73	
					non-fractured, non-fossiliferous	
1017.85	32		96	100	Claystone: dark grey (N3)	
1022.19					hard, bedding faint but is laminated silt content low >20%	
					poorly sorted, moderately calcareous, some tuffaceous material in claystone, parting	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/23/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-V Air Rotary Failing 2500

LOGGED BY H. Siembieda

9/

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
cont	32				planes 1018.55, 1019.00, + 1019.45, 1020.79, 1022.18 1022.24 non-fractured - Gradational Contact -	
1022.19	32		45	65	Siltstone very pale orange (10 YR 8/2) moderately hard to hard, thin bedded to massive some fine sands (15%) and clay (20-30%) highly calcareous parting planes at 1022.34 1022.50 1024.37, non-fractured non-fossiliferous, non-fractured	
1024.48	32		100	100	Silty claystone olive grey 5Y 1/2 hard, bedding faint, laminated some silt < 15%, slightly calcareous, some fine grained mice, ^{mod} poorly sorted, very homogeneous, Parting Planes at 1025.00, 1026.01 1026.63, 1028.75 1029.33, 1030.11, 1030.94, 1031.73	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068 BORING NO. P-3
 DATE 10/31/74 TITLE _____ ELEVATION _____ DATUM _____
 START _____ COMPLETE _____ WATER LEVEL _____ AFTER _____
 EQUIPMENT USED 1 1/2" Air Rotary Drilling 2500 LOGGED BY M. Siembieda

92

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
cont'	32				1032.42, 1033.00, 1034.00 1035.03, 1036.08, 1037.25 Non-fractured, non-fossiliferous	
1037.51 1038.50	32		100	100	Siltstone very pale orange 10 YR 8/2, hard, thin bedded to massive, clay 25% some fine sands, highly calcareous parting plane at 1037.70 Non-fractured; non-fossiliferous	
1038.50 1039.79	32 33		100	100	Claystone: Olive grey 5Y 4/1, pale brown hard, laminated, poorly sorted (little silt 710%) ; slightly calcareous, very homogeneous non-fractured non-fossiliferous pyrite occurs in pockets and as veins Parting plane at 1040.57, 1040.88, 1042.70 1044.04, 1044.71, 1046.64 some tufaceous material in clay stone	15YR 2

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/25/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LW - Air Rotary Drilling 2500

LOGGED BY M. Sienkiewicz

RQD

93

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows Force	Recovery, Condition		
1053.79 1053.79	33		100	100	Marls tone (and interbedded tuffs) light grey (N7) very pale orange (10YR 8/2) moderately hard to hard, thinly bedded to medium bedded, poorly sorted, very highly calcareous, some offset in bedding up to .05' displacement and traces up to 3', some zones of mica occur, locally high % parting plane at 1056.18 bottom contact appears gradational. Tuffs are oil impregnated, "dripping oil" highly calcareous hard, occur in upper 1/2 of zone unit	
1057 (gradational)						
1057-3'	33			100	Silty claystone: medium grey (N5), Pale yellowish brown 10YR 6/6 hard, laminated, silt content varies from 15-30%, poorly sorted at 1057.59 moderately	
1081.59						

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068 BORING NO. P-3
 DATE 5/30/74 TITLE _____ ELEVATION _____ DATUM _____
 START _____ COMPLETE _____ WATER LEVEL _____ AFTER _____
 EQUIPMENT USED LW Air Rotary Drilling 2500 LOGGED BY H. Siembieda

94

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1057 - ? cont'	33		100	100	Calcareous, some interbedded with (thin) pyrite occurs disseminated throughout rock, unit is very homogeneous, partings plane at 1057.81, 1059.85, 1062.75, 1066.71, 1066.89, 1067.25, 1067.33, 1067.42, 1081.01	
1081.59	34				pyrite occurs in veins and vugs (1075.32, 1078.04, 1078.37, 1080.12, 1080.35, thin veins occurs)	
1081.59 1084.65	34		98	100	Marlstone (some interbedded claystone) Very Pale orange (10YR 8/2) dark yellowish brown (10YR 4/2) moderately hard to hard, generally silt to clay size particles but some very fine quartz sand lenses also included, moderately sorted, laminated to medium	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068BORING NO. P-3DATE 6/30/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LW Air Rotary Fairline 2550LOGGED BY M. Siembieda

95

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1081.59	36				bedded, some color banding	
1084.65					contacts are gradational	
cont'					parting plane at 1082.68	
					1082.78, 1083.02, 1083.08	
					1083.23, 1083.77, 1084.12	
10/29/74	W.R. LUND					
1084.65-1090.12		3.5 CORE	100	100	Silty Claystone; dusky brn. 5YR ⁷ / ₂ to brnish gray 5YR ⁴ / ₁ , 15-30% silt, med to mod sorted, porous, laminated - well dev. conglomeratic to silt. petioliferous, hard, hrz. parting plane at 1087.74, described p. 1	
1090.44-1090.59		3.5 CORE	100	100	Tuff-Tuffaceous Siltstone; med dk gray N-4, coarse silt and v. fine sand - predom. subeq. to subrounded gts. w/ abundant platy fine flts of biotite, porous, indist. fine bedded, hard, irregular faced frs. at 1090.44.	
1090.59-1091.50		3.5 CORE	100	100	Petroliferous Claystone, (Oil Stk.); dusky brown 5YR ⁷ / ₂ , 10-15% silt, med to well	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/29/74 TITLE SUN-PHILLIPS-SNH

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W, FAIRING 2500, 6 3/4" DIAMOND
BIT, EXHAUST/AIR

LOGGED BY W.R. Lund

P. 96

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						sorted, v. silty calc., laminated - well dev., hard, non fractured.	
1094.58 - 1094.97		3.5" CORE	100	100		Silty Claystone - "Borderline Oil Shale" bluish red SR 2 1/2, 5-10% silt, well sorted, abundant disseminated pyrite, v. silty calc., laminated - well dev. - locally part and swell structures, hard, non frac.	
1094.97 - 1095.33		3.5" CORE	100	100		Tuffaceous Petroliferous Claystone - "Oil Shale" bluish red SR 2 1/2 to grayish orange RYR 70 - appears streaked along indiv. laminae, 30-40% silt in more tuffaceous zones, lower ± 10-15% in petroliferous zones, fair to mod. sorting, v. calc. acid produces violent fizzing, mod. petroleum content, hard, laminated well dev & regular - lower contact marked by an irregular surfaced horz. parting plane.	
1095.33 - 1097.43		CORE, 3.5"	100	100		Sandy Siltstone; lt. gray N-6, subang to submed v. fine grs sand & coarse grs silt w/ acc. platy matrix (biotik?), sand-silt ratio approx. 25:75, poorly sorted, calc.,	

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/29/74 TITLE SUN-PILES - SCUB

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L.W. FAIRING 2500, 6 3/4" DIAMOND
CORE, ROTARY/AIR

LOGGED BY W.R. LUND

200

97

DEPTH	SAMPLES				DESCRIPTION		REMARKS
	No.	Type	Blows or Force	Recovery, Condition	Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:		
						laminated-frequently contorted, non-petroliferous except for local concentrations of bituminous material on some fractures (material), hard, non-laminar, fresh surfaces have a sacrocidal texture - (caliche)	
1097.43-1102.95	35/39	CORE 11 3.5	100	100	Silty Claystone; lt. gray N-6 to lt. olive gray 5Y 4/6, 10-20% silt, med to well sorted, calc., laminated - well dev. to indistinct, silty, petroclitic, hard, hrz. parting planes at 1099.80, fresh faces have a sacrocidal texture (caliche), med. disseminated pyrite, additional parting planes at 1101.69 & 1102.93		
1102.95-1107.12	39	CORE 2.5	88%	100	Tuffaceous Claystone & Sandy Claystone; pale yellowish brn. 10YR 6/2, grayish orange 5YR 7/2 to v. pale orange 10YR 8/2, 10-15% silt locally sand > 10% but rare, well sorted, med calc to calc., laminated to thinly bedded - regular in upper portion of horizon but v. contorted in lower horizon - offsets, bending etc., silty petroclitic to locally med. petroclitic (fine)		

NOTES:

FIELD LOG OF BORING

PROJECT NO. 74063

BORING NO. R3

DATE 10/24/79 TITLE SUN-PHILLIPS-30110

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W, FAIRING 7500 6 3/4 DIAMOND BIT, ROTARY / AIR

LOGGED BY W. R. Lind

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RQD

DEPTH	SAMPLES				RECOVERY, Condition	DESCRIPTION Soil type, color, consistency, moisture condition, grain-size distribution, bedding, geologic details:	REMARKS
	No.	Type	Blows Force				
						hrz. parting planes at 1103.20, 1103.31, 1104.20	
						1104.30, 1104.59, 1106.30, 1107.12	
1107.12-1109.58	37	3.5 CORE	100	100		Claystone; lt. gray N-2, med. lt. gray N-6 w/ occ. laminae, mod. brn. 5YR 4/4, 2-10% silt, well sorted, silt. to mod. calc. laminated-faint, nonpetroliferous, hard, hrz. parting planes at 1107.79 & 1108.53 - both occ. along v. thin 6-01' med. dk. gray N-6 silt lenses.	
1109.58-1110.92	39	5.5 CORE	100	100		Petroliferous Claystone "Oil shale", bluish red 5YR 3/6, 10-15% silt, mod. to well sorted, coarse, laminated - well dev. & regular, mod. to low petroleum content (low grade), hard, nonbrn.	
1110.92-1111.03	39	3.5 CORE	100	100		Silty Sandstone (Tuffaceous?), dk. gray N-5, v. fine gr. sand & coarse gr. silt, subrounded to rounded, poorly sorted, silt. calc. thinly bedded, nonpetroliferous, hard, nonbrn.	
1111.03-1114.84	39	3.5 CORE	100	100		Silty Claystone; brownish gray 5YR 4/1, med. gray N-5, lt. brn. 5YR 6/4, 10-15% silt, mod. to well sorted, calc. laminated - well dev., silt. petroliferous, hard, hrz. parting planes at	

NOTES:

FORM

FIELD LOG OF BORING

PROJECT NO. 74-06B

BORING NO. P-3

DATE 10/29/74 TITLE SUN-PHILLIPS-30N10

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L.W. FALLING 2500, 6 3/4"
DIAMOND BIT, ROTARY/DIR

LOGGED BY W.R. LUND

. 99 .

RQD

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					112.96 - smooth - clean face	
114.84 - 115.57	39	3.5" CORE	100	100	Petroliferous Claystone "O.1 Shale"; pale yellowish brn. 10R 4/2, mod. brn. 5YR 3/4, grayish red 10R 4/2, <10% silt, well sorted, normal, laminated - well dev., silt. to mod. petroliferous - low grade, hard, nonfine.	
115.57 - 117.93	39	3.5 CORE	94%	100	Silty Claystone; med. dk. gray N-9 to pale yellowish brn. 10YR 6/2, 15-20% silt, mod. sorted, calc. → silt. calc. w/depth, laminated - well dev. to faint, nonpetroliferous to silt. petroliferous, hard, brz. parting planes at 116.61, 117.60, 118.80, 119.0, 121.9 - faces clean & smooth.	
117.93 - 118.95	39	3.5 CORE	100	100	Petroliferous Claystone - "O.1 Shale" blk. sh. red 5R 7/2, 5-10% silt, well sorted, silt. calc., laminated - well dev., silt. to mod. petrolif- erous - low grade, hard, brz. parting planes at 118.95' - smooth - clean face.	
118.95 - 122.95	39	3.5 CORE	91.5%	100	Silty Claystone; med. dk. gray to brownish gray 5YR 4/1, 10-15% silt, mod. to well sorted, non- calc., laminated - indistinct, nonpetroliferous	

NOTES:

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FIELD LOG OF BORING

PROJECT NO. 74-06B

BORING NO. P-3

DATE 10/29/74 TITLE SUN-PHILLIPS - SONIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W, FRIELING 2500, 6 3/4" DIAMOND BIT
ROTOR/AIR

LOGGED BY W. R. LUND
• 100

RAD

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows of Force	Recovery, Condition			
						except for a thin quartzite stringer at 1124.90, irregularly surfaced parting planes at 1124.35, 1124.85, 1125.02, 1125.85	
1125.95-1127.27	39	3.5 CORE	100	100		Petroliferous Claystone - "Oil Shale" bluish red SR ⁴ / ₂ , 5-10% silt, well sorted, silt. calc., laminated, well dev., hard, confrag.	
1127.27-1129.42	39	3.5 CORE	100	100		Silty Sandstone (Tuffaceous?), med. grey M-5, subang. to subrounded & fine qtz. sand & coarse qtz. silt, poorly sorted, confrag., non petroliferous, porous, hard, confrag.	
1129.42-1127.69	39	3.5 CORE	100	100		Petroliferous Claystone - "Oil Shale", bluish red SR ⁴ / ₂ , 10-15% silt, med. sorted, confrag., laminated - well dev., and petroliferous - low grade - med. grade, confrag.	
1127.69-1129.2	39	3.5 CORE	0% 100	100		Quartz Sandstone; lt. gray ^{M-6} to lt. brownish gray SR ⁴ / ₁ , fine to med. grained, subrounded to rounded poorly sorted qtz. sand in a silt matrix 70%, bedding indistinct, non petroliferous, hard, irreg. surfaced frags. at 1129.05 & 1129.2, rx. is silty friable & porous.	

NOTES:

7-23-73 L-C.3

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/29/70 TITLE SUN-PHILLIPS-50410

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W FALLING 2500, 2 3/8" DIAMOND
Bit, ROTARY/AIR

LOGGED BY W.R. LOHD

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R.O.D.

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows Force	Recovery, Condition		
1128.20 - 1134.39	35/140	3.0" CORE	91.5%	100	Silty Claystone - Clayey, silty clay; Lt. gray N-6 silt-clay ratio 40 60 - but rotates back of forth as to which is forty & which is sixty, per centage, silt to mod. calc, laminated to thickly bedded - indistinct, silty petrolikeness, hard, hrs. parting planes at 1128.61, 1129.35 131.36, 131.37, 131.55 - between 1133.40 & 1133.7 rock broken up	
1134.39 - 1137.59	40	3.5" CORE	100	100	Siltstone; med. gray N-5 w/ tuffaceous stringers in the first foot yellowish gray 5Y 7/2, rounded gtz, a v. fine mafic & matrix, poorly sorted, mod. calc., thinly bedded - to indistinct or massive w/ depth - upper foot contains several horizons that are more tuffaceous than the remainder of the rock, hard - difficult to split w/ chisel, non petrolikeness, non calc.	
1137.59 - 1140.81	40	3.5" CORE	99	100	Claystone - Silty Claystone; med. dk. gray N-4, olive gray 5Y 4/1, local thin tuffaceous laminae pinkish gray 5YR 8/1, 5-10% silt, well sorted, mod. calc. to calc, laminated - well d.	

NOTES:

7-23-73 L-01

FIELD LOG OF BORING

PROJECT NO. 7A-068

BORING NO. P-3

DATE 10/29/74 TITLE SUN-PHILLIPS-SAND

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L.W. FAIRING 2500, 6 3/4" DIAMOND BIT, ROTARY/AIR

LOGGED BY W. B. Lund
102

RQD

DEPTH	SAMPLES					DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition			
						to locally faint, nonpetroliferous to silty petroliferous, hard, hrz. parting planes at 1139.90, 1140.18, 1140.23, 1141.25, occ. laminae lighter colored - probably tuffaceous.	
1143.91-1145.61	40	3.5" CORE	0	100%		Silty Claystones & Tuffaceous Claystones; v. similar to the rock described directly above except the number of lt. colored tuffaceous laminae has increased drastically - apparently as a result this area has become a zone of weakness (note at RQD) & is split by 5 hrz. parting planes while the rock on both sides is notable for its lack of fractures or parting planes	
1145.61-1151.87	40	3.5" CORE	91.5%	100%		Claystone - "Borderline Oil Shale"; med dk. gray N-4, olive gray SV4L, & lt. brownish gray SVR4L, 5-10% silt, well sorted, v. silty, cat to calc, laminated - faint to well dev, silty, petroliferous - reflected in darker color of rock than that in 1137.59-1140.91 interval - if oil shale it is v. low grade.	

NOTES:

7-23-73

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/29/74 TITLE SUN-PHILLIPS-SOHIO

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED C-W PAILING 2500

LOGGED BY W.R. Lord

ROD

109

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows Force	Recovery, Condition		
					parting planes at 1149.62; 1149.25	
					1150.5, 1150.86, - clean; smooth	
1151.89 - 1152.09	40	CORE 3.5"	100	100	Bitumen Impregnated Sandy Siltstone; grayish blk ^{N-2} to blk N-1, fine to med grained, rounded ptz discernable remainder of constituents masked by bituminous material, poorly sorted, noncalc., indistinct bedding, porous, v. high bitumen - petroleum content - faces covered w/ blebs of a sticky tar like substance, silty, friable	
1152.09 - 1153.36	40	CORE 9.5"	100	100	Silty Claystone; med. gray N-5, w/ fresh faces speckled pale brn. silt, 10-15% silt, med. to well sorted, silty calc., laminated - faint silt. petaliferous, spots of bituminous material on fresh faces, hr3. parting planes at 1153.62	
1155.86 - 1159.79		CORE 3.5"	100	100	Claystone; olive gray 5Y4/1, <5% silt, v. well sorted, noncalc., bedding indistinct - possibly massive, nonpetaliferous to v. silty petaliferous - fresh faces v. smooth	

NOTES:

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FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P3

DATE 10/29/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary Failing 500

LOGGED BY M. Siembicka

104

R.O.D

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					no silt grains visible w/ a 14X hand lens	
					between 1158.05' & 1158.4 - laminated,	
					parting planes at 1158.4.	
1159.59 -	40	35 CLRE	100	100	Claystone - Silty Claystone; med. dk. gray	
1162.45	41				N-4 to 14. brownish gray 5YR 6/1, 5-10% silt,	
					well sorted, noncalc to silt. calc - alter-	
					nating laminar fiss, laminated - well dev.,	
					silt. petrolicious, hard, parting	
					planes at 1160.65 1161.68	
1162.45	41		70	100	Claystone medium light grey N6	
1167.8					and very pale orange 10YR 8/2	
					hard to very hard thinly bedded	
					to laminated, color banding	
					poorly sorted, very low silt	
					content, highly calcareous	
					badly fractured between	
					1163.7 → 1165.1 some	
					surfaces are even and regular	
					while others are rough and	
					irregular, also from 1167.1	

NOTES:

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FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/24/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED ~~M. Siembieda~~

LOGGED BY M. Siembieda

L-W Air Rotary Failing 2500

105

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
					To 1168.0, fractured zone	
					irregular surfaces, but generally vertical. Some pyrite	
					in claystone	
1167.80	41		50	100	claystone Olive grey 5Y 4/1	
1173.84					(very uniform color), hard to	
					very hard, very faint bedding	
					but generally appears massive	
					poorly sorted almost no silt	
					very slight calcareous to non	
					calcareous, inclusions of	
					pyrite, and black needle-like	
					crystals. From 1169 to 1172	
					fracture zone at least 4 joints	
					can be seen, they are vertical	
					smooth regular, 3 occur at	
					60° to each other the 4 th	
					is parallel to another	

NOTES:

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FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/29/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LW Air Rotary Failing 2500 LOGGED BY M. Siembieda

RQD

106

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1173.84	41		100	100	Interbedded claystone and marls tone: Very pale orange 10YR 8/2, to dark yellowish brown (10YR 4/2) and greenish grey (5G 6/1) hard (marls tone) to very hard (claystone) thinly bedded to laminated, poorly sorted (almost no silt) moderately to highly calcareous, some fine grained pyrite/mica in rock. Veining is very prevalent especially in marls tone, where a blue color has stained the country country rock. Claystone is very brittle and has a hacky fracture. Some distorted beds and minor offsets. Parting planes at 1178.98, 1180.24, 1180.34. At 1182.58 a tuffaceous sandstone, oil impregnated (oil thick).	

NOTES:

fueno

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/29/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LW Air Rotary Drilling 2500

LOGGED BY M. Siembieda

107

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1183.5			100	100	Claystone! Olive grey (5Y 4/1)	
1186.34					very hard, thinly bedded bedded	
					(faint), poorly sorted, (very	
					little silt) non calcareous	
					to very slightly calcareous	
					some veining veining of unknown	
					material, non-fractured, some	
					fine pyrite/mica, very homogeneous	
1186.34			100	100	Silty claystone, blackish red	SR ²
1190.26					hard, thinly bedded, some	
					color banding, silt comprises	
					30% ± 10%, moderate sorting	
					non-calcareous, streaky	
					low oil content, non-fractured	
					parting plane at 1186.78	
					1189.35, some fine grained	
					pyrite/mica. At 1187.75 a 1'	
					thick zone "tap sand", black	
					sticky, soft, friable, high	
					oil content	

NOTES:

THIRD

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/30/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary

LOGGED BY M. Siembieda

RQD

10.8

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1190.96	42		100	100	Silty claystone: Dark yellowish brown (10YR 4/2), dusky yellowish brown (10YR 3/2) hard, laminated (faint bedding) silt content 10-30%, moderate sorting, non-calcareous to very slightly calcareous. Parting plane at 1192.21, 1192.45, non-fractured	
1193.18	42		100	100	Claystone Pale yellowish brown (10YR 6/2) to Moderate yellowish brown 10YR 5/6, very hard laminated, poorly sorted slightly calcareous (dolomite?) silicious(?), non-fractured	
1196.70					At 1194.37 sandstone, black (N1) medium grained, highly porous quartz, mica, feldspar(?). Claystone is non-fractured and non-fossiliferous	

NOTES:

fuero

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/30/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED LW Air Rotary

LOGGED BY M. Siembieda

RQD

100

DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1196.70	41		100	100	Claystone: Olive grey SY ⁴ /1	
1204.23					very hard, laminated, very low	
					silt content, poorly sorted,	
					non-calcareous, silicious(?)	
					very homogeneous, parting	
					planes at 1198.13, 1198.58	
					1200.95, non-fractured	
1201.23	41		100	100	Marlstone: very Pale orange	
1206.34					10 YR 8/2 moderately hard	
					thin bedded to Massive,	
					very little silt, poorly sorted	
					very highly calcareous, non	
					fractured, parting planes at	
					1202.03, 1204.76	
					1205.70, 1205.75	
1206.34'					Claystone Olive black SY ² /1	
1212.78					hard to very hard, (faint	
					bedding) laminated, very	
					little silt, poorly sorted	
					(silicious?) non-calcareous	

NOTES:

frano

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/30/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W Air Rotary Failing 2500

LOGGED BY M. Siembieda

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DEPTH	SAMPLES				DESCRIPTION	REMARKS
	No.	Type	Blows or Force	Recovery, Condition		
1266.34	41				fine-grained mass pyrite	
1212.78					Parting plane at at 1209.25	
cont					non-fractured, very homogeneous	
1212.78			100	100	Tuff Sandstone mass dark	
1213.93					grey N3 hard, very porous	
					massive, fine to medium grained	
					moderately sorted, secondary	
					calcite crystals	
1212.93					Marls tone. Very pale orange	
1215.55					10 YR 8/2 moderately hard,	
					thin bedded, possible silt (may	
					be the flecks of marlstone	
					"peeling off", highly calcareous	
1215.55			100	100	Claystone: medium dark grey	
1219.16					(N4) hard to very hard,	
					laminated (faintly), non-	
					calcareous, very little silt	
					nearly sorted, (silicious)	
					Parting planes 1219.64	
					1218.24, 1218.83	

NOTES:

THURNO

FIELD LOG OF BORING

PROJECT NO. 74-068

BORING NO. P-3

DATE 10/30/74 TITLE _____

ELEVATION _____ DATUM _____

START _____ COMPLETE _____

WATER LEVEL _____ AFTER _____

EQUIPMENT USED L-W-Air Rotary Failing 2500

LOGGED BY M. Siembieda

RQD

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[illegible]

NOTES:

FUSION