# CORE DRILLING PROJECT PEYTON CREEK PHOSPHATE AREA ARKANSAS

FINAL REPORT - PHASE II

NORMAN F. WILLIAMS

January 15, 1965

#### MEMORANDUM

To:

Chief, Technical Projects Division Area Redevelopment Administration U. S. Department of Commerce

Washington 25, D. C.

Subject:

Supplemental Conclusions to the Final Report Phase II

Contract No. Cc-6098

It is our conclusion that the drilling and other testing accomplished under the program carried out in the subject contract with your agency was adequate to establish the limits of the phosphate deposit being investigated. Since we were given to understand that the total tonnage to be required for the Mississippi Chemical Company to justify construction of a phosphoric acid or elemental phosphorus plant would have to be about three times as great as that proven by our drilling; we further conclude that the reserves present in the subject deposit are not adequate to justify the further consideration of Mississippi Chemical Company for a plant of the size they projected in their original discussions.

The Peyton Creek Phosphate Mining Company is currently producing some rock from this deposit and fine grinding it so that it can be sold for application as raw rock phosphate for appropriate agricultural purposes. The potential for an operation of this type can not be accurately established at this time since certain market and transportation considerations have not been completely explored. It is possible that a small but continuing and profitable operation of this type can be supported by the market and raw material presently known to be available.

We have been informed that additional investigations have been started and further investigations are contemplated for the purpose of establishing whether or not this material can be beneficiated to the degree necessary to make the product useable as feed for fertilizer plants in the State. It is our understanding that this work is being sponsored by the Peyton Creek Phosphate Mining Company. If these tests

show that the material can be beneficiated to a satisfactory grade at a low enough price to make it competitive with material now being shipped in from Florida, there is a substantial market available in Arkansas and a larger operation could be supplied, over the period required for the amortization of investment, by the reserves proven by the drilling and testing carried on as a part of our project under the subject contract.

Capies of this report will be kept on file by the State for inspection by interested parties.

Norman F. Williams

FINAL REPORT - PHASE II

ARA CONTRACT - Cc-6098

CORE DRILLING PROJECT
PEYTON CREEK PHOSPHATE AREA
ARKANSAS

# FINAL REPORT - PHASE II CORE DRILLING PROJECT - PEYTON CREEK PHOSPHATE AREA

#### INTRODUCTION:

Core drilling of the phosphate rock deposits in the Peyton Creek area of Searcy and Van Buren Counties, Arkansas has been conducted in two phases under the A.R.A. assistance program. During the first phase, October 1963 to January 1964, a total of eight holes was drilled at the Marshall deposit in Searcy County and six holes at the Ferguson deposit in Van Buren County. The results of the Phase I drilling are included in a prior report dated February 1964.

SEARCY VAN-BUREN COUNTIES, ARKANSAS

On completion of the first phase it was decided that further testing of the Marshall deposit was unjustified, and that the Phase II drilling should be used to extend the known reserves in the Ferguson deposit. The contract for the Phase II core drilling was let on April 2, 1964 to the E. J. Longyear Company of Minneapolis, Minnesota.

Drilling was begun on May 1, 1964 and terminated on October 2, 1964 with the completion of nine core holes. This report summarizes the results of the Phase II drilling.

DRILLING OPERATIONS:

One Longyear core drill was utilized in the project on an eight-hour day, six-day work week basis.

The drilling contractor elected to use wire-line coring methods down to the ore zone and standard NX coring equipment for the ore interval. The result was that except for the upper few feet of hole that was drilled for setting surface casing, there was a continuous core sample for practically the full depth of each hole. Core recovery within

the ore zone itself was consistently well above the specified 85 percent in all drill holes.

#### SAMPLING AND ASSAYING:

In most of the drill holes the phosphate rock occurred as a single, fairly uniform layer. In holes 5-8, 10 and 11, however, the phosphate zone was made up of two ore more layers of varying grade. Each of these layers was sampled and analyzed individually and the results appear in the table of chemical analyses. In the sampling process the cores were split, one half being sent to the laboratory for chemical analysis, and the remaining half returned to its proper sequence in the core box for a permanent reference. In addition adequate footages of core were retained to provide information on floor and roof conditions. All these cores are currently in storage at the office of the Peyton Creek Phosphate Mining Company at Leslie, Arkansas. All chemical analyses of the cores were made in Arkansas Geological Commission laboratory at Little Rock. Pulps of all the samples have been retained in the event check analyses are desired. Only the P205 content of the core samples was run to permit the laboratory to keep up with the drilling. Assays of the core samples are shown both on the table of analyses and on the stratigraphic logs of the individual drill holes.

#### RADIOACTIVE LOGGING:

As in the Phase I drilling, gamma ray logs were run in as many of the holes as possible to make certain that no important phosphate beds were overlooked in the core examination. Arrangements were made with the Water Resources Branch of the U.S. Geological Survey to use their truck-mounted logging equipment on a rental basis.

FERGUSON DEPOSIT

CHEMICAL ANALYSES OF PHASE II CORE SAMPLES

Hole	Sample	DEPTH	INTERV	AL(Ft.)	PERCENT	COM	POSITE
No.	No.	<del>-</del>	To Int		P <sub>2</sub> 0 <sub>5</sub>		Percent P205
S-7	1	372.6	379.3	6.7	16.3		
<b>5</b> –8	1 2	387.8 390.3	390.3 396.5	2.5 6.2	11.0 28.8	91	23.7
S <b>-</b> 9	1	391.5	402.7	11.2	18.4		
S-10	1 4 2 3		414.2 415.3 424.3 438.2	2.2 1.1 9.0 4.5	22.1 3.4 20.5 1.1	12'	19.2
S-11	1 2	366.5 369.7	369.7 373.2	3.2 3.5	14.6) 18.3	7'	16.5
S-12	1	401.6	408.9	7.3	17.5		
S_13	1	454.3	455.3	1.0	21.2		
S-14	1	452.1	454.6	2.5	11.6		
S-15	1	3 <i>7</i> 8.2	383.1	4.9	12.4		

Of the nine holes drilled during Phase II an attempt was made to log all but Hole S-14 which did not have surface casing left in it. Of the remaining eight holes only four (Holes S-7, 8, 10 and 13) were logged in their entirety because of difficulties in re-entering the drill holes. Reproductions of the lower portions of the logs of these four holes appear in the Appendix.

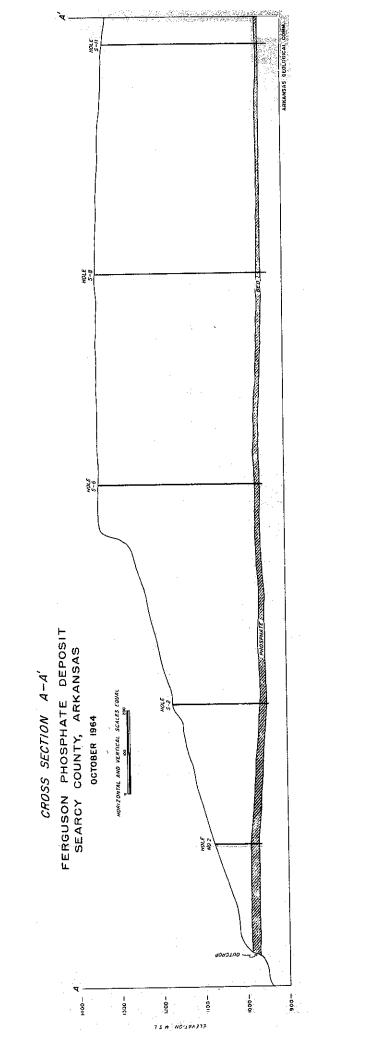
The gamma ray logs of these holes accurately verified the phosphate layers that had previously been visually logged in the core, and they also verified that no phosphate layers had been overlooked in the core examination.

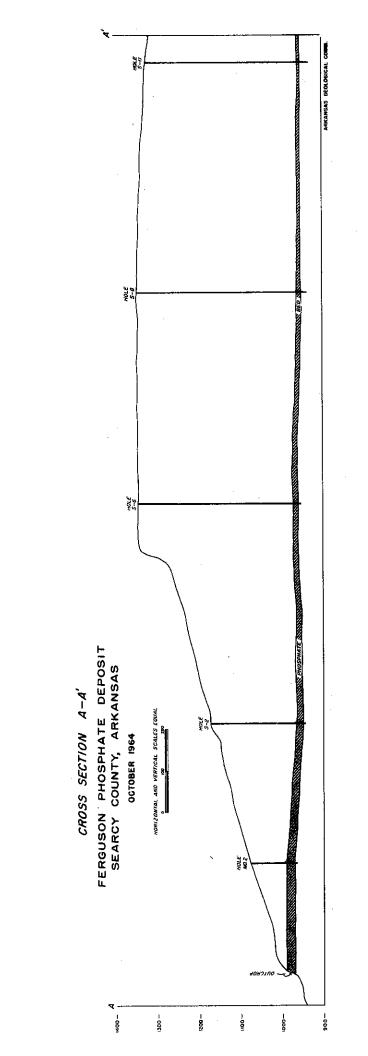
#### THE FERGUSON DEPOSIT:

Phase I drilling established that the phosphate rock trends southward from the outcrop, and the Phase II drilling determined the extent of this trend. The nine holes drilled during Phase II revealed that the deposit has a tongue-like shape and extends south—ward a distance of about 2700 feet from the outcrop. The shape of the orebody suggests that it may have been deposited in a bay or estuary.

The sequence of sandstone and shales overlying the phosphate rock as well as the sandstone bed enclosing it could be readily correlated in all the drill holes. From a study of the drill cores it appears that the phosphate was deposited along with the enclosing sandstone in topographic lows, i.e. basins and channels in the Pitkin land surface. The age of the phosphate rock is probably Mississippian, and it lies at or near the base of what the U. S. Geological Survey has designated as the Cane Hill formation in this area.

The phosphate rock cored in the Phase II drilling is essentially the same in composition and texture as that found in previous drilling and along the outcrop. It has the

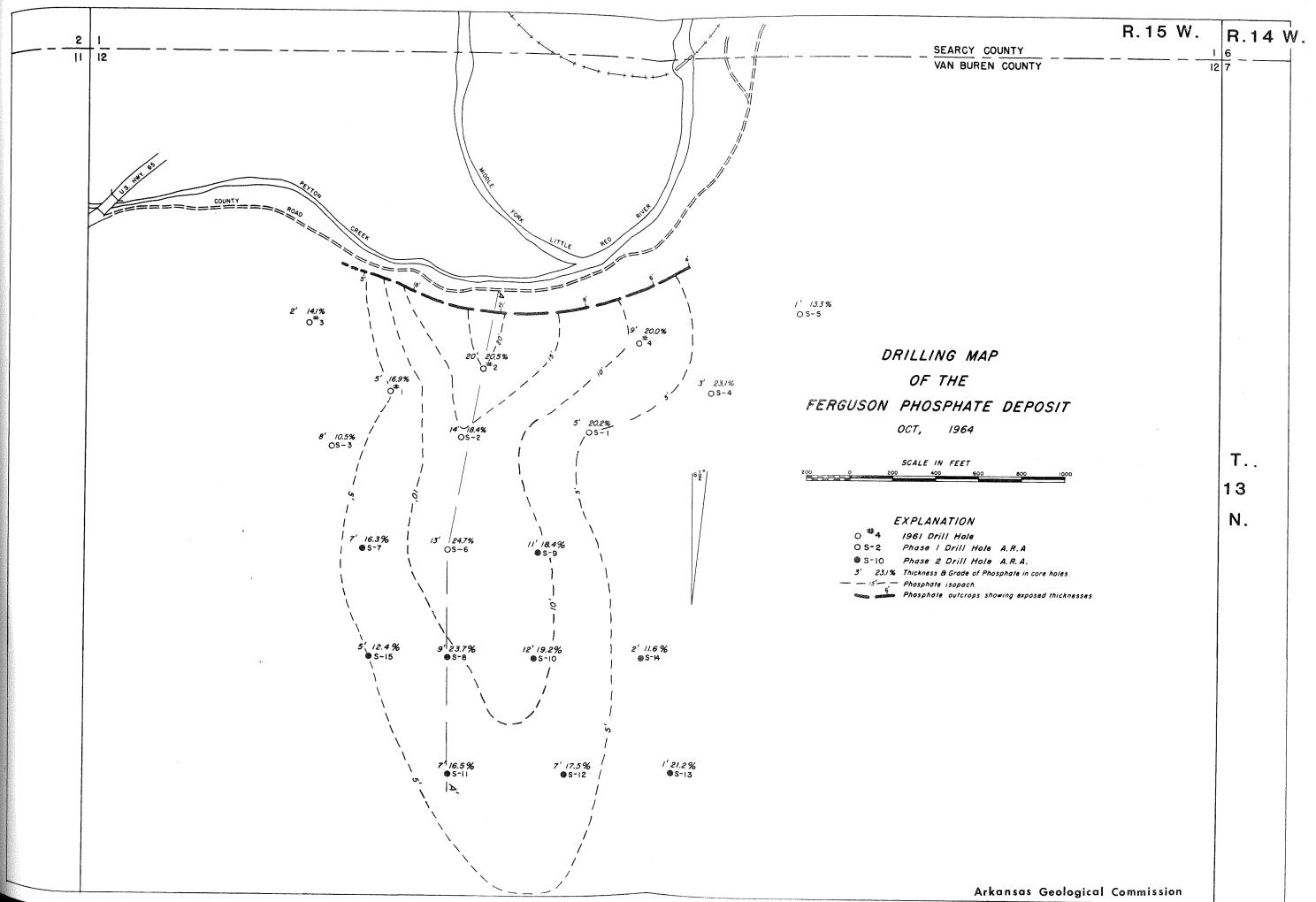




characteristic politic texture, calcite cement, carbonized wood fragments, pyrite, and varying amounts of quartz sand. The variations in grade are due primarily to the degree of dilution of the rock with sand grains.

#### ORE RESERVES - FERGUSON DEPOSIT:

Ore reserve estimates were made using the phosphate isopachs shown on the map and the average-end-area method of computation. A minimum thickness of five feet and an average grade of 19 percent P<sub>2</sub>0<sub>5</sub> was established for the estimate. A unit weight of 192 pounds/cu.ft. was computed for the phosphate rock by determining the specific gravity of the core from Hole S-6. Utilizing the above factors the Ferguson deposit contains 2,800,000 short tons of phosphate rock averaging 19 percent P<sub>2</sub>0<sub>5</sub> and occurring in a bed five feet or greater in thickness. It should be noted that this is a gross tonnage figure and makes no allowance for mining losses.

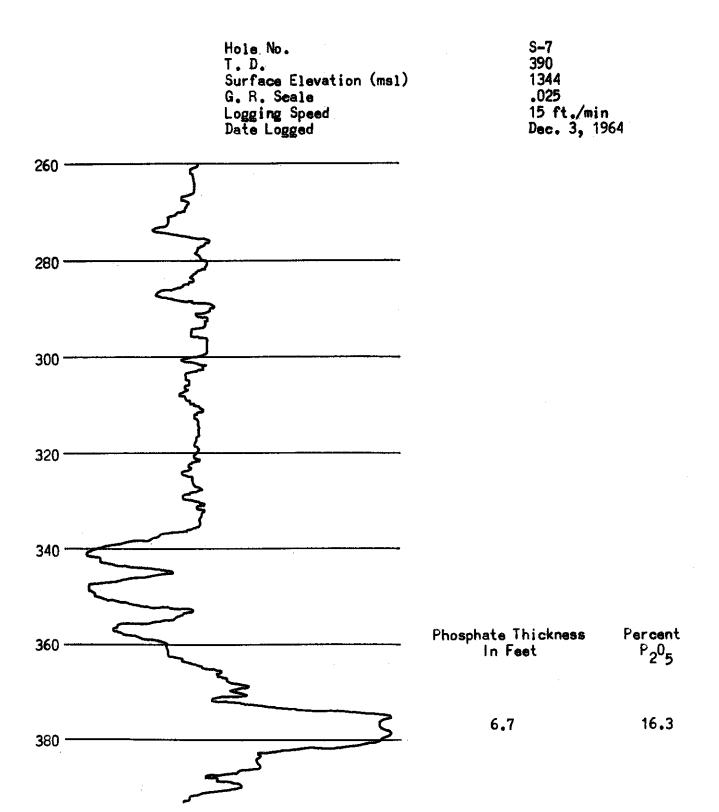


#### APPENDIX A

GAMMA RAY LOGS OF SELECTED DRILL HOLES

## A.R.A. Phosphate Drilling Prespect Searcy - Van Buren County, Arkansas

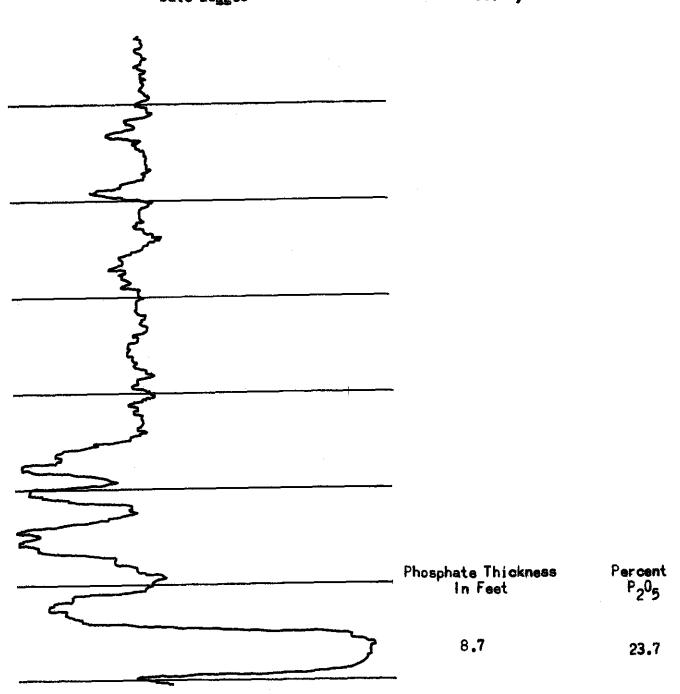
#### GAMMA RAY LOG



## A.R.A. Phosphate Drilling Prospect Searcy - Van Buren County, Arkansas

#### GAMMA RAY LOG

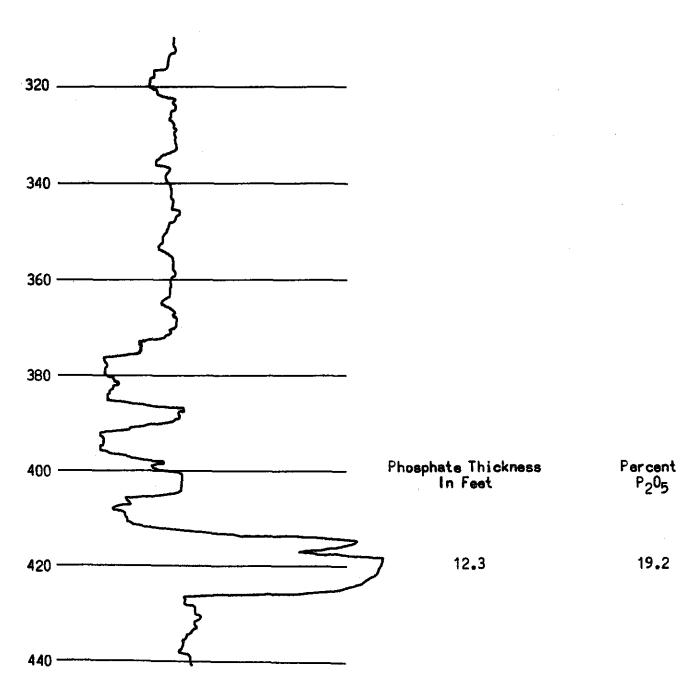
Hole No.	<b>S-</b> 8
T. D.	412
Surface Elevation (msl)	1347
G. R. Scale	.025
Logging Speed	15 ft./min
Date Logged	Dec. 3, 1964



## A.R.A. Phosphate Drilling Prospect Searcy - Van Buren County, Arkansas

#### GAMMA RAY LOG

Hole No.	S-10
T.D.	438.5
Surface Elevation (msl)	1377
G. R. Scale	.025
Logging Speed	15 ft./min
Date Logged	Dec. 3, 1964



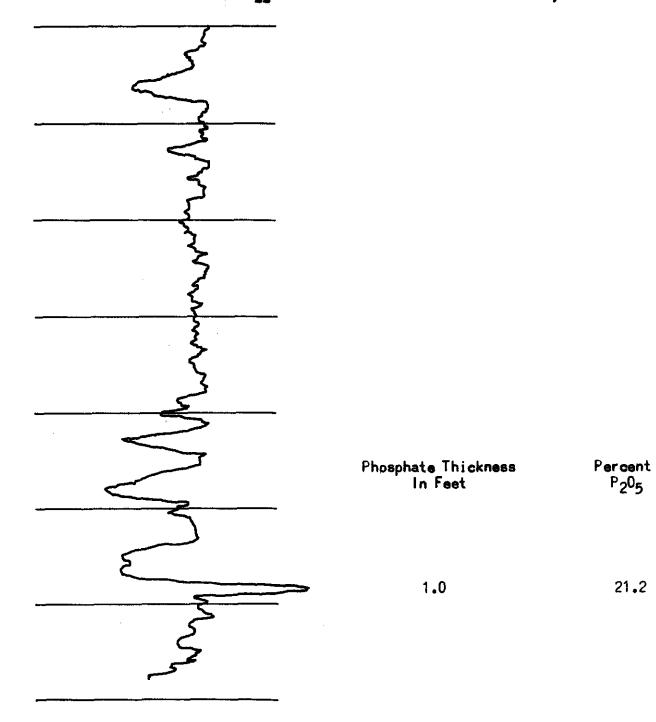
#### A.R.A. Phosphate Drilling Prospect

#### Searcy - Van Buren County, Arkansas

#### GAMMA RAY LOG

Hole No.	<b>S-13</b>
T.D.	473.3
Surface Elevation (msl)	1435
G. R. Scale	.025
Logging Speed	15 ft./min
Date Logged	Dec. 3, 1964

21.2



#### APPENDIX B

STRATIGRAPHIC LOGS OF CORE DRILL HOLES

### A.R.A. PHOSPHATE DRILLING PROJECT VAN BUREN COUNTY, ARKANSAS STRATIGRAPHIC 1

#### LOG

HOLE	NO	S <del>-7</del>	LOCATION.	SW 1/4. N	W 1/4	Sec. 12	Tlan.	R15W <b>, V</b> an	Buren,	Co.
PAGE 1	OF_	_2D	ATE\$/14/64	COLL	AR	ELEV	1344	NOTES	BYD.F.H	[

		LITHOLOGIC NOTES							
DEPTH	PROFILE	DESCRIPTION							
0-10'		soil and soft sandstone							
10'-5		sandstone; medium-grained,							
L	_	buff , massive, porous							
53'-7'	1	sandstone; medium-grained							
	L	gray slightly micaceous							
77 <b>'</b> -1'	<u> 3.</u>	5' shale; black, clay, scattered							
	L.	lenses of gray siltstone							
	L	(maximum thickness 1/2 inch)							
	<u> </u>	a few thin lenses of siderite							
173.5	-1								
		pebble conglomerate at base							
175'-2	27	' siltstone; gray micaceous							
2271-2	27	.5' shale; black, with interbedded							
	<u> </u>	siltstone							
227.5	<u>-2</u>	28' sandstone; gray, coarse-grained,							
		with shale and siderite stringers							
2281-2									
231'-2	31								
	<u> </u>	fossil debris and siderite							
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231.5	-2	34.4'shale; black, carbonaceous							
	<b> </b>	with siltstone partings, two							
<u> </u>		large siderite nodules at base.							
234,4,	-2	48' shale; black, carbonaceous							
		.7' debris zone; siderite and fossils							
248.7	<u>-2</u>	63.4'shale; black, carbonaceous 63.9'fossil debris zone							
263.9	<del>-2</del>	68.8'shale; black, carbonaceous							
		with siderite nodules.							
268.8	<del>-</del> 2	71.8'alternating layers of							
	<u> </u>	black shale and gray							
001 01		siltstone							
		74.6'siltstone; gray							
2/4.6	<del></del> 2	83.4'shale; carbonaceous with							
000 00	_	siderite lenses							
i e		84.8'shale; black							
		86.7'siltstone; gray							
		87.0'black clay shale							
287.0°	<del>  =2</del>	87.5'limestone conglomerate:							
	لــِـا	crinoidal, gray EMARKS: Lost water in fractured sandstone at 20							

BORING NOTES						
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REMARKS: Lost water in fractured sandstone at 207'

#### PHASE II A.R.A. PHOSPHATE DRILLING PROJECT

## VAN BUREN COUNTY, ARKANSAS STRATIGRAPHIC LOG

HOLE	NO <u>S-7_</u>	LOC	ATJON _	SW 1/4, NW 1	/ц Sec. 12 Т1	3N R15W, Va	in Buren, Co.,
PAGE	2OF	2DATE_	5/1 /64 5/14/64	COLLAR	ELEV. 134	4NOTES	BY D.E.H.

		LITHOLOGIC NOTES
DEPTH	PROFILE	DESCRIPTION
287.5	<u>-3</u>	85.2'clay shale; blue black
	<u> </u>	> same thin gray siltstone
	<u> </u>	partings, siderite nodules
	<u> </u>	and fossiliferous zones
335.2	<del>-</del> 3	7' siltstone; gray, wavy
	Щ	banding
337'-3	_	
3431-3	44	5' clayshale, black with
		siderite nodules and thin
		siltstone lenses.
344.5	-3	50.6'siltstone; gray, massive;
		siderite pebble conglomerate
		at base
350.6	-3	3.6'clay shale; black, with
		siderite lenses.
353,6	<b>-</b> 3	8.0'sandstone;-a few very thin
		shale partings
358.0	_3	63.6'alternating layers of
		gray siltstone and black
		carbonaceous silty shale
363.6	-3	67.1'black clay shale
367.1	-3	72.6'siltstone; gray, with colitic seams
372.6	-3	79.3'phosphorite; contains a few thin
		black shale partings and
0		sandstone seams
379.31	_3	84.0'siltstone; brown gray with
		thin shale partings
384.0	-3	84.9'interbedded gray siltstone and
		black shale
384.9	-3	87.2'black clay shale - a few
		siderite lenses
387.2	<b>-</b> 3	88' siltstone; gray
388.0	3	89.8'black clay shale
189.8	-3	90.0'calcareous shale; dense, hard,black
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### A.R.A. PHOSPHATE DRILLING PROJECT VAN BUREN COUNTY, ARKANSAS STRATIGRAPHIC LOG

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#### PHASE II A.R.A. PHOSPHATE DRILLING PROJECT

### VAN BUREN COUNTY, ARKANSAS STRATIGRAPHIC LOG

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PAGE_	2OF	= 2	DATE.	6/ 6/64	COL	LAR	ELEV.	1347	NOTES	BY_D.	F.H. ε	0.4

			LITHOLOGIC NOTES
DEPTH	PROFILE		DESCRIPTION
356.8	-3	0,4'	siltstone; gray, 3" siderite
			pebble conglomerate at 360
360.4	-3	34.8°	black clay shale; large
			siderite nodules, bottom
001			0.8' interbedded siltstone
364.8			sandstone; gray, massive
371.2	-3	75.0'	interbedded gray and black
			sandstone and black carbonaceous
	Ц		shale
375.0	-31	9.9'	black carbonaceous shale
			scattered siderite lenses.
379.9'			sandstone; dark gray massive
387.0			black clay shale
387.3	-3	37.81	siltstone; dark gray
387.8	-39	0.3'	siltstone; gray with phosphorite
	Щ		streaks.
390.3	_		phosphorite
396.5	-40	3.81	sandstone; brown-gray
	igsqcup		carbonaceous thin shale
403.8		<del></del>	partings at the bottom
403.8	-"1	<u></u>	black clay shale, few thin
111-4	19 19	61	gray siltstone partings black oolitic limestone
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### PHASE II A.R.A. PHOSPHATE DRILLING PROJECT

#### VAN BUREN COUNTY, ARKANSAS STRATIGRAPHIC LOG

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PAGE	1 OF 3 D	ATE 5/27/64	COLLAR	ELEV.	1359 NOT	ES BYDFH.OAW.PJS

			LITHOLOGIC NOTES							
DEPTH	PROFILE		DESCRIPTION							
0-15'			soil and soft sandstone							
15'-22	Ÿ		black shale with interbedded light gray							
			sandstone stringers							
221-73			sandstone: weathered, buff							
			medium grained well sorted							
			subangular to subrounded							
			massive - unweathered zone							
			8' thick at 68'							
73'-95	,		sandstone; light gray unweathered							
			fine to medium grained - stylolitic							
			partings filled with bituminous							
		<u> </u>	material - massive bedded							
95'-18	1'		black shale - numerous light							
			grav sandstone partings and blebs							
181'-2	04	1	black fissile shale - no sandstone							
			partings							
204'-2		17	sandy conglomerate							
204.3	<b>-</b> 2	04.7	siderite							
204.7	-2	05.21	sideritic sandstone; blebs							
			and streaks of light gray sandstone							
205.2	<b>-</b> 2	43 <b>.</b> 0'	sandstone: light gray, fine grained, with dark argillaceous							
			partings stylolitic in part. more .							
			argillaceous partings in bottom							
			4 feet. conglomeratic zone at 240'.							
243.0	-2	84.01	shale; black, fissile, micaceous							
			no sandstone partings 6" fossil							
			debris at 248'. 2" dark gray dense fossiliferous limestone at							
	L									
:			262.0'. 3" fossil debris at 264.0'							
			scattered thin siderite pebbles at							
		<u> </u>	268'-270'. 3" of fossil limestone							
			debris, some pyrite at 278'. One							
	_	<u> </u>	foot of fossiliferous limestone							
			debris at 281'.							
2841-2	86		black shale as above with thin sand beds up to 2" thick							
286'-2	89	1	sandstone: light gray, fine							
			grained subangular to subrounded							
			with carbonized wood fragments							

BORING NOTES								
DEP	TH	ER V	CORE	%				
FROM	то	INTERV	RECOV	recov.				
0	9	9	Rock	Bit				
0	386	377	NX W	reli				
386	426	40	Stan	lard				
		Core						
No	te:							
Core'	Recov	ery						
From	D' to	T.D.						
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100%		·						
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SAN	IPLIN	IG	NOTES	20 <sub>5</sub>
DEF	DEPTH & SAMPLE			
FROM		Z	NUMBER	<u> </u>  -
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#### PHASE II

#### A.R.A. PHOSPMATE DRILLING PROJECT

VAN BURET COUNTY, APPLAISAS LOG

HOLE	NO.	S <b>-</b> 9	(	LOCATION_			<del> </del>		<del></del>	
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		LITHOLOGIC NOTES
<b>DEPTH</b>	PROFILE	DESCRIPTION
		shale; black fissile
297-2	8'	sandstone and shale as above
		interbedded
298'-		sandstone; light gray fine-grained
299'-	304.5	
		fragmental, 2" fossiliferous
		detrital limestone at 299' and
		4" at 304-304.5',
304.5	-354.	7' shale; black, fissile,
		with fossiliferous detrital
		limestone zones, 4" at 319'
		3" at 344.5"; one foot
		of thin interbedded
		siltstone layers at 346.5'
		siderite nodules throughout
		the interval
354.7	<b>-3</b> 59'	siltstone; gray, finely banded
		with thin black shale partings
AFA		and lenses
359.0	-361.	
		nodules
361.9	<u>-362.</u>	9' siltstone; gray finely banded
362.9	-363.	2' black clay shale
363.2	-365 <b>.</b>	0' sandstone: gray massive
365.0	-366.	6' gray to black siltstone and
		silty shale with black
		shale partings, siderite
		fragment zone at 366.4'
366.6	-371 <b>'</b>	black clay shale with
		siderite nodules
371 <b>'</b> -3	76'	gray siltstone
376'-3		alternating beds of gray
		siltstone black siltstone
		silty shale and black shale
3 <b>79'-</b> 3	84-61	black clay shale with
		siderite nodules - sore
		gray and black siltstone
<u> </u>		seams

BORING NOTES								
DEP	тн	INTERV	CORE	%				
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#### A.R.A. PHOSPHATE DRILLING PROJECT

#### VAN BUREN COUNTY ARKANSAS STRATIGRAPHIC ARKANSAS

HOLE	NO.	S-9	LOCA	TION	······································				
PAGE_	<u>3(</u>	)F3	DATE_		_COLLAR	ELEV	NOTES	BY	

			LITHOLOGIC NOTES
DEPTH	PROFILE		DESCRIPTION
384.6'			siltstone; massive gray
386.4			phosphorite
386,5	-3	91.5'	siltstone; dark gray
	Ļ		carbonaceous
381.5'	<b>-</b> 3	92.31	interbedded phosphorite
	Ļ	<del> </del>	and gray siltstone.
392.3			phosphorite; black
393.8'	4	02.7'	cross bedded conglomeratic locally contains thin barren
		<u> </u>	siltstone seams
402.7	-41	05.4'	siltstone; gray, carbonaceous
		<u> </u>	with thin shale layers, pyrite
			seams and carbonized
	L		plant fragments
405.4'	-4	3.0'	black clay shale
+13.0'	-4	4.71	black colitic sandy
·	_	ļ	shale
414.7	-4.	16.5'	limestone; black, fragmental
		2.01	fossiliferous
416.5'			black clay shale
416.8°	₩,	17.5	limestone conglomerate; coarse, fragmenta
			colitic, black, fossiliferous
.35 51	1.6		(base of Cane Hill)
417.5'	-4.	18.2	black fossiliferous limestone
.70.01			and black shale
418.2'	-4	11.7	limestone; gray green.
421.7 <b>'</b>		22 11	slightly oolitic fossiliferous alternating black shale
12.20			and dense fossiliferous limestone
422.41	-114	ь Бирі	
12247	-74	-7 . 0	limestone; dense, black
424.81	_4 <i>′</i>	61	fossiliferous colitic alternating limestone
			and shale
			The AMAZAN

BO	BORING NOTES							
DEP	DEPTH		CORE	%				
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#### A.R.A. PHOSPHATE DRILLING PROJECT VAN BUREN COUNTY, ARKANSAS

UOLE	NIO	S-10		100	ATION	NE	1/4,	SW	1/4,	Sec.	12	Tl3N,	R15W,	Van	Buren	Co
HULL	NO.			LOG	6/9//6	4					7 /	מיר מ			וייות א	
PAGE	1 (	)F	2 <b>D</b> /	ATE_	6/20/6	4	_COL	LA.	RE	LEV.		3/0.8	NOTE	S B	A DEU	

		<u> </u>	LITHOLOGIC NOTES
DEPTH	PROFILE		DESCRIPTION
2-101			clay, and weathered shale
10'-37	2		black clay shale: interbedded
	<u></u>		buff sandstone in bottom foot
<u> 37'-80</u>	*		sandstone; brown friable
<del>!:: : "</del>	Ĺ		punky
80'-10	9.2	<u> </u>	sandstone; coarse grained
			gray with brown weathered
		0.72	streaks in the upper 5 feet
109.2	-2.	.3.7'	black clay shale, top 5 feet
	<u> </u>	1. 3.6	has sandstone interbedded
213.7' 214.1'	-2]	4.L'	sandy conglomerate
214°T	-2.	8.3	conglomeratic zone with
	<u> </u>		interbedded black shale and
218.3	7.	O IIV	gray sandstone sandstone; gray, fine-grained
KT0*3		9,4	numerous thin shale partings
500 v.t	<u> </u>		
259,4	-3.	12.9	black clay shale thin gray
	<del>  _</del>	·	sandstone layers in top 5 feet
312.9°			gray siltstone black clay shale
316.4			siltstone; gray, finely banded
	1		
317-4"	<u></u> =37	(T°A,	black shale-coarse grained
227 111	1 3.	77 01	fossiliferous and conglomeratic
321.4'	-3	1.0.	black clay shale with siderite nodules, narrow fossil trash
<u> </u>	┝		zones scattered thin gray
	├		siltstone layers
371.0	2'	7 <u>ш.</u> ц!	siltstone; gray, finely banded
<u> </u>		7.9.7	with some black shale partings
374.4	-31	85.5'	sandstone; gray, massive
	<del>                                     </del>		with stylolitic partings
385.5	3	89.31	black clay shale with
	<del>                                     </del>		large siderite nodules
389.3	-3	6.7'	siltstone; gray, massive to finely banded
	<u> </u>		
396.7	-3	99.51	alternating layers of gray
	<u> </u>		and black siltstone and black
	<del> </del>	ļ	clay shale
399.5	<del> -</del> 4!	Ψ3.3'	black clay shale with
			siderite nodules

8(	DRING	G N	OTES	3	
DEP	TH	INTERV	CORE	%	
FROM	TO	INI	RECOV	recov.	
0	9	9	Rock	Bit	
9	400	891	NX M	relin	e
40 <b>0</b>	440	40	Stand	ard I	X
		4	, A		
Note	Cor	e Rec	bvery		
from	91-4	0' v	es .	ļ,	
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DEF	TH	ERV.	SAMPLE	P205
FROM	TO	INT.	NUMBER	2 3
412.0	414.2	2.2	8-10-1	22.1
414.2			S-10-4	3.4
415.3	424.3	9,0	S-10-2	20.5.
433,7	138.2	4.5	S-10-3	1.4
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Analy	sis f	or t	ne	
inter	val 4	12.0	-424.3	]
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is 19	2% F	205		
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#### A.R.A. PHOSPHATE DRILLING PROJECT VAN BUREN COUNTY, ARKANSAS STRATIGRAPHIC LOG

HOLE	NOS-	10	LOCATIO	V				
PAGE_	2_OF_	2	DATE	COLLAR	ELEV	NOTES B	Y	

			LITHOLOGIC NOTES
DEPTH			DESCRIPTION
+03.31	-4	2'	sandstone; massive brownish
<u> </u>	-	ļ	gray
<del>112'-4</del>	14	2'	phosphorite with a few thin
1711 01	11.	10.01	barren sandstone seams
+14.2	_		sandstone-massive brown gray
+15.3'	-47	44.3	phosphorite - 3 thin black
124.3	31.7	6 01	shale partings
124.3	-44	10.0.	sandstone; gray with abundant thin shale partings
126.0	-43	3.71	black clay shale
		<u> </u>	
+33.7°	-4.	0.4	limestone; dark brown gray colitic with seams of
	-		asphaltic material and
			carbonized plant fragments
138.2	43	8.51	limestone conglomerate,
			coarse pebbles
438.5°	<u>.</u> 43	9.0'	limestone: black
	_	<u></u>	fossiliferous crinoid,
			fragments, colitic texture
		ļ	(Pitkin)
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BORING NOTES				
DEP	ТН	ERV.	CORE	%
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SAN	SAMPLING NOTES						
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HOLE	NO S-11	LOCATION_	NET SWE Sec 12	2 T13N	R15W	Van Buren	County	
PAGE_	1_OF_1	LOCATION _ _ DATE	COLLAR	ELEV.	1321.9	_NOTES	BYTUF,	DFH

	LITHOLOGIC NOTES
PROFILE	DESCRIPTION
0-10*	Weathered sandstone
10-42	Sandstone; reddish buff medium grained sub
	angular quartz sandstone limonite cement,
	traces of glauconite, compact, slightly
	mi Saceous
12-631	Sandstone; very light gray, fine to medium
	grained sub angular grains. Local red buff
	splotches near top. Local thin irregular
	partings of mica and shale. Compact.
63-164-5	Shale; dark gray with thin stringers of very 1
	gray fine grained sandstone; 104.5-1051 very
	sandy interval - very little sandstone in the
	lower 12° of this interval
5-213	Sandstone; very light gray fine grained,
213-342	abundant paper thin partings of slightly
	micaceous shale
3-342	Shale; dark gray with scattered stringers of
7 7 7	sand & fossils; 2217-2221 dark gray crinoidal
	limestone; 235.5'-236' fossiliferous limestone
	conglomerate; 263.0'-264.0' sandy; 274.0'-275.
	sandy; 275.5'-276' fossiliferous conglomeratic
	limestone; 328'-331', 336'-338' fine grained
	crossbedded quartz sandstone with stylelitic
	shale partings; 3381-338.71 crinoidal sandston
	conglomerate with large siderite pebbles
12-350.2	Sandstone; gray, massive
2-358.01	Clay shale; black, with large siderite nodules
0-358,71	Siltstone; gray with thin black shale partings
.7-366.51	Sandstone; dark gray fine grained with a few
	stylolitic partings
.5-369.7	Sandstone: gray with abundant politic seams
.7-373.21	
	0.2' conglomeratic, numerous shaly partings
	coated with pyrite and bituminous material
2-381.61	Sandstone; gray, fine grained massive, lower
	2 <sup>t</sup> has interbedded black clay shale
6-393.81	Black clay shale; thin gray sandstone partings
	in upper 4°
8-394 01	Limestone; black, fossiliferous, colitic
	coarse grained

BO	DRING		OTES	3
DEP	ТН		CORE	%
FROM	то	INTERV	RECOV.	recov.
0	10	10	Rock	Bit
10	354	344		ireli
354	394	40	Stan	dard
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Note:	cor	e re	pover	y fro
10" -	3941	was	6886	ntial
100%.				
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	774 70 369.7 373.2 Wei	70 20 3.2 3.5 Weighted	TH & SAMPLE NUMBER NUMBER 3.2 3.5 5-11-2

## PHASE II - A.R.A. PHOSPHATE DRILLING PROJECT VAN BUREN COUNTY, ARK.

HOLE	NO. S-12 1 OF 2 D	I OCATION_	NET SWE Sec	12 T13N R15W Va	n Buren County	
HOLL	110.	7-7-64		4 7504	2	er de
PAGE	1. OF 2 D	ATE 8-12-64	COLLAR	ELEV. 13/1.	<u>!_NOTES_BY_</u>	l UR

	<b></b>	LITHOLOGIC NOTES
DEPTH	PROFILE	DESCRIPTION
0-201		Weathered sandstone and shale
20-22		Very dark gray, crumbly
22-72°	•	Sandstone - pale yellow, medium grained compact
		trace of glauconite & mica
72-961		Sandstone - very light gray, fine to medium-
		grained compact trace glaucemite, trace of mical
		thin stylolitic partings of mica and black shall
96-102		Shale and sandstone; about 60% very dark gray
		"poker chip" shale interbedded with thin layers
		of very light gray sandstone
02-189		Shale; very dark gray "poker chip" shale, few
02-102		thin layers of very light gray fine grained
		sandstone
<b>89–19</b> 8		
07-176		Shale - very dark gray to black "poker chip"
100	20	shale
B-170.	9"	Conglomerate; up to 1" siderite pebbles in
2 25		enotebnas
8.3-25	J.,	Sandstone; very light gray fine to medium grain
<b></b>		compact, trace of glauconite, trace of mica.
EQ COL		Stylolitic partings of mice and black shale
50-275		Shale; like 102-189' at 250' and 258' conglowers
		siderite pebbles, abundant crinoids
75-296		Shale; very dark gray "poker chip", scattered
ļ	·	nodules and layers of siderite, several narrow
		fossil trash zones; very light gray sandy
		streaks in bottom 1º of interval
<del>96-29</del> 8	1	Sandstone; very light gray fine grained quartz
		sandstone, cross bedded with some shaly partings
	7	fossil zones in upper half of interval
98-306		Shale; very dark gray, scattered siderite nodule
6-307.		Sandstone; like 296-2981 interval
		Shale; very dark gray, abundant fossils scattere
		throughout - few siderite nodules - 3 crinoidal
		limestone at 308'
4.5-36		Shale; very dark gray, ecattered siderite nodule
		scattered fossils, 7" highly contorted light gra
		limestone at 327'; very fossiliferous at 341' an
		3511
3-366*		Sandstone; very fine to fine grained, very light
		gray, crossbedded. Some thin shale stringers

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DEP	тн	NTERV	CORE	%	
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396	424	28	Stan	dard	NX
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401.6	408.9	7.3	S-12-1	17
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OLF	•	NO S-12 LOCATION NET SWE Sec 12 T13N	R15W V	an Bur	en Co	unty	·	
AGE.	2	OF 2 DATE 8-72-64 COLLAR ELEV	/ 1371	.3 N	OTES	BY_	TUF	
			ı			<del></del>		
	1	LITHOLOGIC NOTES			RING		OTES	
IEDTLI	E	DESCRIPTION	ı	DEP	ТН	Ę	CORE RECOV	%
ÆPTH	8	DESCRIPTION		FROM	то	Ž	RECOV	recov.
		Shale; very dark gray						
2 <b>-36</b> 7	.2	Sandstone; medium grained very light gray,						-
2-372	Í		\$ .					
2-374	ŧ	Sandstone; very light gray, fine to medium						
<del></del>		grained, glauconitie, erossbedded, fossils in						
4-377	1	Shale; very dark gray, scattered siderite medu	100					
7-387		Sandstone; very light gray, fine to medium					· · · · · · ·	
	П	grained, crossbedded, very thin shale partings						
		and stringers common						
7-393	.5		•					
E 404		stringers near base		<u> </u>	<b></b>			
2-401	.0	Sandstone; gray, fine grained						
6-408	67	Phosphorite with interbedded gray sandstone and black shale streaks.			1		L	
9-412	1	Sandstone; gray, fine grained with shale						
		interbeds						
2-423	.5	Shale; black with streaks of fragmental						
		limestone			IPLIN		NOTE	
5-424		Limestone Conglomerate; black, coarse grained,			PTH	NTERV	SAM	
	-	fossiliferous		FROM	то	Z	NUM	BEK
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### PHASE II - A.R.A. PHOSPHATE DRILLING PROJECT VAN BUREN COUNTY, ARK.

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	·	LITHOLOGIC NOTES		DRIN		OTES		
		OF CONTRACT ! ON	DEP	TH		CORE		
DEPTH	1 S	DESCRIPTION	FROM	то	N N	RECOV.	recov.	
0-12	2	Weathered sandstons and soil	0	12		Rock		
12-23	3 5'	Sandstone; gray medium grained, stained brown	12	444	432	NX W Stan	ireli dard	ne
23.5-25	) KI	along joints  Sandatone; brown, porous, vuggy friable	777	70.0	30	W \$ 424.0	00.0	"
9.5-82		Black clay shale; siderite lenses, thin streaks	<del></del>				<del></del>	
		and partings of gray sandatone	Notes	core	rec	overv		
32.8-12	261	Sandstone; massive, brown medium grained	essen					}8
<del></del>		Sandstone; gray, medium grained, massive, some	to T.		7.0	7,5	JIII 1 E	1
140-1-	7.4	interbedded black shale in bottom 6'	(,,,,		<del> </del>	<b></b>		
2 25	10 61	Black clay shale; numerous paper thin gray	<u> </u>		<u> </u>	<del> </del> -		
70.3-22	4	sandstone partings, few scattered siderite	ļ	<b></b> -	<u> </u>	<del>                                     </del>	<del> </del>	
	++	lenses, gray sandstone 192.4-194.4*			<del>                                     </del>			1
B-25	20 20	Conglomerate	<b> </b>	<del> </del>	<del> </del>	<del> </del>	<del>                                     </del>	1
		Sandstone; fine grained, brownish gray, slightly	<del> </del>		<del>                                     </del>	<del></del>	<del> </del>	1
4.1-63	1		<u> </u>	<del> </del> -	<del> </del> -	<del> </del>	<del>                                     </del>	ł
				i				ł
5 20	J	micaceous, thin black shale partings	ļ	<u> </u>	J	L	<u></u>	
		Conglomerate	<b>.</b>	l	J	L	<u> </u>	
		Conglomerate Black clay shale: scattered siderite lenses:		1	l	1	.h.—	
		Conglomerate  Black clay shale: scattered siderite lenses:  fossil trash zones at 311.0-311.6'. 325.2-325.5'.	<b></b>	1	l	L	<b></b>	
0.2-34	19.6	Conglomerate Black clay shale: scattered siderite lenses: fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'	SAN	MDI I	N G	NOT	F S	
9.6-3	33.9	Conglomerate  Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstone; gray with breceis zone at 351'		MPLI		NOT		
9.6-3	33.9	Conglomerate  Black clay shale; scattered siderite lenses;  fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstone; gray with breceia zone at 351'  Black clay shale with some large siderite	DE	PTH		SAM	IDI F	<b>%</b>
9.6-35 3.9-36	19.6° 53.9°	Conglomerate  Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstene; gray with breceis zone at 351'  Black clay shale with some large siderite nodules	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	[2
9.6-35 3.9-36	19.6° 53.9°	Conglomerate  Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstone; gray with breceia zone at 351'  Black clay shale with some large siderite nodules  Sandstone; gray with some shale streaks and	DE	PTH TO	INTERV	SAM	IPLE IBER	% 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
9.6-35 3.9-36 363-36	33.9°	Conglomerate  Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstone; gray with breccia zone at 351'  Black clay shale with some large siderite nodules  Sandstone; gray with some shale streaks and siderite nodules	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	[2
9.6-35 3.9-36 363-36	33.9°	Conglomerate  Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstene; gray with breceis zone at 351'  Black clay shale with some large siderite nodules  Sandstene; gray with some shale streaks and siderite nodules  Black clay shale with few siderite nodules.	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	[2
9.6-35 3.9-36 363-36	33.9°	Conglomerate  Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstone; gray with breccia zone at 351'  Black clay shale with some large siderite nodules  Sandstone; gray with some shale streaks and siderite nodules  Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fessil trash	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	2
9.6-35 3.9-36 363-36	33.9°	Conglomerate  Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstone; gray with breccia zone at 351'  Black clay shale with some large siderite nodules  Sandstone; gray with some shale streaks and siderite nodules  Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fessil trash zone 377.9-378.5, several other narrower fees l	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	[2
9.6-35 3.9-36 4.5-41	19.6° 33.9° 58.5°	Conglomerate  Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstone; gray with breceis zone at 351' Black clay shale with some large siderite nodules  Sandstone; gray with some shale streaks and siderite nodules  Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fossil trash zone 377.9-378.5, several other narrower foss l trash zones	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	[2
9.6-35 3.9-36	19.6° 33.9° 58.5°	Conglomerate  Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstone; gray with breceis zone at 351'  Black clay shale with some large siderite nodules  Sandstone; gray with some shale streaks and siderite nodules  Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fossil trash zone 377.9-378.5, several other narrower foss l trash zones Interbedded gray and black sandstone and	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	[2
9.6-35 363-36 4.5-41	19.6° 33.9° 58.5° 14°	Conglomerate  Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstene; gray with breceis zone at 351'  Black clay shale with some large siderite nodules  Sandstene; gray with some shale streaks and siderite nodules  Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fessil trash zone 377.9-378.5, several other narrower fessil trash zones Interbedded gray and black sandstone and black shale	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	[2
9.6-35 9.6-35 3.9-36 4.5-41 417-41	19.6° 53.9° 54.5°	Conglomerate  Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstone; gray with breceis zone at 351'  Black clay shale with some large siderite nodules  Sandstone; gray with some shale streaks and siderite nodules  Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fossil trash zone 377.9-378.5, several other narrower fossil trash zones interbedded gray and black sandstone and black shale  Sandstone; gray	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	2
9.6-35 3.9-36 4.5-41 417-41 8.5-42	19.6° 13.9° 54.5° 14:	Conglomerate  Black clay shale; scattered siderite lenses; fosail trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstone; gray with breceis zone at 351'  Black clay shale with some large siderite nodules  Sandstone; gray with some shale streaks and siderite nodules  Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fessil trash zone 377.9-378.5, several other narrower fess l trash zones Interbedded gray and black sandstone and black shale  Sandstone; gray  Black clay shale	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	72
9.6-35 9.6-35 3.9-36 4.5-41 417-41 8.5-42 2.6-42	19.6° 53.9° 63° 54.5° 14° 18.5° 22.6° 25.8°	Conglomerate  Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstone; gray with breceia zone at 351' Black clay shale with some large siderite nodules  Sandstone; gray with some shale streaks and siderite nodules  Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fossil trash zone 377.9-378.5, several other narrower fossil trash zones Interbedded gray and black sandstone and black shale  Sandstone; gray Black clay shale Sandstone; gray Black clay shale Sandstone; gray	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	2
9.6-35 3.9-36 363-36 4.5-41 417-41 8.5-42 5.8-43	19.6° 53.9° 54.5° 14° 122.6° 22.6° 230.2°	Conglomerate  Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'  Sandstone; gray with breceia zone at 351' Black clay shale with some large siderite nodules  Sandstone; gray with some shale streaks and siderite nodules  Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fossil trash zone 377.9-378.5, several other narrower fossil trash zones Interbedded gray and black sandstone and black shale  Sandstone; gray Black clay shale  Sandstone; gray Black clay shale with siderite nodules	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	2
9.6-35 3.9-36 363-36 4.5-41 417-41 8.5-42 5.8-43	19.6° 53.9° 54.5° 14° 122.6° 22.6° 230.2°	Conglomerate  Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.61, 325.2-325.51, and 341.4-341.71  Sandstene; gray with breceia zone at 3511  Black clay shale with some large siderite nodules  Sandstene; gray with some shale streaks and siderite nodules  Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fessil trash zone 377.9-378.5, several other narrower fess Interbedded gray and black sandstone and black shale  Sandstone; gray Black clay shale Sandstone; gray Black clay shale with siderite nodules Sandstone; gray Black clay shale with siderite nodules Sandstone; gray massive lower 1.51 finely	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	72
9.6-35 3.9-36 363-36 4.5-41 417-41 8.5-42 2.6-42 5.8-43	53.9° 54.5° 54.5° 14° 122.6° 25.8°	Conglomerate Black clay shale; scattered siderite lenses; fosail trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7' Sandstene; gray with breceia zone at 351' Black clay shale with some large siderite nodules Sandstene; gray with some shale streaks and siderite nodules Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fosail trash zone 377.9-378.5, several other narrower fossil trash zones Interbedded gray and black sandstone and black shale Sandstone; gray Black clay shale Sandstone; gray Black clay shale with siderite nodules Sandstone; gray Black clay shale with siderite nodules Sandstone; gray massive lower 1.5' finely banded	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	1
9.6-35 9.6-35 3.9-36 363-36 4.5-41 417-41 8.5-42 5.8-43 0.2-43	53.9° 54.5° 54.5° 14° 122.6° 25.8°	Conglomerate Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7' Sandstone; gray with breceia zone at 351' Black clay shale with some large siderite nodules Sandstone; gray with some shale streaks and siderite nodules Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fessil trash zone 377.9-378.5, several other narrower fess l trash zones Interbedded gray and black sandstone and black shale Sandstone; gray Black clay shale Sandstone; gray Black clay shale with siderite nodules Sandstone; gray Black clay shale with siderite nodules Sandstone; gray massive lower 1.5' finely banded Interbedded black clay shale and gray and	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	1
9.6-35 3.9-36 363-36 4.5-41 417-41 8.5-42 2.6-42 5.8-43 436-43	19.6°  33.9°  54.5°  54.5°  18.5°  22.6°  25.8°  30.2°  38.8°	Conglomerate Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7' Sandstone; gray with breceia zone at 351' Black clay shale with some large siderite nodules Sandstone; gray with some shale streaks and siderite nodules Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fossil trash zone 377.9-378.5, several other narrower fossil trash zones Interbedded gray and black sandstone and black shale Sandstone; gray Black clay shale with siderite nodules Sandstone; gray Black clay shale with siderite nodules Sandstone; gray massive lower 1.5' finely banded Interbedded black clay shale and gray and black sandstone	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	
9.6-35 9.6-35 3.9-36 363-36 4.5-41 417-41 8.5-42 2.6-42 5.8-43 436-43	19.6°  33.9°  54.5°  54.5°  18.5°  22.6°  25.8°  30.2°  38.8°	Conglomerate Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7' Sandstone; gray with breceia zone at 351' Black clay shale with some large siderite nodules Sandstone; gray with some shale streaks and siderite nodules Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fessil trash zone 377.9-378.5, several other narrower fess l trash zones Interbedded gray and black sandstone and black shale Sandstone; gray Black clay shale Sandstone; gray Black clay shale with siderite nodules Sandstone; gray Black clay shale with siderite nodules Sandstone; gray massive lower 1.5' finely banded Interbedded black clay shale and gray and	DE FROM	PTH TO	INTERV	SAM	IPLE IBER	

HOL	Εľ	NO.	. S-13 LOCATION LOCATION					استان ای سروب	
PAGE	- 2	2	OF 2 DATECOLLAR ELEV	<i>/</i>	N	OTES	BY.		
			LITHOLOGIC NOTES		BO	DRING	N	OTES	}
	1				DEP	ТН	≥	CORE	%
DEPT	HÖ		DESCRIPTION		FROM	то	Ĭ.	CORE RECOV	recov.
445 2-4	444	3.8	Siltstone; brownish gray, massive				<del></del>		
			Phosphorite						
			Siltstone; gray, with thin shale partings						
		71	Black shale; numerous thin black and gray						
			siltstone seams interbedded				<del></del>	ļ.—	<u> </u>
			Black clay shale						-
47 <u>3.3-</u>	4741	_	Limestone; coarse-grained, black, fossilifere	us				ļ	<del> </del>
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## A.R.A. Phosphate Drilling Project Van Buren County, Arkansas STRATIGRAPHIC LOG

HOLE	NO. <u>S-14</u>	LOCATION NE L	/L, SW $1/L$ ,	Sec. 12,	T13N, R15W	<u></u>
PAGE	1 OF 2 D	ATE 9-21-62	.COLLAR	ELEV. 14	36.1_NOTES	BY D.F.H.

<del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>			LITHOLOGIC NOTES
DEPTH	PROFILE		DESCRIPTION
0-131			weathered sandstone
131-1	Б.,	1	sandstone; brown, buggy
	L		conglomeratic
16:31	-23	.51	sandstone; brown, limonite
-	<u> </u>	<u> </u>	stained, medium grained sandstone
23.51	27	.01	sandstone: gray, medium
	~		grained, massive
27.01	-80	1.31	black shale, numerous thin
			siderite lenses- thin
			gray sandstone lenses in
			bottom 71
80.31	1	0.01	sandstone: massive, brown
			limonite stained.
130.0	-]	48.51	sandstone; massive, gray
			unstained equivalent of
			preceeding interval
148.5	<u>  - ]</u>	54.51	alternating layers, of gray
<u> </u>	ļ_		sandstone and black shale
	<u> </u>	<u> </u>	(mostly sandstone)
154.5	<u> </u>	93.61	
<b>_</b>	<u> </u>	ļ	thin gray sandstone partings
<u> 193.6</u>	<u> -</u> ]	95.01	sandstone; gray, a few
<b></b>	-		interbedded black shale
	<u> </u>		layers
			black clay shale
~70.4		261.01	sandstone conglomerate;
261.0	1	262.21	siderite and sandstone pebbles black clay shale
	<del></del>	296.21	
20%.2	-	<u>670.4'</u>	sandstone; gray, fine-grained micaceous with numerous
<del></del>		<del>                                     </del>	closely spaced black shale
		1	partings
296.2	,	347.61	black clay shale; several
	<del>  '</del>		fossil trash zones, a few
			siderite lenses
347.6	, -	351.1'	siltstone: gray, with a few
			interbedded black shale layers
351.1		59.7	black clay shale
359.7	1-	360.7	gray siltstone

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HOLE	NO	ا 	S-14	LOCATIO	N			
PAGE	2	OF	2	DATE	COLLAR	ELEV	NOTES E	Y

		<u></u>	LITHOLOGIC NOTES
DEPTH			DESCRIPTION
360.71	-4	12.41	black clay shale; several
		<u> </u>	fossil trash zones, few scattered
	_		siderite lenses, crinoidal
			limestone 361.3'-361.6'
412.4	-4	15.71	siltstone; gray, shaly, some interbedded black
	٠.,	10 01	shale and gray siltstone sandstone; gray, vuggy
415.7	-4	1	
130 0	١,		conglomeratic
418.0	-4	22.4'	sandstone; dark gray carbonaceous, abundant
	$\vdash$		
100 /	١.,	261	bituminous grains gray siltstone
422.4 4261-	20	71	black shale with
4201-	<b>4~</b> 7	-4'	siderite nodules
429.4		26 71	sandstone; gray, lower
427.4		1,50 - 1	part finely banded
126 7	-	39.51	gray sandstone and
1.70.7		77.	siltstone with a few
	<b>-</b>		interbedded black shale
			layers
/ 39 5	1/	144.31	black clay shale with
4,,,,,			siderite lenses
444.3	1_	52.1	sandstone; brownish gray
			fine-grained
452.1	1_,	54.61	phosphorite
		59.51	siltstone; gray, with
			thin black shale and pyrite
			partings
459.5	1_	464	black clay shale
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SAMPLING NOTES									
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### PHASE II - A.R.A. PHOSPHATE DRILLING PROJECT VAN BUREN COUNTY, ARK.

HOLE	NO. S-15 1 OF 2 D	LOCATION_NE	S₩a Sec 12	T13N	R15W \	lan Buren	County
11066	. 4 0	9-22-64					
PAGE	1 OF 2 D	ATE 10-2-64	_COLLAR	ELEV.	1329.2	NOTES	BY DFH

		1.5.1	LITHOLOGIC NOTES
	DEPTH	PROFILE	DESCRIPTION
ı	0-101		Weathered sandstons
	10-52	51	Sandstone; brown weathered messive medium
			grained
52	.5-77	81	Sandstone: gray compact slightly micaceous
			medium grained
77	.8-179	.7	
	·		some 3/4" siderite lenses
	<u>.7-179</u>		· ·
79	.9-230	•2	
	0.000		wavy thin black shale partings
	,2-232	-+	
	.4-235		
35	<u>.3-273</u>		Black clay shale with several fossil trash
		_	zones
			Interbedded black clay shale and gray sandstor
1	.5-279	_	
3.5	.4-289		
	<b>.</b> 7-291	-	Interbedded gray sandstone and black shale
	04 325	49	(mostly sandstons)
4	<u>91-339</u>	•	
		-	291.5% several narrow fossil trash zones,
30	.1-340	5#	numerous siderite lenses Wavy gray siltstone
•	.5-346	<del></del>	
141	<u>-2-346</u>	<u>. Jr</u>	
A	.3-347	28	part has stylolitic shale partings  Black clay shale
			Gray sandatone
	.9-349		
49	.2-353	.9	Sandstone; gray with numerous black shale
į		+	partings
57	.9-356	9	
-4		9-	silty
56	.9-364	1	Sandstone; gray, compact, medium-grained,
Ì			bottom part finely banded
3	64-367	8	Alternating black shale and gray and black
7			siltatone
3	67-372	.8	Black clay shale
			Sandstone; brownish gray fine-grained compact
Ì			with bituminous partings
שריב	.7-378	3.2	Sandstone; gray with thin black shale partings

BO	ORING	3 N	OTES	 }
DEP	тн	NTERV.	CORE	%
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<b>Votes</b>	Cor	e rec	over	fi
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	<u> </u>	LITHOLOGIC NOTES						]	BORING NOTES					
	DEPTH	PILE			RIPTION				DEP	ТН	VTERV.	CORE RECOV	% RECOV	
			Sandstone;	with ool	itic seams	and streat	ks and			,	=	 		
	Ĺ		bituminous	partings	<b>.</b>									
383 20	.1-394	.9	Sandstone;	brownish	gray comp	<u>act</u>	<del></del>							
40(	.9-401	.0	Black clay Limestone;	black, d	ense, argi	llaceous		i						
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