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JIM
TRINDELL
DRILLING
LOGS

Southern State Utilities

 $951 + 41$

Rush core

Push core TO 6' 1' runs

9-10 Set up MUDTUB + RIG

Mud Pump Not Functioning		
Tear Down + clean		

~~9-11~~

max	mod
-----	-----

6.7'

6.7' Rotary w/ clay BAR.
9/11 STATIC 2 in.

7-10

7-10	Rot. Rock BAR. Good Res
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very HARD	Slow Coring	Lost Bit
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Revised 7 7/8 To 8.5"

Set 9' 6" casing

Ream to 10' w/ 3 7/8	Plot hole
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Be Room - Softened up Lost 10-11

11-13

11-13	switch row/c	Set w/ cavities	No Rec.
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13-16 wire in 2 punch shoe w/dar 15ⁿ HARD
Soft w/ hard spots, ROCK
RUG

16-21	clay BAR.	Very HRP. knots $\approx$ 1' Rel. in soft clay/clay MATRIX
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END

9-12	STATIC	3'3"	TOP OF	6" CHAIR
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Clay B. 3.0 Ground

21-21	Rot. + Pushed	washed Green frames Cable
	1 Rec.	

Pushed LAST 1'
Shells & Curry soft

24-27

BARR

24-27 Clay Rot. + push 1' Good
 Dashed w/Fl. 2' Rec
 HARD Green knots Shelly
 Limey

27-30.25 HARD Shelly Limey 60 Rec.

30.25-34.33 Soft limey 60 Rec.
 Ream up 37/8 w/slab (3 1/2" slab)
 TO 34"

Set 35' 4" w 1' stick up

34.66-35.7 " more consd. w/slab " "

END

START 9-13 STATIC 4.5' Tpe. (3.5)

35.7-38 Clay^{MP} Shelly Partially cons. 65 Rec.

38-41 " " " "

41-46 MP Rock more cons. white to Lt Brown " "

46-51 MP Rock Bit " " " 75%

51-56 " grayer slightly 60 Rec.

BARR.	BARR.				Rec
56-60	WIRE & FACE DIS.	many shell molds slightly darker			~50%
60-70	"	"	"	"	~70%
70-80	"	"	"	"	~50%
END					
9-14	STATIC	3'8"			
80-90	WIRE & FACE DIS.	Whitish Lt. Grey Limestone - 2' to Greyish Sandstone			
90-95	"	shelly SANDY carbonate mud			
95-100	"	cohesive Gray like sandy carb. mud			
	punch shoe w/ catcher	shelly less cohesive sandy w/ black specks			
100-107	"	~6" Sand To cohesive carb. mud sands			
107-114	"	"	some softer sections		
114-120	"	"	still cohesive but softer		~50%
120-121.5	"	hit " " Rock AT 121.5		GD Rec.	
121.5-126	"	~1' Rock to soft prob sand & clayey DRK GRN. BLK Dolomite?			

126-127		Washed OUT			
127-132	punch shoe w/ catcher	LIGHT unconsolidated rock to DARK dense clay type to sandier cons w/ phosphate pebbles to lighter sandy w/ shell + phosphate pebbles			~95%
132-135	Rock shoe	HARD shelly knots w/ carb. mud slightly consolidated to loose			~75%
135-137.5	short shell catcher shoe	Assorted HARD Fossil Rocks + phosphate?			HARD to maintain ONLY Poor Rec. HIGH PRESS. PLUGGED BIT?
137.5-140	cut off ext. punch shoe	Assort. color Rock to Brown crushed rock to Brown then Grey soft cohesive w/ rock + shell fragments			~50%
pull string to check bit					
END					
9-25	START	short CATCHER shoe	med to lg. quartz pebbles in limy sand stone		GOOD Rec. ~40-50% per
140-146	FACE DISCHARGE	"	SAME		
146-151	"	"	HARDER MATRIX some shell molds in FIRST HALF		GOOD Rec. 146-149 1/2
			~149.5-154 FINE sand No Rec.		Taking FLOW

154-160	1/2 shoe " w/lat	Fine sands DRAINED out of core case, Taking fluid Prob.	10 Rec. Small Rec. common
160-163	Mixed granular	Course pebbles in sand slightly dilat.	135 138
163-167	" solter	" Taking some Fl.	
167-172.7	2" ext.	Fine sand in sticky matrix	GD Rec.
172.7-174	"	" w/1 mid section of Fine sand	
174-177.5	"	SANDS in matrix more clayey	
177.5-180			
END 9-25 START			
180-184	ext. shoe w/ current	FINE SANDS	GD Rec.
184-186	"	" "	12
186-190	"	" "	50%
190-193	"	" "	GD Rec.
193-197	"	" slightly clay	" "

197-200	"	FINE SAND slightly clayey	GD Rec.
200-210	" T.D.	Fine Sand w/ some clay several small sections of mostly clay	=80%

Sunniland

W17737

0-1	BROWN Sandy ORGANIC	Good Rec.
1-2.5	" " " TO LIGHT SAND	" "
2.5-4	Gray TO TANSAND TO BROWN + LIGHT lime stone	" "
4-5.5	BROWNish HARD Broken POROUS	" "
5.5-8.5	" "	" " Rec.
8.5-10.5		No Rec.
10.5-12.5	Cobble Lime stone	POOR Rec.
12.5-15		
Box 1		
15-19	shelly LIGHT clay	2.5'
19-23	LIGHT clay w/ lime R. pebbles	2.5'
25-27	Limey clay	
Box 2 25'		

27-30 SOFT TO HARD Limestone GO Rec.
w/ shell molds

30-35 Broken Limestone 3'
Box 3

35-41 Limestone 5'

41-47 " " Poor Rec.

47-57 Limestone to Limy SAND 4'
END BOX 4
2 58

57-60.5 Limy SAND shell bits GO Rec.
3'

60.5-66 Grey to White Sand 5'

66-69 SAND 2'
62.5
END BOX 5

69-70.5 " shell bits GO Rec.
1.5'

70.5-71 " GO Rec.

71-72.5 NO Rec.

72.5-74 SAND GO Rec.

74-77 " = 1.3'

77-81 SAND N.R.

81-86 " 3'

86-91 " GO Rec.
2787.6
END BOX 6

91-96 SAND Fine + small pebbles GO Rec.
+ phosphatic pebbles

96-97.9 Fine SAND GO Rec.

(97.9) Greyish Fine phos. pebbles
END BOX 7

101-101.5 Fine white SAND = .3'

101.5-102.6 " GO Rec.

102.6-103.6 washed out N.R.

103.6-105	FINE SAND	GD. Rec.
107.5-109	Washed out	N.R.
109-114.5	FINE SAND	1.5'
114.5-116	"	N.R.
END BOX 8 = 115.8		
115-117	FINE SAND	GD. Rec.
117-121	" "	" "
121-128	" "	4'
END BOX 9 = 129.5		
128-133	" "	GD. Rec.
END BOX 10 = 129		
133-140	" " Same Quartz pebbles " "	" "
140-143	Lime stone pebbles	21'
143-148	SAND w/ shells + quartz pebbles	GD. Rec.
END BOX 11 = 150.5		
148-158	" " + various pebbles	" "

158-160		N.R.
160-161.5	FINE SAND + LARGE Pebs.	1"
161.5-162.5	FINE SAND	GD. Rec.
162.5-167		No Rec.
167-170	SAND	2-2'
170-173		N.R.
173-177	Cuttings (SAND + Pebs.)	N.R.
177-181	Cuttings (" ")	N.R.
Box		
181-185.5	"	N.R.
185.5-191	" " "	"
191-192	Sand w/ Quartz pebbles	
221	SAND	
225	SAND Stone Quartz pebbles	

225-232

Coarse
Quartz pebbles.

Limy MATRIX

232-236.7

FINE
Quartz Limy MATRIX

Box

241-246

FINE Graining
in Limy clay MATR

241-246

Almost completely
Shelly

247-260.2

Sand

Box

260.2-306.5

Sand some competent

LARGE Quartz pebbles

Box

306.5-317.6

ALTERNATING

Sand + Clay

Box

317.6-328.4

" " "

Box

328.4-339.5

" "

Box

continuing - 378-383

WATER - 385-430

continuing - 430-447



WATER ZONE

Bit 1 7/8"

20 Blank

628 to 40

20 screen

70

339.5 - 349.6

ALTERNATING
SAND + ClayBox

349.6 - 359.5

11

11

Box359.5 - ~~360.8~~HARD packed clay
lime

360.8 - 360.8

"

"

360.8 - 363

HARD PLUG

363 - 369

Fossiliferous lime R.
to Grey shell fragments
Sandy rock to
lighter shelly lime R.START
to use
more
mud

369 - 371.5

white lime w/shell

Box

371.5 - 375

Ground up lime

375 - 381

Fossiliferous lime R.
to Ground up lime R.Box

381 - 381

softer Ground up
lime R. to HARDER
Broken up dense lime R.Reduced
circulation

391 - 399

coarse + Hard lime R.

Break

399 - 401

white shell fossil
lime R.

401 - 405

white lime Rock

Box

405 - 414

shell molds in
white lime R.

414 - 418.5

" "

418.5 - 421

" "

421 - 427

" "

Box 421.5

427 - 434

same to Ground up
white lime R.

434 - 441

Box 435.1

441 - 445

Ground white lime R.
Some shell fragmentsBox

445 - 448

" " "
Non-porous HARDLY ANY
Fossils + shell

Stopped Drilling Reamed, Set 350' 4" PVC

~~448 - 448~~~~No Rec.~~Reamed 3 3/8 Back to
448

448 - 449

No Rec;

449 - 455

Shelly LR. To Fine
lime R.Takes All
mud Like Drain
Loss Circulation
Flow —
≈ 20 GPM/min.

2' Rec.

4.5' Rec

*

100% Rec.

Getting hard to get
to Bottom

4' Rec.

Carries From
about 200' RangeFlow
Cut off
Full
Returns

455-461
Box END 456.2

Five Line R.
to Fossiliferous

461-469.5
Box end 465.6

Fossiliferous Line R
to soft Grey Sandstone
w/ black grains

469.5-476
Box end 476

soft grey sandstone
w/ black grains to soft
white to greyish
Line R.

476-481

To
702.5

Kevin C.

702.5-711

Fossiliferous lime stone
to fairly hard denser L.R.

711-716.4

soft fossiliferous L.S. $\approx 85\%$
to HARD dense crystallized Rec

716.4-721

HARD Dense crystallized Rec. 1st
Rock 1 foot

Softer Bottom not Rec.

721-728

Med. HARD fossiliferous
L.S. To more dense ground L.S. $\approx 60\%$ Rec.

728-735
END BOX
731.5

Softer Ground
L.S.

" "

735-741
END BOX
740.5

fossiliferous L.S. to dense
hard L.S.

" "

741-751

HARD Dense white to
tan sandy porous to
soft sand stone to med. cemented
ground shells sand w/ some phosphate pebb.

$\approx 90\%$ Rec.

751-761
END BOX
 ≈ 751.4

sand stone to shelly
fossiliferous L.R. " well broken

$\approx 40\%$ Rec.

761-766

Fossiliferous L.R.

$\approx 60\%$

766-771

Denser more ground up L.R.
w/ some shell molds

$\approx 80\%$

771-776

" " "

$\approx 90\%$

776-781
END BOX
781.8

mostly very fossiliferous
w/ some ground up L.R.

$\approx 80\%$

781-789 soft Ground L.R. with $\approx 60\%$
 ≈ 6 in. HARD L.R.

788-795 Very Soft ground ^{v. Sandy} L.R. $\approx 25\%$

795-801 soft L.R. to harder $\approx 65\%$
cemented sand + shell fragments

801-808

NORTH NOBLES FARM Road			
	method	Composition	Rec.
0 - .66	pushed	BROWN soil	
.66 - 2	MD BARREL w/ Rock Bit	= 2" HARD white ORANGE + Grey CARB. Rock to Carb. mud w/ Rock bits + ORGANICS	
2 - 4	" "	white + ORANGE BROKEN Rock To Carb. MUD AT Bottom	= 75%
4 - 7	" "	chalky CARB. MUD white	= 66%
7 - 12	" "	DARKER - Greenish tint CARB. MUD w/ SAND + clay components to fine sand w/ some shell + Rock bits	= 50%
Box END 12.25			
12 - 15	MD BARREL w/ SAW Bit	CARB MUD w/ SAND	= 90%
15 - 20	CARB MUD w/ shell to clayey mud Back to Carb mud less sticky w/ LARGE shell fragments		= 100%
Box Ends 2 = 18.5			
20 - 25	LRG. shell to Greenish clay w/ many sm. shell frags.		= 75-80%
25 - 29	" "	" "	100%
3 - Box Ends = 27			
29 - 34	" "	LIGHTER sandy Carb. mud w/ Less clay	100%
4 - Box END 34			spread TO = 6'

NORTH NOBLES FARM Rd.			
	method	comp.	Rec.
34 - 38	MD BARREL w/ SAW Bit	CARB. MUD w/ shell	= 3.5 = 87.5%
38 - 42	" "	" "	100%
Box Ends 5 = 41.75			
42 - 46.5	" "	very sandy much less shell	= 90-95%
46.5 - 51	" "	" "	= 100%
Box Ends 5 = 48.5			
51 - 56	" "	" "	= 100%
Box END 7 = 56			
56 - 61	" "	TOP HALF - sand in greenish matrix Bottom HALF - grayish L.R. ground up in LIGHTLY cemented MATRIX w/ some Carb. mud w/ some LRG. shell	= 100%
61 - 65	" "	gray L.R. coarsely cement. w/ much shell + molds	= 55%
Box Ends 4 = 60.5			
65 - 69	" "	whiter to LIGHTER gray L.R. LIGHTLY cemented w/ much shell + molds	= 100%
69 - 73	" "	" "	= 90-100%
Box END 4 = 73			
	" "	finer grained bottom carb. mud MATRIX (slightly green)	

N. NOBLES Farm Rd.				
DEPTH	Tool	Composition	Rec.	
73-78	new saw bit LIGHTER L.R.	LIGHTLY cemented	= 95%	
		w/ much shell + molds porous		
	Bottom	finer w/ carb. mud matrix (slightly ground)?		
78-81	CARBIDE FACE DIS. wire line	HARDER LIGHT GRAY L.R. porous w/ shell + molds	POOR REC. = 6"	
81-84	" "	" " " " " "	POOR REC. = 8"	
10 BOX END = 81.6		Somewhat less cemented		
84-92	" "	" "		
		LIGHTLY cement L.R. much shell + molds	POOR REC. = 37%	
92-97	Diamond Bit w/ Rock Shoe	SLIGHTLY better cemented somewhat less porous slightly darker gray	= 77.5%	
97-101	" "	" "		
		Slightly softer less porous	= 37%	
10 BOX END 101		Sandier w/ some L.R. shell + molds		
101-106	" "	" "		
		whiter softer denser carb. Rock narrow diam.	= 30%	
106-111	" "	N/R? (Sandier - softer)? (dropped)?	N/R	
111-114	" "	" "		
		v. fine Sand carb. mud matrix w/ much fine phosphatic grains	= 83%	
	Punch shoe	LIGHTER to slightly greenish		
114-117	" "	" "		
		v. fine Sand v. light gray w/ carb. mud matrix	= 85%	
12 BOX END = 117				

N. Nobles Farm Rd.				
Depth	Comp.			Rec.
121-126	Diamond Bit w/ punch shoe " LIGHTER	gray-greenish to greener clayier w/ v. fine sand + phosphatic salts w/ some shell material		= 100%
126-134.25	"	Sandy clay to clay w/ sand streaks		= 92%
13 BOX END = 129.5		Green silty clay		
134.25-141	"	Greenish-silty clayey		= 87.5%
141 BOX END = 139				
141-151	"	Greenish clay to very silty clay		= 58%
151-156	"	Very silty slightly clayey		= 100%
15 BOX END = 154.5				
156-161	" "	" "		
161-168.5	" "	" "		= 100%
16 BOX END = 164.5		" "		
168.5-174.5	" "	" "	w/ shell	= 98%
17 BOX END 17				
174.5-181	" "	" "		= 97.5%
181-188	" "	Very silty w/ clay matrix w/ shell		100%
18 BOX END = 184.5				

N. NOBLES Rd.

[illegible]

St. HUGHS

W 17500

Depth	meth.	Rec.	Lith.	Circ. + % Rec.
0-2	Push tube		organics w/ dark (grey) sandy Soil w/ 1/2 to 3" L.R. cobbles	Full Rec.
2-4	" "	6" upper	" (same as above) remainder orange SAND	Full Rec.
4-6	" "	upper 8-10"	dark grey Soil with cobbles (poss. stuff) lower sec. (compressed by pushing) compact orange SAND	
6-6.33	Cored w/ MD Barrie Rock Bit		L.R. w compacted clayey soil	.33'
6.33-11	" "		very leached porous L.R.	low circ. to lost circ. SET, casing = 3.5' Rec.
Box END = 7.5				
11-16	" "	"	w/ Root sys.	No Circ.
16-12.1	" "		porous L.R. w/ Root sys. in upper 6"	50% Rec. 11/11
Box END = 20				
21-21.6	" "		Not well cons. L.R. cobbles to 1.5' Less cons. L.R. cobbles	40-45% Rec. No Circ.

Depth	meth.	FORMATION TYPE	Rec/circ.
26-32	WIRE line w/ pressure bit	very leached out L.R. Rec. 5' of pieces of hard but w/ very Lrg. Leached out zones	= 1' in from of pieces of very open L.R. formation. No Rec.
32-41	" "	L.R. w/ slight crystallization to coral w/ some Cryst.	= 3' Rec. No Rec.
41-48	END BOX = 43	" "	crystalline coral to porous L.R. = 5' - 70%
48-55	" "	porous L.R.	= 2' - 30% No Rec.
55-61	" "	hard very fine comp. L.R. very porous w/ rust color depts.	= 3.5' = 60% No Rec.
61-68	" "	very porous L.R.	= 6.5' No Circ.
Box END = 61.5			
68-75	" "	very leached L.R.	= 1.5' No Circ.
75-81	" "	cryst. coral to dense porous L.R.	= 5' No Circ.
81-88	" "	Dense less porous L.R. to dense porous L.R. w/ some staining in water.	= 95% Rec. No Circ.
Box END = 83.5			
88-95	" "	whys to courser less porous L.R. fairly dense but porous L.R. w/ some dark staining	= 6' Rec. 35% No Circ.
95-101	" "	very porous broken L.R.	= 2' Rec. 30% No Circ.
	T.D.		

Peacock PARK

Meth-

Rec./other

Box 1

0-4

Pushed

dark organics

to Sand w/ L.R. Cobles

2' full

8-4

"

w/ white sand
orange

1' 50%

4-6

"

Black organics

to sandy organics

2' 100%

6-11

"

Black organics to sandy

3' 50-60%

END Box 1

w/ organics

11-15

"

sand to lime mud
w/ small cobbles

15-18

"

SAND to sand w/ L.R.
Cobbles

18-23

"

N/R

23-23.5

"

N/R

23.5-24

"

L.R. mud w/ cobbles +
some sand

0.33'

24-25

"

N/R

25-30

CORED
w/ MD barrel

L.R. COBBLES

circulation
w/ 100' log

Rock Bit

* Probably w/ mostly
sand washed out

0.33'

Metli.

Sample type

Rel.

30-35	cored w/ wireline + Rick Bit + Shoe	consolidated L.R. w/ shell to crystallized coral	4' 80%
END BOX 3		30-33	circ. loss increased Total loss AT 33'
35-41	" "	Broken L.R. w/ sand + shell stone cuttings	was unusable to get data for rest of hole
41-44.5	Pushed		2' 80%
44.5-45.5		N/R	
45.5-51	cored w/wire line	L.R. + sand coral w/ sand + shell washed out	= .75' 80%
51-61	" "	coral + sand stone fragments to cons. coral + mostly sand - washed out	= 1' 10%
61-71	" "	HARD sand stone to hard L.R. fragments	= 1.75' 17%
71-76	" "	Broken L.R. to cons. L.R. w/ sand and shell components	= 2' 40%
76-81	" "	cons. shelly L.R. w/ molds	= 2' 40%
END BOX 4			
81-88	" "	L.R. w/ shell molds to cons. sand stone w/ phosphorus to cons. L.R. w/ sand	= 4' 70%
88-95	" "	cons. sandy L.R. w/ molds	= 2.5' 90%
95-101	" "	very sandy cons. L.R.	= 4.5' 70%

END BOX 9%

* Some returns were temporarily achieved
when coring to 50' with core lost AT 70'
Loss of circ. again occurred when cleared to bottom AT 70'

HIGH HOPE FARM TRANS Sect #6

Depth	Tech	Rec.
0-3.5	Pushed ORG. Topsoil to wht. MUD	1.6
3.5-7.5	" med. hard to sticky carbonate mud	100%
7.5-8.0	" " "	100%
8.0-13	M.D. Barrel w/ Rock Bit stopped at hard rock barrel refusal = 3" hard competent Rock reddish + light to Ding to quarter size rough cobbles was not well cemented in matrix	1.5'
13-18	" " LARGER HARD L.R. chunks from loosely cemented matrix (18-22) to larger pieces (2-6") w/ very little shell or fossils to very shelly 3" piece w/ fossil molds w/ some iron coloration	
18-23	" " cont. of same type of formation stopped at 20' 6" casing Reamed to 8" - grinded 4" to 23'	2'
23-30	wire line w/ Diamond Bit very comp. L.R. w/ some reddish full of iron + iron w/ much crystallization	Full 100% Rec.
30-36	" " HARD L.R. Cobbles & 1" 5" less comp. Soft center from pugging	50% 2 Rec.
36-40.66	" " 6" hard wt. cobbles to ~1' grey lime stone w/ shell molds to 31" Lt. L.R. w/ crystallized cavity	

40.66-47	" " HARD L.R. w/ shell molds Lt. w/ some reddish brown sections	100% Rec. started to take some fluid at 46'
47-50.5	" " HARD L.R. FIRST 3.0' vert. cavity in core w/ yellowish + brownish staining deposits - Bottom 2.5' More fissures Broken up when cored also stained in dissolution zones	Lost circ. At 47' would not return w/ heavy mud
50.5-56	" " cored w/o inner barrel in place Lt. L.R. somewhat softer	1'
56-60.5	" " HRD. L.R. w/ fissures	2'
60.5-67	Reamed to 60.5 w/ 3 7/8" Bit HAD circulation during reaming Lost circulation soon as I started coring into new bottom. Plug stopped returning 60.5 - 61. Held head in stand pipe. Lost sight down hole At 61-61.5'	2' NO CIRC.
67-70	acted hard at top softened and penetrated fast at 61.5-62.5 hardened then softened at 65-67 FINE white sand - ONE 1 1/2" plug Sandy lime rock a small amount of the sand was on top of the rock most all of that run and even missing part of 60.5-67 was probably sand	1 1/2" NO CIRC.
STARTED LIQUID E2 MUD on top of thin Bent. mud	mx some easy mud - change to an extended shoe w/ catcher	

70-70.25 extended = 3" plug
Shoe w/catcher Rock + shell NO CIRC.
Basket

70.25-72.75 short went over = 3' sluff
extended before bottom
Shoe w/ Retrieved = 10" core
Basket
OF / Top third - sand encased
2" 10" in the mud
core Middle 1/3 - sand w/mud + Rock
Bottom 1/3 - lime mud + Rock

72.75-74 HARD L.R. AND TO SOFTER
LESS competent + w/

74-76 HARD cobbles + shell (sluff)?
= 2' competent L.R.
w/ some dissolution cavities

76-81 HARDER soft between 77.5-80
Hard cobbles on top (sluff)?
w/shell

Re = 2.5' med hard fairly
competent L.R. w/shell
+ shell molds

81-90 = 2' very Broken up
hard L.R.

90-101 21' HARD Broken UP
T.D. L.R. + sand stone

Reamed to 101 w/ 3 7/8

Placed 2" well

Screened 95-100

COPY TO Tom S.
10-22

MOWRY CANAL

Depth	Meth.	Sample	Circ./Rec.
0-1	PUSH TUBE	ORGANICS + SANDY SOIL	Good/Circ.
1-2	" "	carb. mud w/ rough carb. rock through out	Full Rec. " / "
2-3	" "	" " "	" / "
3-5	" "	" " "	" / " 2' Rec.
5-6	" "	—————	" / No Rec.
6-7	" "	" " "	" / 1' Rec.
7-9	M.D. BARREL w/ SAW BIT shoe cyle	" " " some LARGER ROCK PARTS	" / "
9-12.5	" "	" " " L.R. w/ some CARB. MUD cobbles	" / "
12.5-15	" "	" " " to some more cons. L.R.	" / "
15-18	M.D. Rock Bit	Porous L.R.	Loosing some fluid " / "
18-22	" "	" " " MORE Broken up	" / 2' Rec.
22-26	" "	" " "	" / 1 1/2' Rec.

* MUD mixes very poorly in canal water thinner than usual and stratifies in tub. w/ circulation some improvement below 260'

Depth	Meth.	SAMPLE	Circ./Rec.
26-30	Wireline Face Wash	Porous L.R. w/ fine inbedded crystallization	Some circ. only small loss = 1.75'
30-35	" "	Mostly porous L.R. w/ some crystallization in cavities two sections of hard TAN Rock	Circ. still good w/ slightly more loss = 4.25'
35-41	" "	Less consolidated L.R. very porous deeper in run	Reduced Circ. = 2'
41-47	" "	Very porous only recovered 1.25' 1/2 - 2" cobbles	Lost Circ. = 1.25'
47-51	" "	Very porous recov. some larger sections than prev. Run	No. circ. = 1.5'
51-56	" "	Much better consolidation much less porosity	Circ. trying to return = 4'
56-60.5	" "	" " "	Some return = 4'
60.5-70.5	" "	med. hard shelly L.R. harder dense section cored slow then dropped fast last 3'	= 3.5'
70.5-75.5	" "	cobbles and shelly porous L.R. w/ some denser med. hard L.R.	Stagnant water no return = 2'
75.5-80.5	" "	FAIRLY hard fairly non porous L.R. w/ very leached out section	" = 4'
80-85	* Lobber comment	Poss. FRESH WATER LENS	

	Meth	Sample	Circ./Rec.
80.5-86	wire line w/ faced side Bit	cobbles on top (may be shell) small shell mold pores w/ some leaching + some softer section most of rec. sample well consolidated	Lost Circ. trying to Return = 3.5'
86-90.5	" "	Fairly dense L.R. Some very dense w/ light to dark tan color	= 2.25'
90.5-95.5	" "	some fairly hard - some fairly soft L.R. w/ some shell + molds	= 5'
95.5-100.5	" "	Fairly dense well consolidated L.R. w/ some shell + mold + some crystallization in one reach cavity to darker L.R. w/ more shell + mold w/ less consolidation	NO CIRG. = 5'

#2
HARDR = 75-20
HARD ER = 25-35
= 33' Lost Circ' for about 30 sec
= 35-50' Reduced Circ.
50' Return increased.
cut faster = 35-45-50'
slower cutting = 50-
softened up some what
= 59-61 then hardened
again
lost Circ' 65'
Soft Drilled faster = 65-70'

廿

[illegible]

Depth	METHOD	PROPERTY	Sample	REL./CIRC.
0-2.66	PUSH CORED	2' Black Soil to cobbly L.R.		Full Rec.
2.66-5	" "	limy clay		Full Rec.
5-7.5	" "	" "		2' poss. compressed
END BOX = 8'				
7.5-10'	" "	" " w/ some SAND + lots of shell		= 2'
10-12.5	" "	limy component w/ mostly SAND mostly darker to lighter (poss. contamination w/ upper soil)		= 2'
12.5-17.5	" "	mostly SAND darker to lighter (poss. cont. from cell)		Full Rec.
17.5-22	" "	VERY SANDY limy mud		Full Rec.
22-26.5	" "	" " " "		Full Rec.
26.5-30	" "	" " " "		Full Rec.
30-31.5	" "	" " " "		Full Rec.
31.5-34	" "	" " " "		Full Rec.
34-37.5	" "	NO Rec.		

HAD Reamed to 25'
AND set 4" PVC
CASING

Depth	METH.	Miller Property	Rec. Sample	Rec./arc.
37.5-40	Pushcored	mostly sand w/ some shell		= 2'
40-44	" "	mostly sand w/shell to more clay w/shell		~ Full Rec.
44-48	" "	more clay w/sand + some shell		= 3.5'
48-52	" "	more sand w/some clay + shell		~ 6-8"
52-56.5	" "	" " "		~ 6"
56.5-61	" "	lighter colored limy mud w/sand + larger pieces of shell		Full Rec.
61-66	" "	DARKER sandier w/ more shell some larger		Full Rec.
66-71	" "	DARKER sandy w/some clay w/some shell		~ 2'
71-74.25	" "	*Retrieved w/ Next (Run)		~ Full Rec.
74.25-79	" "	Light to grey L.R. limy mud to more rock + shell		~ Full Rec.
79-84	" "	GREY L.R. w/ lots of shell		~ 4'
84-88	" "	GREY L.R. w/ shell		~ Full Rec.

Depth	METH.	Miller Prop.	Rec. Sample	Rec./arc.
88-92	Push core	Very shelly Grey L.R.		~ Full Rec.
92-96	" "	" "		~ 3.5' = 87.5%
96-99.75	" "	" "		~ Full Rec.
99.75-104	" "	" "		~ Full Rec.
		w/some more competent sections		
104-107.5	" "	" "		~ Full Rec.
107.5-111.5	" "	" "		~ 3.5'
		w/more competent sections		
111.5-115.5	" "	limy composition w/ shell + sand Top 2' (stuff or washed out during pumping out of core barrel?) Less competent		
115.5-118.5	" "	Less competent Grey limy shelly - sandy		~ Full Rec.
118.5-120.5	" "	" "		" "
120.5-123.5	" "	v. shelly w/more competent sections of shelly grey L.R.		" "
123.5-128	" "	mostly comp. v. shelly grey L.R.		~ Full Rec.
128-129.5	" "	" "		~ Full Rec.
* 129.5-129.5	2nd	Refusal at 129.5 Refusal of penetration at 129.5'		

Depth	METH.	Rec. Sample	Rec./circ.
129.5-135	Take dis. Bit Wire line w/ Rock shoe	HARDER L.R. w/ shell mostly LIGHTER color Some GREY	~ 95% Rec. Circ. Some Loss
135-140.5	" "	comp. Shelly L.R. LIGHT Grey to darker grey to LIGHTER	~ 3.5' GD. Circ. Some loss
140.5-146.5	" "	HARD AT Start ~ 140.8 (Rec.) Softer to 146.5 (washed away - clayey sand?)	Rec. ~ 3' of comp. Rock GD. Circ. Some Loss
146.5-149.5	Wire line w/ extended shoe + Basket	Greyish + Greenish sand w/ clayey component w/ Phosphatic granules	~ 2.75' GD. Circ.
149.5-154.5	" "	" " " "	~ 4.4' GD. Circ.
154.5-160.5	" "	" " " "	~ Full Rec. GD. Circ.
160.5-167.5	" "	more clayey w/ shell w/ black phosphate	~ 6.25' Rec.
167.5-170.5	Wire line w/ FACE DIS. + Soft Rock shoe	more clay Less shell + SAND	~ Full Rec. Poss. some from last Run / GD. Circ.
170.5-173.5	" "	denser Clay - Greenish DARKER	~ Full Rec. GD. Circ.
173.5-180.5	" "	" " " "	~ Full Rec. GD. Circ.
180.5-187.5	" "	" " " "	~ 2' PLUGGED SHOE GD. Circ.
187.5-195	" "	" " " "	
TD		somewhat lighter	~ Full Rec. GD. Circ.

6-200

0-5 DRILLED Through Fill

5-7 M.D. Rock NO Recovery - Fill

7-9 " " = 1 1/2' Rock dense w/shell
+ molds

9-10 " " very slow drilling
wood plug

10-13 " " STARTED losing fluid
WATER DOWN hole
TO WATER TABLE - AFTER
RUN
Some Rock to soft
mud (LAND surface) ? color
2nd half of Run To Black

Temp. - SET 3" casing to 14' in returns

Pulled 3"

Reamed 7 7/8" TO 12'

Set 12' 6" steel CASING

x

13-14

Lime rock + shells Retrieved From
+ mollusk mold 3" pushed casing

14.-14.66

HARD Rock Bits in DARK
Soil

14.66-17

HARD Dense rock w/
entrained shell + molds

17-19

" " "
Top recov. broken into
Cobbles apparent
somewhat softer less cons.
porous zone in between

Return reduced
TO TRICKLE
= 18"
Total Loss
Down Hole
Cavity 318.5
AT 318.5

G-200

Depth	Meth.	Rec.	Sample desc.	
19-22	MD BARREL ROCK BIT		Rock + shell cemented NO clay to rock + shell in soft 2 1/2' lime + sand	
22-24	Pushed		Lots of shell fragments some larger sections w/shell molds in a sandy limy paste	= 1 1/2' Rec.
24-26.5	"		SAND + shell w/some lime mud component	= 3' Rec. Top 6" may be sluff or bott. of prev. run
26.5-29	"		Shell sand/lime mud comp. w/rock fragments	1/2-1 1/2' Rec. Top 1" Rock + shell fragments
29-30	"		Rock + shell fragments entrained in limy mud	= 1' + 1/2" Rec. Shell top sluff or washed plug from bott. run
30-34	"		mostly shell fragments in limy mud	= 3-3 1/2" Rec.
34-37	"		" " " w/some rock	FULL Rec. Bad sluffing Set HARD pack 3" lime last 10'
37-39.5	"		shell fragments in limy mud	FULL Rec.
39.5-44	"		" " "	= 3.5' Rec.
44-46.5	"		" " "	FULL Rec.
46.5-51.5	"		mostly sand w/increase in phosphatic comp.	= 4 1/2' Rec.

G-200

Depth	Meth.	Rec.	Sample Compos.	
51.5-54	Pushed		sand w/ shell + phosphat grains	= 2 1/2' Rec. sluffing
54-55			No Rec. washed out during cleaning	
55-60	"		SAND w/some shell fragments + phos. grains	= 4 1/2' Rec.
60-63	"		" " "	= 2 1/2' Rec. sluffing
63-68	"		(w/ some more cong. chunks)	= 1 1/2' Rec.
68-72	"		" " "	= 3 1/2' Rec.
72-76	"		(w/ Bott. = 3" dark clayey comp)	= Full Rec.
76-78	"		sand w/shell w/some what of a carbonate component Top = 2" of dark silty correlates to bott. of last run	= Full Rec. Heavy sluffing
78-81	"		sandy w/some shell grading to more congl. rock fragments (Barrel refusal AT 81' glom) color	= Full Rec.
81-81.5	"		Rocky w/shell + some quartz. Barrel refusal 81.5'	= Full Rec. drilled in 81' 3" casing
81.5-85	wire-line		gray lime stone w/rock shes w/entrained shell	= 1 1/2' Rec. Rock catches twisted + obstructed recovery (Fluid Return w/some loss)
85-91	" "		cemented grayish shell frags - quartz - phosphate grains less cemented toward Bottom of record Sample	= 2 1/2' Rec. some loss of return

Depth	Meth.	Rec.	Sample Compos.	Rec./Return
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Depth	Math.	Rec.	Sample	Comp	Rel./Circ.
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141-147	↑ E. Box 12	Wire line extended Shoe w/ Basket	Soft carb. w/ shell + sand	≈ 5' Rec.
147-154	" "	" "	" "	≈ 7' Rec.
154-161	↑ E. Box 13	" "	" "	≈ 6' Rec.
161-168	" "	" "	inner barrel shoe plug	≈ 7' Rec.
168-172	" "	" "	" "	≈ 2 1/2' Rec.
172-174.66	↑ E. Box 14	" "	" "	≈ 2' Rec.
174.66-181	" "	Color chng. to w/ SAND and small % clay	to greener	≈ 5' Rec.
181-188	↑ E. Box 15	" "	greenish to lighter color in Bottom 1.5' of run	≈ 6' Rec. increasing fluid loss
188-193	" "	" "	Somewhat darker sand w/ some slight clayey comp. (loss poss due to plugged shoe)	≈ 2' Rec.
193-197	" "	" "	Greenish sand - w/ fine phosphate grain	≈ 3' Rec.
197-201	" "	" "	increasing ly dark v. fine sand w/ increasing clay compon.	≈ 4' Rec.
201-206	↑ END Box 16	" "	" "	≈ 3' Rec. * increasing fluid loss

G - 200

Depth	Meth.	Rec. Sample Comp.	Rec./Rt.
206-211	" "	increasingly dark + clay + y	5' Rec. *
211-213.5	" "	clay w/ sand + v. fine phosphate grains.	full Rec. *
213.5-221	wire-line w/ soft Rock T.P. shoe	greenish clay composite w/ darker higher % clay in vertical streaks	6 1/2' Rec. *
18	Box	* increasing fluid loss prob. due to higher salinity affecting fluid viscosity and higher pumping pressure need to core increasing clay comp. - fluid most likely being lost in higher zones in formation	

DRILLER

J. TRINDELL

F.L.D.E.P. F.6.5

Screen 80-95

Depth	Meth	Rec. Sample Comp.	Rec/Circ.
0'-2'	MDBARR	HARD Softened up = 1.5' w/ Dark Returns	= 4' Cobble 60 Returns
2-5.5	Pushed	soft black soil to (grey) lime mud - refusal 2X at 5.5'	1-1.5'

- Drilled hole for Pan
- Set Pan
- Reamed to 5.5' - 5 1/8" bit
- Set 5' 4" Steel Casing
- CASING bridged pushed over to side pulled 4"
- Reamed to 7 7/8"
- Set 5.5' of 5" PVC
- trouble w/ Sealing and with rotation of casing w/ barrel

5.5-7.5	MD Rock	HARD greyish LR. with softer less dense rock in vert. cavities - to reddish chert type rock = 3" back to fairly dense shelly Rock. slow coring.	64 Rec. Ed Circ.
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7.5-11	" "	very HARD to & somewhat softer brownish Rk w/ shell	Reduced Ret. 10-5'
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Depth	Meth.	Rec Sample Comp	Rec/Circ.
11-14	MD Rock	fairly dense lighter colored L.R. to softer w/ harder darker section 2-13'	Total less circ. = 3' Rec.
14-15	" "	softer w/ shell	= 1' Rec.
15-15.25	Push	one chunk of hard rock - barrel refusal	
15.25-19.5	MD Rock	Fairly hard compact rock to soft at bottom of RW	= 2' Rec. Poor Circ.
19.5-22.5	wire line rock shoe	inner barrel shoe plugged w/ cobbles	= 33' cobbles PLUGGED shoe
22.5-22.75	WIRELINE Ext shoe	brown-sticky, shelly	= .25' PLUGGED shoe
22.75-27.5	wire line rock shoe soft rock catcher	grayish soft brownish shelly rock to shelly sticky clay line	= 1' PLUGGED shoe
27.5-34.5	" "	larger shells - some intact - washed out matrix to brownish grayish rock = 1" cobble to 1-2" plug of black circ. + gray shelly rock	= 1.5' Fair
34.5-37.5	R. shoe w/ soft R. catcher	HARD DARK cobbles to L.R. shells + fragments to softer tannish L.R.	= 1' Fair
37.5-40.5	" "	soft L.R. to soft or sticky w/ section of larger shell	= 2' Fair
40.5-42	ext. shoe w/ BASKET	Light + soft to brown + hard - plugged shoe	

Depth	Meth.	Rec. Sample Comp	Rec./Circ.
42-46	wire line R. shoe soft rock catcher	hrd. brown w/ shell to softer + lighter w/ more finely ground shell	= 1.75' Rec. Fair Circ. improving
46-49.5	" "	soft ground up w/c. to packer hard - plugged shoe	= 4" Rec.
49.5-53	R. shoe soft R. catcher	hrd. dense w/ shell to less dense and very shelly drk.	= 2" Rec.
53-57	R. shoe soft R. catcher	broken up w/ cobbles obstructed shoe	= .5' Rec.
57-60.5	Rock shoe	drk cobbles + shell circ. - soft at lower section of RW	= 2" Rec. Circ - Poor
60.5-65.5	short ext. shoe w/ basket	sand w/ shell fragments	= 1' Rec.
65.5-67.5	ext. shoe w/ basket	finer sand plugged shoe	4-6" Rec.
67.5-72.5	" "	fine sand w/ shell	= 2" Rec.
72.5-77.5	" "	sticky lime mud w/ shell frags + phosphates grains + v. fine sand	= 4' Rec.
77.5-80.5	" "	" "	= 2.5'
80.5-82.5	" "	" "	
82.5-84.5	semi-ext. shoe for face drilling Bit w/ soft Rk catcher	HRD. grayish Rk	HRD Rk off in front of shoe = 1 1/2' Rec.

Depth	Meth.	Rec.	Sample	Camp	Rec./Circ.
84.5-87.5	Rock shoe	Very hvy shell dck RK. Cabbles blackd shoe			= 6" Rel.
87.5-93	Semi-ext. Face dish shoe & soft rock catcher	dck. fairly dense w/ lots of shell & much softer, less competent			= 4' Rel.
93-97	RK. shoe	Broken Rock + shell			= 6" Rel.
97-100.5	Semi-ext. Face dish shoe w/ soft + RK. catcher	" " "			= 1' Rel.
100.5-106.5	Rock shoe	NO Rec.			N/Rel.
RUN Back To 106.5	short ext. w/ Bsk.	SAND Rock Fragments + shell			= 9" Rel.
106.5-110	Rock w/ soft Rock catcher	BROKEN Gray L.P. + shell			= .66' Rel.
110-110.5	Rock shoe	" " "			= .5' Rel. POOR CIRC.
110.5-114.5	1/2 ext. shoe 6" to End w/ Bskd (Trap) on Kelley	Sticky lime mud w/ shell			= 3.75' Rel.
114.5-120.5	1/2 ext. sl w/ Bsk.	Gray - broken very shelly			= 2' Rel.
120.5-122	" "	" " "			= 10-12" Rel.
122-122.5	Semi-ext. Face dish shoe	plugged shoe			= 2.33' Circ.
122.5-114.5		getting harder more competent w/ shell			

Depth	Meth.	Rec.	Sample	Camp	Rec./Circ.
127.5-133.5	1/2 ext. shoe w/ Bskd	Gray L.P. w/ shell + sand very shelly AT Bottom of Run			= 2' Rec.
133.5-140.5	Semi-ext. F. dish w/ soft RK. (APL) shoe	gray sand + shell w/ phosphatic grains comp. Rock AT Bottom of Run			CIRC. 100% proving = 2' Rec.
140.5-147.5	1/2 ext. shoe w/ Bskd	Gray shell & L.P. broken up from coring			= 3.75' Rec.
147.5-154.5	Semi-ext. F. dish shoe	" " "			= 1' Rel.
154.5-160.5	RK shoe soft RK. catcher	" " "			= 3' Rec.
160.5-167.5	R. shoe soft + Rock catcher	somewhat more competent			= 1.5' Rel.
167.5-173.5	" "	very shelly fairly comp. - increasing ly sand towards bottom			= 4.5' Rec.
173.5-180.5	" "	gray - very sandy + shelly increasingly sticky			GDCIRC = 6.5' Rec.
180.5-187.5	" "	v. shelly sand stone fairly comp. to soft sticky sand. increasing ly on top			= 5' Rec.
187.5-194.5	" "	greenish - somewhat comp. to greenish shelly sandy clay			V. Good Circ. = 4.5' Rel.
194.5-200.5	1/2 ext. shoe w/ Bskd	sticky sandy clay w/ some shell fragments			

I-75 57.7 (acted sandier slipped out of barrel during retrieval or washed during coring)

Wier Line 44-47 ext shoe No Barrel
Pract. No Rec 47-51.5 1/2 ext shoe " "

GD Rec. 51.5-55 ext shoe " "
slow coring

GD Rec. 55-61 1/2 ext shoe w/back

GD Rec. 61-70 " " "

=6.5' 70-79 " " "

=81-83 ft started to be harder

74-75 started some mud

loss + mud thinning

GD Rec. 79-84 Rk. shoe w/splines

FALH Rec. 84-91 Rk. shoe reg. catcher

mud loss decreasing

90's - low 100's

GD Rec. 108-115 very little loss

of fluid

115-121 " " "

Pool Rec. 121-128 Turned from salt broken rock

basal into darkish sand w/some shells which couldn't push the broken rock up barrel

prob. early in run

=3' Rec. 128-132 darkish sand w/some shell

GD Rec. 132-136 darker

136-141 shells

141-147 darker - harder

clay increasing

S. I-75 ALLEY MM 57.7

GD Rec. 147-152.5 DARK HARD CLAY soft Rk. shoe w/back

v. slow coring

GD Rec. 152.5-161 " " "

END 14 clay shore greenish

GD Rec. 161-167 " " "

END 15 coring slightly faster

=4' Rec. 167-174 coring slightly faster still 170-173

FORM. LOT SANDY w/some clay comp. 1/2 ext. shoe

GD Rec. 174-177

GD Rec. 177-181 less of a clay comp. " "

Box 16

GD Rec. 181-187.5 " more greenish " "

=6' Rec. 187.5-195 greenish w/ more clay comp. " "

Box 17

195-201 greenish + clayey

Box 18 greyest sandier = 5' Rec.

I 75 well

2" PVC Screened 75' - 125' + 6"
+ 2 1/2' stick up Point

1 BAG Bent. pellets 125.5 - 130

18 1/2 BAGS SAND 73 - 125.5

#6-20

1 BAG Bent. pellets 68 - 73

1 1/2 qts GROUT - 68 - 12

Bent.

to 5 BAGS
Portland

Portland 12 - surface

BAKERS GRADE

Behind Hancy 460
Prison

Push ~~CORED~~ to 40.75'-
- refusal -

WIRE Lined 40.75 - END?

splined abrasive soft Rock Core

40.75-65 catcher till 65'

65-66 short ext. shoe w/ BASKET

66-69 FACE discharge shoe w/ metal BASKET

69- splined abrasive soft Rk. catcher

Circ. fair to poor 4/1 bit

81-86 thickened up mud some improvement

86-91 Hit sandy clayey type zone

fluid loss seems to be lessening

91-96 splined abrasive soft Rk. catcher

96-101 FACE discharge Metal Bsk. catcher
circulation improving

101-102 ext shoe w/ BASKET

114-121 " " w/o BASKET mod. loss

121-128 " " " " inner tube stuck in Rk. during retrieval

128-134 " " w/ BASKET

147-153 " " w/o BASKET

153-TO " " w/ BASKET MOD. LOSS

increased to 171 + 189 TR

BAKERS GRADE

0-2 Push BROWNISH Sandy SO. Recovery
CORED Soil

2-4 " " TANNISH Sticky Sand " "

4-6 " " " " " "

6-8 " " TANNISH to whitish increasing carb mud " "

END BOX 1

8-11 " " white sand w/ some carb. mud 90% = 2.5'

11-13.5 " " " " " " CD REC.

13.5-18 " " white sand w/ some carb. Rk. = 3.5'

END BOX 2

18-21 " " " " " " GD. REC.

21-24 " " " " " " " "

24-28 " " " " " " " "

END BOX 3

28-30 " " " " " " " "

30-35 " " " " " " " "

END BOX 4

more carb. + some Shell

BAKERS GRADE

Depth	tech.	Rec. CORE TYPE	Rec.
35-40	Push Cored	carb. mud + sand	6D. Rec.
END BOX 5			
40-40.75	" "	" "	" "
		to harder carb. Rk. Hit refusal at push corer	" "
41-47	Wire Line Core Syst.	fairly competent greyish L.R. Porous	= 4.5'
47-54	" "	" "	= 5'
END BOX 6		some lighter colored sections	
54-61	" "	" "	= 2.5'
61-65	" "	" "	= 2'
		softened up at bottom Prob. reason for majority of loss	
65-66	" "	LARGE % sand some shell	= 1' Rec.
END BOX 7			
66-69	" "	mostly sand stone w/ some shell & L.R.	= 1' Rec.
69-74	" "	" "	= 4' Rec.
		increased hardness + shell + porosity	
74-78	" "	softer increased sand %	= 2.5'
78-81	" "	very sandy to increased shell %	= 2'
81-87	" "	very broken w/ shell + molds	= 1.5'
Box 8			

BAKERS GRADE

Depth	tech.	Rec. CORE TYPE	Rec.
87-91	WIRE LINE	fairly dense greyish w/ some shell fossils + molds very unmy	= 3'
91-96	" "	similar to sandier shellier + harder	1'
96-101	" "	small sandy + shelly plug = 1" Recovered	POOR Rec.
101-102	" "	sandy some shell greyish somewhat sticky	= .75' Rec.
102-107	" "	greyish greenish fairly sticky	6D. Rec.
END BOX 9			
107-114	" "	increasingly dark clayey w/ some sandy streaks	= 6.5' Rec.
114-121	" "	" "	6D. Rec.
END BOX 10			
121-128	" "	* inner barrel stuck had to wash it out w/ inner barrel in place	= 2.5'
128-134	" "	somewhat lighter in color + sandier	= 4.5'
END BOX 11			
134-141	" "	somewhat darker + stickier	= 5.5'
141-147	" "	somewhat lighter in color + sandier	= 5.5'
Box 12			
147-153	" "	" " observed = 6" drop out of barrel down Rod	= 5'

Bakers GRADE

Depth	tech.	Rec.	core	type	Rec.
-------	-------	------	------	------	------

153-161	WIRE LINE	very sticky -	SANDY	GD Rec.	
		greenish clay	w/ sandy shell		

161-171	" "	"	"	"	GD Rec.
---------	-----	---	---	---	---------

171-179	" "	very sandy fine to larger grains	same clay layer	" 6.5'	
	TD.				

Rock 49-79

47-81

Well 50-80

WIND MILL Rd

14 Boxes

151 TD

Circ./Rec.

Depth meth

Sample TYPE

0-2'

push

brownish sand

w/organics to greyish sand

GD Rec.

2-7'

push

fine sand

brownish to light

2' Rec.

2nd Run to 7'

4-7'

push

fine brownish sand

to yellowish TAN

2.5' Rec.



8'

push

fine light brown

SAND

GD Rec.

(end Box 1)

8-10'

"

fine light to brown

SAND

GD Rec.

10-14'

"

fine sand somewhat

darker brown

" "

14-16

"

fine sand - much

lighter colored

" "

(end Box 2)

16-19

" "

fine light greyish

SAND

2' Rec.

19-23.5

"

"

"

"

GD Rec.

23.5-25

"

"

"

"

1.25' Rec.

(end Box 3)

25-28

"

"

"

"

1.7' Rec.

28-33

"

"

"

"

4' Rec.

Depth	WIND	mill	Rec.	Depth	WIND	mill	Rec./Circ.
Meth	Sample	Type		Meth	Sample	Type	
33-36.5	push	Fine light SAND	= 2' Rec.	74-80	wireline Rock shoe	Very shelly - porous Very light gray sandy	= 4' Rec. Some loss but generally 3d circ.
END BOX 4 36.5				80-81	" "	increasingly sandy + soft	GD Rec.
36.5-38	"	"	.75	81-87	" "	very soft - gray sand highly phosphatic slightly sticky	= 2.5'
38-43	"	"	= 3.5'	87-89	ext. shoe	" "	GD Rec.
Washed out 43-43.8 cleaning				89-95	" "	" "	= 4.5' Rec.
43.3-47	"	Light to grayish phosphate sand to soft gray lime rock at bottom of run	GD Rec. = 3.5'	95-101	" "	" "	= 2' Rec.
END BOX 5 47				101-108	" "	increasing clay ext. shoe comp. espec. towards bottom of run	GD Rec.
47-48	"	soft gray lime rock	= .66'	108-114.5	" "	increasingly clayey dark greenish	GD Rec. GD Circ.
48-51	"	Gray lime Rk. broken from compaction. Some harder sections	GD Rec.	114.5-118.5	" "	HARD GREEN CLAY To softer sandier clay	" "
51-54	"	"	GD Rec.	118.5-121	" "	softer sandier w/ green clay	" "
END BOX 6 54				121-128	" "	" "	= 5-6' Some dropped ground-down Mole
54-56	"	"	"	128-131	" "	" "	= 2.66' Rec.
56-60	"	"	"	131	" "	" "	" "
Hit Refusal At 60'							
Remained Set 60' 4" steel							
Switched over to wire line							
60-61	wireline	Fractured but harder grey lime Rk. face dish.	GD Rec. but GD Circ.				
61-67	" "	Lighter color more competent sandier w/ shell - w/ 6 Hly Porous	= 3'				
END BOX 7 61.5							
67-74	" "	"	3.5' some loss but General GD Circ.				

Wind Mill Rd.
Depth Meth. Sample type Rec. Circ.

131-135 wire-line
Ext. shot Very sandy w/
green clay GD Rec.

135-141 " " " " " 5.5'

END Box 13
= 141.3

141-151 " " " " " 8.66' GD Circ.

END Box 14

151 TD.

PRIDE PRISON #1
Depth METH Sample Type Rec./circ.

0-2 Pushed DARK Sand GD Rec.
w/soft shoe

2-4 " " DARK SAND to LIGHT Sand (white) " "


4-7 " " white Sand -2' Rec.

8-10 " " greyish Sand G. Rec.
END BOX 1
9'

10-12 " " Greyish to Tanish Sand " "

12-17 " " lime mud w/some shell molds + sand GD Rec.
END BOX 2
17'

17-22 Pushed " " NO Rec.

22-24 Pushed Ground shell frags w/ some Sand ~1' Rec.
Rock shoe w/CATCHER

24-29 " " " " " " RP-2

29-32 " " *Picked up some Sample GD Rec.
from above 29' + ADDED

32-32.3 " " it to 24-29 Run lime mud ground shell LIME MUD ROCK + shell " "
hardenung sp
END BOX 3
32'

32.3-34 Pushed clay shoe " " " " " "

34-35 " " fairly tough lime rock (refusal) " "
F shell w/molds

35-41 WIRE LINE HARDENED UP SET ROCK CATCH. bottom of RUN 8" Rec.

41-48	wireline loss	Porous moldic lime Rk.	= 3.5' Rec.
END BOX - 45		color lightened up towards bottom	some fluid loss
48-56.3	" "	LIGHT colored lime Rk. porous moldic	- 3' Rec.
		turned to fine phosphatic sand towards bottom	some fluid loss
56.3-60	" "	fine sticky phosphatic sand	- 1.75' Rec.
			" "
60-64	" "	" "	GD Rec.
END BOX 5 - 62.3			" "
64-70	" "	" "	- 4.75'
			" "
70-76	" "	" "	GD Rec.
END BOX 6 - 73.5		some shell	" "
76-81	" "	" "	= 1' Rec.
		turning darker	" "
81-88	" "	SADY turning to greenish clay	= 6' Rec.
			fluid loss decreasing
88-95	" "	DARK Green tighter clay	GD Rec.
END BOX 7 - 89			
95-101	" "	DARK clay to mostly sandy	GD Rec.
Box - 8 END - 98.8			
101-111	" "	Fine sand (slightly greenish 20% from mud fluid infiltration)	= 9' Rec.
END BOX 9 110			Some fluid loss
111-121	" "	FINE SAND	= 9.5' Rec.
END BOX 10 - 121			" "

121-131	WPR LINE	FINE Sand (greenish from clay % - or fluid infiltration)	GD Rec.
END BOX 11 131			Some fluid loss
131-141	" "	FINE Sand some what higher clay percentage	GD Rec.
END BOX 12 141			" "
141-151	" "	" "	GD Rec.
	TD		

PRISON #2

Depth	METH	Sample Type	Rec./Circ.
0-2	Pushed	ORGANICS to LIGHTLY colored SAND	Good Rec.
2-4	" "	TANNISH slightly  ser SAND	" "
4-6	" "	TANNISH med Sand w/ some organics	" "
6-8	" "	" " " "	" "
END BOX 1			
8-10	" "	" " " "	" "
10-13	" "	" " " "	" "
13-16	" "	" " " "	" "
END BOX 2			
16-20	" "	SANDY Carbonate mud w/ shell and lime rock cobbles	~3' Rec.
20-23	" "	" " " " some what darker - turning orange at bottom shell + harder rock fragments	~2.5'
23-28	" "	" " " "	~4.5'
END BOX 3			
28-33	" "	turning less sticky less orange tint Lime rock cobbles	Almost solid First 1.5' prob. stuff
33-38	" "	Light colored - sticky w/ LARGE shell frags.	Good Rec ~5'
END BOX 4			
~34'		turning darker grayish to greenish	

Prison #2

Depth	Meth.	Sample type	Rec/GWC
38-43	push	sticky-clayey turning greener w/depth	~2.75'
43-48	" "	less clay - greenish v. fine sand	~2.5'
end Box 5 ~45.5'			
Stopped push coring - Reamed to 5 7/8" - Set 4" Casing to 41' - Set up to wire line - bad seal with casing tripped out added 5' joint to 4" Casing pushed down to 45' - Set back up for wire line			

48-56	Face discharge Bit wire line ext. shoe	greenish clay (large rock cobble prob.) Caused loss.	~3' Rec
56-61	" "	" "	~2.75' Rec

61-66	" "	greenish clay to grayish lime rock substrate hardened (compacted into ext. shoe) Prob. lost recovery after 64-64.5'	~3.25' Rec
END Box 6			

66-73	face disch. Soft Rock Shoe	porous - broken - moldic w/ shells grayish lime rock	~2' Rec Some fluid loss
73-81	" "	" "	~2' Rec

Some
fluid loss

Prison #2

81-91	Rock shoe	less porous more compact Rock - Prob. turned solid to sandy and did not rec. after some fluid loss	~2' Rec
END Box 7			
91-101	" "	Sandy not very sticky (mud too thin increased mud weight)	~2' Rec Some fluid loss
101-106	ext. shoe	v. fine grayish sand w/ small shell frags	~4' + Rec. Some fluid loss
Box 8 END ~110			
106-114	" "	" " " " very phosphatic	~1' + " "
114-121	" "	" " " " clay streaks	~6.5' decreasing fluid loss
END Box 9			
121-131	" "	SANDY w/ clay streaks	~8.5' very little fluid loss
131-141	" "	" " " "	~8.66' GOOD ETC.
END Box 10 ~132.5			
141-151	" "	" " " "	~8'
END Box 11 ~144			
151-161	" "	" " " " having trouble w/ mud pump getting air in line and mud flow stopping do it	~3'
161-165	1/2 ext. shoe	clayey sand	~4' Rec GD Rec
END Box 12 ~163			
165-173	short ext. shoe	increasingly clayey plugged shoe	~2' Rec.
173-181	Rock to shoe	clayey - prob dropped core on retrieval	

NOBLES HUNT Camp
 5' Cuttings to 153' BAGGED.



#2

NORTH NOBLES - South

~ 45' west of USGS Site

Drilled w/ 3 7/8 TRI Cone

0-5

Black
ORGANIC Soil
to Shell

5-10

Shell

10-15

Shell to Rock
hardened up at ~ 13'

15-20

Rock To softer
clayey at ~ 18.5'Stopped and Reamed
to 13' to Set 6" steel CASINGStarted drilling w/ 3 7/8"
TRI Cone + Reamer

20-25

Hardened up again
~ 21.5 - 22'

25-30

Shell
softened up Around 25'
Some clay - toward bottom

30-35

Clay

35-40

"

50

"

Some fine
sand higher phosphates

50-90

Clay - greenish
Rt soft Rock or
Sand about 90'

90-150

Lime stone

150-165

SAND - highly phosphatic

165-172

T.P. dark green clay

Screen

115-145

30' screen

2" CASING

12-94' BAGS
Portland

Grout 80' to surface

3 bags Sand - 3 BAGS bent. pellets

to 145'

Sand to 95'

Pellets to 85'

~~WIND COW GRADE~~
"MUSTANG GRADE"

Depth	Meth	Sample type	Rec/Circ.
0-2	Pushed	organics + Sand	
2-4		clayey Sand	
4-9		" " Increasing clay %	
9-10 (end box 1)		NO REC.	
10-15		clayey Sand	~4'
15-20 (end box 2)		" "	~5'
20-24		increasing Sand	
24-29 END BOX 3		clayey SAND	~4'
- Drilled 8" dia. to 7' Set 7' 6" steel casing beats plug at bottom			
29-34	" "	" "	~5'
34-38	" "	" "	~4'

38-43 " clayey Sand ~5

43-48 " mostly Sand ~5

48-51.5 " " " ~3

51.5-56.5 " " " ~5

Push cored to 56.5
Reamed out hole 5 7/8"
to 56.5-57 Set 4" steel
to 57 push to 58'
Set up to WIRE LINE
WIRE LINE

56.5-61 " sand

66-72 " "

72-73.5 " "

81-88 " "

88-95 " "

95-100'

Sand

100-106'

Lime Rk

106-114'

Lime R to Sandstone

114-121'

SAND stone to
Sand

121-131'

clayey SAND

END 129.5

131-141'

"

"

4'

141-151'

"

"

2'

151-161'

"

"

2'

161-171'

Clayey Sand



221

SANDIER

100-106 Switched to Soft Rk shoe
started losing fluid
Rock in Sample sandy
Line Rock to harder w/shell

106 - switched to Rk shoe

Line Rock w/shell

- 105 - 110

SANDSTONE in between
+ 117 - 120

SANDY green clay
After 120

Notes For L-1

ext. Punch shoe to 139.5

short Punch shoe to 145

Good Rec. somewhat
more compact formation sand stone
type w/shell made
started some water loss

145-153

switched to
Soft Rock unweaved shoe
GOOD REC. more consolidated
very porous + matrix
reduced circ.

153-161

Switched to Reg
Rock shoe

Softened up rec. about
4' of sticky sand
Circ. increasing

161-168

Switched back to
ext. shoe

Well #2
50' - ~~80'~~ - Screen
- 80 FOR L-1 #2

140-150

L1-L2
Well #1

L-1 CANAL (L1-L2)
(S. of Clewiston)



60.5 - 75.5 one plug

Set 6" steel
Casing at ~ 13'

L-1 L-2

0-2		brown Sandy soil w/ organic	GD Rec
2-4		to lighter sand	" "
4-6		SAND	" "
6-8		Sand	" "
8-9.5	pushed		
9.5-10.5	" "	No Rec.	
10.5-20.5	"	LARGE Rock frags to white pebbly matrix	~8.5'
20.5-31	" "	Rocky to shelly to sandier	~4.0'
31-38.5	10' "	" " "	~3.5'
38.5-43	"	coarse sand w/ shell frags	~4.5' Rec
43-48	"	SAND w/ shell frags to soft greyish L. rock	GD. Rec.
48-53	"	greyish crumbly L.S. w/ shell	GD. Rec.
53-58	pushed	greyish crumbly lime st.	" "

58-62		crumbly grey SL Cobbles	
62-66		greyish hard Cobbles in soft matrix	~4' 8"
66-66.5	pushed	Cobbles refusing	
66.5-75.5	wire-line	one hard knot of Rock	
75.5-80.5	"	SAND stone	
80.5-87.5	"	Very Sandy Semi comp.	
87.5-94.5	"	Semi comp Sandy stone to fairly comp.	
94.5-100.5	"	NO Rec.	
100.5-104.5	"	3-4" broken Rock	
104.5-111.5	"	NO Rec. Sandy	
111.5-121	"		
121-125	"	SANDY	
125-132	"	SANDY to crumbly lime stone (light color)	
132-139.5	"	SANDY - light colored some what sticky	~7' (6' in)
139.5-145	"	much more congl. very shelly porous moldic	~4'

DEPTH METH

SAMPLE

REC/PROB.

145-152

soft rock
VANEDV. POUROUS SANDY
Shelly moldic RockTAKING
WATER
4 1/2' Rec.

152-161

" "

softer - sticky SAND

Rec = 4 1/2'

161-163

FINE SAND

G.D. REC. Centrifugal pump

8' Rec.

163-175

" "

Cent. Pump

4 1/2' Rec.

175-181

" "

" "

7 1/2' Rec.
FROM
previous run

181-191

" "

" "

9.5' Rec.

SAND BOX 13
183

" "

" "

191-193

cent. Pump
sticky SAND

50' Rec.

193-201

couldn't pump G.D. Rec.

w/cent. So pushed

bottom
5-6'

SANDY to clayey

I - 75s ^{MM.} 57.7

0 - 3.5 MD Rock stripped out threads on 2" CORE BARREL Roller Bit Took cuttings through HARD ROCK be out crop Rpp. Sample of hard rock in CORE BOX

3.5 - 8 Push core Limy mud w/ shell + Rock fragments to Yellowish tannish sand V. Fine = 3.5' Rec.

8 - 13 " " = 5' Limy mud w/ shell Prob. stuff - mostly whitish to yell + tannish sand V. Fine = 3.5' Rec.

13 - 18 " " V. Fine off white to tannish sand = 4' Rec.
END BOX 1

18 - 23 " " " " = 2' Rec.

23 - 28 " " Somewhat lighter in color = 2' Rec.
END BOX 2 1st APPROX 6" PROB. FROM PREV. RUN or STUFF * Block was at end of run instead of beginning

28 - 29 " " off white to tannish sand V. Fine 6D Rec.

29 - 34 " " " " = 4.5' Rec.

34 - 38 " " " " 6D Rec.
END BOX 3

38 - 41 " " w/ Large shells, Rock + barnacles " "

41 - 44 " " off white sand V. Fine w/ some larger shell fragments 6D Rec.
END BOX 4 (= 1.5' PROB stuff)

I-75	mm	57.7	cont.
ALLIGATOR ALLEY		E.	

44-47	wire lined	still sticky off white	GD Rec.
		Tan sound	

47-515	n n	n	n		poor fec. 2-3" sand
--------	-----	---	---	--	------------------------

51.5-55	W v	SABIES TOP to somewhat darker clay riv	GP Rec.
END BOX 5	"	"	"

55.61	" "	(Sander Top - Prob stuff) Prob = 1.5' stuff	Prob = 5' Real Rec.
END BOX 6		To Darker Clay blk	

61-70	n = 11	Tannish-greenish somewhat higher w/ higher carb. %	delayed GD Rec.
-------	--------	--	--------------------

76-79	n n	GRAYISH - sticky Higher carb. comp w/ shell Somewhat more competent	= 6.5' Rec.
-------	-----	---	-------------

79-84	n n	Compensent - porous broken grey L.R w/shell + shell molds	= 4' Rec.
Box 8			

84-91	n n	¹² / ₁₀ h	n n	2 4' Rel.
-------	-----	---------------------------------	-----	-----------

91-97	n 1.	some what lighter in color otherwise similar as previous	= 4' Rec.
-------	------	--	-----------

97-101	11	11	11	11	= 2.5' Re.
END Box					

101-108	" "	"	"	"	2/6 Rec.
---------	-----	---	---	---	----------

108-115	" "	" "	" "	GD Rec.
END BOX 10		Some what more	compt.	

I-15 g. Cont^{mm} 57.7

115-121 | Lungs gray to off white
| Porous L.R. w/ shell mould, 60 Rec.
| END BOX |

121-128	h 21	"	"	"	"	POOR REC = 1'
			started out sunny	but turned less compt.	+ sandier prohibiting Recovery	

128+132	n n	sandy w/ Limey comp. + some shell	= 3' Rec.
---------	-----	--------------------------------------	-----------

C36-	Cont. Next PAGE
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Kelley 20.25 To Tub
19' in Ground

5' 8" - 7' 4"
Surface To
Tub
Base
= 4' 4"
in Ground

PRISON #2

26 18 25.452

81 15 43.341

Nobles Hunt Camp

74-118' Lime Rock

30' screen

85-115

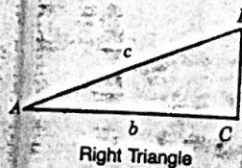
75-115

10-30'
distance

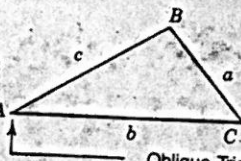
Micrite - Carbonate
mudstone

Marl - Carbonate mud
Composite mixture
terrigenous clay
siliclastic clay

TRIGONOMETRIC FORMULAE



Right Triangle



Oblique Triangles

Solution of Right Triangles

For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\csc = \frac{c}{a}$

Given	Required	
A, B, c	A, B, c	$\tan A = \frac{a}{b} = \cot B$, $c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B$, $b = \sqrt{(c+a)(c-a)} = c \sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90^\circ - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90^\circ - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90^\circ - A$, $a = c \sin A$, $b = c \cos A$

Solution of Oblique Triangles

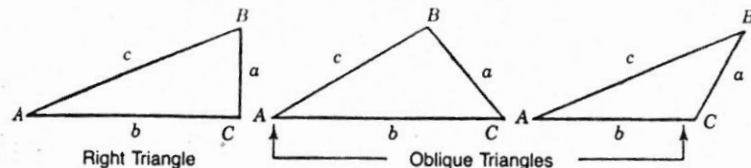
Given A, B, a	Required b, c, C	$b = \frac{a \sin B}{\sin A}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180^\circ - C$, $\tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{a + b}$, $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a + b + c}{2}$, $\sin \frac{1}{2}A = \sqrt{\frac{(s - b)(s - c)}{b c}}$, $\sin \frac{1}{2}B = \sqrt{\frac{(s - a)(s - c)}{a c}}$, $C = 180^\circ - (A + B)$
a, b, c	Area	$s = \frac{a + b + c}{2}$, $\text{area} = \sqrt{s(s - a)(s - b)(s - c)}$
A, b, c	Area	$\text{area} = \frac{b c \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = 5° 10'. From Table, Page IX, $\cos 5^\circ 10' = .9959$. Horizontal distance = $319.4 \times .9959 = 318.09$ ft.
Horizontal distance also = Slope distance minus slope distance times (1 - cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained. Cosine 5° 10' = .9959. $1 - .9959 = .0041$. $319.4 \times .0041 = 1.31$. $319.4 - 1.31 = 318.09$ ft.

When the rise is known, the horizontal distance is approximately - the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance = $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.



Solution of Right Triangles

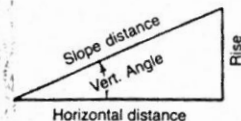
For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\csc = \frac{c}{a}$

Given a, b	Required A, B, c	$\tan A = \frac{a}{b} = \cot B$, $c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B$, $b = \sqrt{(c+a)(c-a)} = c \sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90^\circ - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90^\circ - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90^\circ - A$, $a = c \sin A$, $b = c \cos A$

Solution of Oblique Triangles

Given A, B, a	Required b, c, C	$b = \frac{a \sin B}{\sin A}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180^\circ - C$, $\tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{a + b}$, $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a + b + c}{2}$, $\sin \frac{1}{2} A = \sqrt{\frac{(s - b)(s - c)}{b c}}$, $\sin \frac{1}{2} B = \sqrt{\frac{(s - a)(s - c)}{a c}}$, $C = 180^\circ - (A + B)$
a, b, c	Area	$s = \frac{a + b + c}{2}$, $\text{area} = \sqrt{s(s - a)(s - b)(s - c)}$
A, b, c	Area	$\text{area} = \frac{b c \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = $5^\circ 10'$. From Table, Page IX. $\cos 5^\circ 10' = .9959$. Horizontal distance = $319.4 \times .9959 = 318.09$ ft.

Horizontal distance also = Slope distance minus slope distance times (1 - cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained. $\cos 5^\circ 10' = .9959$. $1 - .9959 = .0041$. $319.4 \times .0041 = 1.31$. $319.4 - 1.31 = 318.09$ ft.

When the rise is known, the horizontal distance is approximately: - the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance = $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.