

Drill Hole No. MH-33

Date: 1/26/78

Bearing: N 20 E Inclination: 80°N

Drilled By: Boyles Bros. Ralph Jex
Roy Wisener

Coordinates: North 629, 169.47 East 449, 625.55

Logged By: Ferryl C. Gale

Elevation: 1096.18

Air Rotary: 0.0-20.0
Total Depth: 687.0 Core: 20-687.0

DEPTH		%	SAMPLE	SAMPLE	ANALYSES			DESCRIPTION OF MATERIAL DRILLED
FROM	TO	RECOVERY	NUMBER	INTERVAL	Sp. Gr.	BaSO ₄		
0.0	5.0	0		0				Set casing in hole
5.0	10.0	70%		5.0'				Buff color colluvium, weathered to sand and clays, large fragments of novaculite, oxidized zone.
10.0	15.0	60		5.0'				Gray color, sandstone & shales.
15.0	20.0	60		5.0'				Gray, sandstone & shales.
			Begin Coring					Hit too much water for air rotary.
20.0	31.9	100						Gray, fine-grained sandstone, well-cemented, broken & fractured w/ orange iron oxide or limonite staining along fractures, thin lamina of black shale (0.1 wide) locally.
31.9	44.3	100						Gray fine-grained sandstone, well cemented, (43.0-44.3 qtz thread filled fractures). qtz threads dipping at 76°S.
44.3	51.0	100						Gray sandstone, as above plus numerous qtz thread & stringers, highly leached vuggs.
51.0	56.4	100						Gray fine-grained sandstone; well-cemented (53.0-53.5) qtz filled fractures, highly broken, leached vuggs.
56.4	59.5	100						Gray sandstone as before plus (57.3-57.6

Drill Hole No. MH-33

Date: 1/27/78

Bearing: Inclination:

Drilled By:

Coordinates: North East

Logged By:

Elevation:

Total Depth:

DEPTH		%	SAMPLE	SAMPLE	ANALYSES			DESCRIPTION OF MATERIAL DRILLED
FROM	TO	RECOVERY	NUMBER	INTERVAL	Sp. Gr.	BaSO ₄		
								gnarled interbedded black shale and gray sandstone).
59.5	62.5	100						Black shale w/ lenses of gray sandstone interbedded. Bedding Dip 73°S.
62.5	66.6	100						Gray sandstone as before plus wisps of black shale locally.
66.6	67.6	100						Interbedded black shales and gray sandstone, gnarled appearance of bedding, wisps of black shale.
67.6	77.4							Gray, fine-grained sandstone; well-cemented, very uniform.
77.4	88.5							Gray, fine-grained sandstone; well-cemented, very uniform.
88.5	90.5							Interbedded gray and black sandstone.
90.5	99.2							Gray, fine-grained sandstone, well cemented; very uniform.
99.2	102.0	100						Gray fine-grained sandstone; well cemented, very uniform.
102.0	111.5	100						Interbedded gray & black sandstone & black shale lamina. Bedding dip 76°S.

Drill Hole No. MH-33

Date: 1/29/78

Bearing: N 20 E Inclination: 80°N

Drilled By:

Coordinates: North East

Logged By:

Elevation:

Total Depth:

DEPTH		% RECOVERY	SAMPLE NUMBER	SAMPLE INTERVAL	ANALYSES			DESCRIPTION OF MATERIAL DRILLED
FROM	TO				Sp. Gr.	BaSO ₄		
111.5	119.8	100						Dark gray to gray sandstone; well cemented, (111.8-111.9 mud seam) fractures filled w/ carbon.
119.8	120.0	100						Gray sandstone.
120.0	122.5	100						Interbedded gray sandstone & black shale lamina; bedding dip 76 S.
122.5	126.0	100						Gray fine-grained sandstone, well-cemented, carbon filled fractures.
126.0	128.0	100						Black shale, Marcasite along fractures.
128.0	130.5	100						Gray sandstone, well-cemented.
130.5	131.5							Black shale; carbon rich locally; marcasite in fractures.
131.5	133.0							Gray fine-grained sandstone.
133.0	135.0							Black shale interbedded w/ thin lamina of gray sandstone; bedding dip 70 S.
135.0	142.8							Interbedded lenses of gray & black sandstone w/ black shale. (two qtz filled fractures 139.0)
142.8	147.0							Gray sandstone fine-grained, occ. qtz threads filling fractures; also carbon filled fractures

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Date: 1/29/78

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Drilled By: _____

Coordinates: North _____ East _____

Logged By: _____

Elevation: _____

Total Depth: _____

DEPTH		%	SAMPLE	SAMPLE	ANALYSES			DESCRIPTION OF MATERIAL DRILLED
FROM	TO	RECOVERY	NUMBER	INTERVAL	Sp. Gr.	BaSO ₄		
147.0	154.3							Black shales interbedded w/ sandstone; locally wisps of black shale in sandstone. Bedding dip 73°S.
154.3	154.9							Gray fine grained sandstone, well cemented.
154.9	156.0							" " " "
156.0	164.0							Gray fine grained sandstone; (156.0-156.5 thin black lamina of shales interbedded w/ gray sandstone) (160.0-160.5 thin black shale lamina.) Bedding dip 74°S.
164.0	175.8							Gray fine-grained sandstone; locally darker gray; (black shale lamina 175.0-175.2) Bedding dip: 75 S.
175.8	187.4							Gray fine-grained sandstone; well-cemented (179.9-180.5 darker gray sandstone w/ wisps of black shale.)
187.4	199.2							Gray fine-grained sandstone as before, (darker sandstone 188.4-189.4) Bed dip 82°S. Black shale lamina 194.8-195.6 grading back into gray sandstone.
199.2	203.0							Gray fine-grained sandstone, well-cemented, locally darker gray.

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Elevation: _____

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DEPTH		%	SAMPLE	SAMPLE	ANALYSES			DESCRIPTION OF MATERIAL DRILLED
FROM	TO	RECOVERY	NUMBER	INTERVAL	Sp. Gr.	BaSO ₄		
203.0	207.4							Black shale; marcasite patches at contact; Bedding dip 77°S. Leaching in small fractures.
207.4	210.0							Gray fine-grained sandstone w/ occ. wisps of black shale.
210.0	220.2							Gray sandstone as before plus qtz. stringers (0.05 ft. wide) 217.0-219.0. Dark gray locally.
220.2	233.5							Dark gray sandstone; thread fractures filled w/ qtz (228.5-229.5 black shale; rich in carbon; lost core)
233.5	244.3							Gray fine-grained sandstone; well cemented darker gray locally; thread fractures filled w/ qtz; fractures leached locally; (241.8-242.2 black silty shale; broken) Bedding dip 71°S.
244.3	255.0							Gray fine-grained sandstone; very uniform;
255.0	266.5							" " " "
266.5	278.5							Gray fine grained sandstone; well cemented thread fractures filled w/ qtz.
278.5	283.7							Gray, fine-grained sandstone; well cemented

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Date: 1/31/78

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Drilled By: _____

Coordinates: North _____ East _____

Logged By: _____

Elevation: _____

Total Depth: _____

DEPTH		%	SAMPLE	SAMPLE	ANALYSES			DESCRIPTION OF MATERIAL DRILLED
FROM	TO	RECOVERY	NUMBER	INTERVAL	Sp. Gr.	BaSO ₄		
								Darker gray locally; thread fractures filled w/ qtz.
283.7	284.5							Black shale; rich in carbon; marcasite patches; very broken may be possible? fault (minor movement?0 Bedding dip 83°S.
284.5	289.0							Dark gray silty shale grading into gray sandstone w/ wisps of black shale locally.
289.0	298.5							Gray finegrained sandstone; darker gray and broken locally:
298.5	311.4							Gray fine-grained sandstone; well cemented some small fractures filled w/ carbon; scattered wisps of black shale; medium fracturing.
311.4	324.1							Gray sandstone interbedded w/ black silty shale; gnarled appearance; wisps of black shale in sandstone locally. Bed dip 82°S.
324.1	332.0							Dark gray fine-grained sandstone; well cemented; fractures filled w/ carbon; occ. wisps of black shale. Bedding dip 86°S.
332.0	344.7							Dark gray fine-grained sandstone; scattered

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Date:

Bearing:
Inclination:

Drilled By:

Coordinates: North
East

Logged By:

Elevation:

Total Depth:

DEPTH		%	SAMPLE	SAMPLE	ANALYSES			DESCRIPTION OF MATERIAL DRILLED
FROM	TO	RECOVERY	NUMBER	INTERVAL	Sp. Gr.	BaSO ₄		
								wisps of black shales; shaley locally; gnarled appearance locally.
344.7	355.6							(344.0-354.0 one 10 ft. run of unbroken core when came out of core tube.) Dark gray fine-grained sandstone w/ mottled appearance; wisps of black shale; Bedding dip 78°S.
355.6	358.0							Dark gray fine-grained sandstone; well cemented; wisps of gray sandstone;
358.0	359.0							Dark gray shale, w/ sand lamina and disseminated marcasite lamina; grading into dark gray sandstone.
359.0	366.7							Dark gray fine grained sandstone; well cemented; carbon & qtz filled fractures (365.8-366.2 thinly interbedded black shale & gray sandstone.) Bedding dip 72°S.
366.7	377.8							Dark gray fine-grained sandstone; well cemented (369.0-372.0 qtz thread & stringers filled fractures; highly broken) (372.0-373.0 mottled appearance w/ carbon & qtz filling

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 Date: 1/31/78

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Drilled By: _____

Coordinates: North _____ East _____

Logged By: _____

Elevation: _____

Total Depth: _____

DEPTH		%	SAMPLE	SAMPLE	ANALYSES			DESCRIPTION OF MATERIAL DRILLED
FROM	TO	RECOVERY	NUMBER	INTERVAL	Sp. Gr.	BaSO ₄		
								fractures) continues in Dark gray sandstone.
377.8	378.8							Dark gray fine-grained sandstone.
378.8	380.5							Black shale, carbon rich, grading back
								into dark gray sandstone;
380.5	388.5							Dark gray fine-grained sandstone; locally
								not as well cemented; gypsum fracture fillings.
388.5	399.3			Box 34				Gray fine-gr. sandstone; gypsum filled
								fracture weak; wisps of black shale locally.
399.3	406.0							Gray fine-gr. sandstone; gypsum filled
								fractures, interbedded w/ black shale lamina
								(black shale carbon rich) Bedding dip 60° S.
406.0	410.3			Box 35				Black silty shale interbedded w/ lamina of
								gray sandstone; Bedding dip 75 S. Marcasite
								patches in black shale.
410.3	421.5			Box 36				Dark gray fine-gr. sandstone interbedded w/
								lamina of black silty shales; wisps of black
								shale locally (418.2-418.6 rich in carbon
								leached appearance)
421.5	423.0							Gray fine-gr. sandstone; well cemented; thin
								lamina of black shales. Bedding dip 89 S.

Drill Hole No. MH-33

Date: 1/31/78

Bearing: _____ Inclination: _____

Drilled By: _____

Coordinates: North _____ East _____

Logged By: _____

Elevation: _____

Total Depth: _____

DEPTH		% RECOVERY	SAMPLE NUMBER	SAMPLE INTERVAL	ANALYSES			DESCRIPTION OF MATERIAL DRILLED
FROM	TO				Sp. Gr.	BaSO ₄		
423.0	426.4							Black shale; nodules of marcasite Bed dip 89S
426.4	429.5		2752	3.1'				Barite zone; low grade app. 15% barite, spherical nodules scattered in black shale; also carbon rich nodules.
429.5	431.3		2753	1.8'				Medium grade barite app 60%; barite nodules aligned along bedding. Bedding dip 87°S; banded appearance w/ barite & black shales.
431.3	433.3		2754	2.0'				Low grade app. 10% Barite, scattered spherical nodules in black shales.
433.3	435.6		2755	2.4'				Med. grade app. 40% barite nodules aligned along bedding; barite interbedded w/ black shale giving banded appearance; bedding dip.
435.7	439.6		2756	3.9'				Med. grade app 40-50%, locally large nodules aligned along bedding & small nodules aligned along bedding; banded appearance w/ black shales; Bedding dip 84°S. & 81°S.
439.6	441.8		2757	2.2'				Low to med. grade Barite app. 30-40% fine grained barite nodules interbedded w/ black shales.
441.8	444.0		2758	3.2'				Med grade, app. 40% Barite, large nodules

Drill Hole No. MH-33

Date: 2/1/78

Bearing: _____ Inclination: _____

Drilled By: _____

Coordinates: North _____ East _____

Logged By: _____

Elevation: _____

Total Depth: _____

DEPTH		%	SAMPLE	SAMPLE	ANALYSES			DESCRIPTION OF MATERIAL DRILLED
FROM	TO	RECOVERY	NUMBER	INTERVAL	Sp. Gr.	BaSO ₄		
								scattered throughout black shales; (at 442.0-442.5 gray mud or decomposed shales w/ scattered barite nodules) weak dissiminated marcasite.
444.0	448.0	75%	2759	4.0'				Low to med. grade app. 30% Barite; thin elongated barite nodules along bedding. Host rock black shale; rich in carbon locally, (very broken, core loss between 445.0-448.0)
448.0	451.0	95%	2760	3.0'				Med grade app. 60% barite; large nodules of barite almost massive; grading to elongated nodules along bedding: Bedding dip 89S
451.0	454.5		2761	3.5'				Med. grade app 60% Barite; individual elongated nodules along bedding to abundant spherical nodules in black shale; weak disseminated marcasite.
454.5	457.0		2762	2.5'				Low grade app. 20% Barite; scattered elongated barite nodules along bedding.
457.0	460.9		2763	3.9'				Med grade app 40% Barite; elongated barite nodules along bedding w/ spherical nodules. Host rock black shale.

Drill Hole No. MH-33

Date: 2/2/78

Bearing: _____ Inclination: _____

Drilled By: _____

Coordinates: North _____ East _____

Logged By: _____

Elevation: _____

Total Depth: _____

DEPTH		% RECOVERY	SAMPLE NUMBER	SAMPLE INTERVAL	ANALYSES			DESCRIPTION OF MATERIAL DRILLED
FROM	TO				Sp. Gr.	BaSO ₄		
460.9	461.9		2764	1.0'				Interbedded gray & black shales w/ weakly scattered small nodules of barite;
461.9	467.5							Gray & black shales decomposed to clays & mud!! Highly broken; locally carbon rich; graphitic.
467.5	478.0							Gray & black shales highly decomposed locally to clays & mud; broken locally carbon rich; graphitic.
478.0	481.3		2765	3.3'				(Very low grade) app. 5% Barite, very scattered small barite nodules.
481.3	491.8							Gray decomposed silty shales; graphitic.
491.8	504.0							Gray decomposed silty shales; graphitic, locally decomposed to gray mud!!.
504.0	506.0							Gray decomposed silty shales; decomposed to mud.
506.0	515.2							Lt. gray silty sandstone, gypsum filling fractures; locally thin lamina of gray shales & clays.
515.2	526.4							Lt. gray sandstones & shales, locally thin lamina of gray shales interbedded w/ sandstone;

Drill Hole No. MH-33

Date: 2/2/78

Bearing: _____ Inclination: _____

Drilled By: _____

Coordinates: North _____ East _____

Logged By: _____

Elevation: _____

Total Depth: _____

DEPTH		%	SAMPLE	SAMPLE	ANALYSES			DESCRIPTION OF MATERIAL DRILLED
FROM	TO	RECOVERY	NUMBER	INTERVAL	Sp. Gr.	BaSO ₄		
								gradation contacts. (523.0-526.0 very broken possibly nearing fault.) Some fractures filled w/ gypsum. Bedding dip 79°S.
526.4	532.0							Lt. gray silty sandstone grading into dark gray shales.
532.0	537.0							Highly decomposed lt. gray shales, decomposed to clay & mud.
537.0	539.7							Lt. gray silty sandstone, w/ thread fractures filled w. gypsum.
539.7	541.0							Possible fault zone (no sample recovery)
541.0	542.5							Highly decomposed lt. gray shale.
542.5	559.9							Highly fractured & sheared silty sandstone; lt. gray color.
559.9	576.0							Lt. gray silty shales; w/ thin lamina of shales & sandstone. Bedding Dip 81 S.
								(575.5-576.0 Darker gray shale carbonaceous)
576.0	586.0							(1.5 ft. recovered) fault; highly broken. Brecciated, decomposed to clays & lt. gray clays & shales.
586.0	596.0							(recovered app 5.0') fault; highly broken

Drill Hole No. MH-33

Date: 2/8/78

Bearing: _____ Inclination: _____

Drilled By: _____

Coordinates: North _____ East _____

Logged By: _____

Elevation: _____

Total Depth: _____

DEPTH		%	SAMPLE	SAMPLE	ANALYSES			DESCRIPTION OF MATERIAL DRILLED
FROM	TO	RECOVERY	NUMBER	INTERVAL	Sp. Gr.	BaSO ₄		
								Brecciated; decomposed to shale; locally dark gray color.
596.0	611.5							Dark gray shales, brecciated, decomposed to clays. Locally lt. gray color.
611.5	615.8							Lt. gray shales; highly decomposed (3.0 ft. recovery)
615.8	617.8	50	2766					Barite zone; large nodules of barite med. grade 40-50% aligned along bedding; interbedded w/ gray & black shales. This zone is highly fractured & broken, it appears that the shale that are interbedded have been washed away, accounting for core loss. This barite is on the back thrown block across the earlier fault. Bed dip 76°S.
617.8	624.0	50	2767					Thinly bedded barite interbedded w/ lt. & dark lamina of shales. Medium to low grade app. 30% Barite.
624.0	627.0		2768					Very low grade Barite; scattered nodules. app. 5% Barite.
627.0	629.0		2769					Dark gray shales w/ scattered nodules of app. 10% Barite.

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Date: 2/8/78

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Drilled By: _____

Coordinates: North _____ East _____

Logged By: _____

Elevation: _____

Total Depth: _____

DEPTH		%	SAMPLE	SAMPLE	ANALYSES			DESCRIPTION OF MATERIAL DRILLED
FROM	TO	RECOVERY	NUMBER	INTERVAL	Sp. Gr.	BaSO ₄		
629.0	632.0	70	2770					Black shales w/ random scattered large barite nodules (0.05') (app. 1/2 inch across)
632.0	636.0		2771					Very low grade scattered nodules app. 5% Barite in dark gray shale.
636.0	639.0							Lt. & dark gray interbedded shales, carbon rich locally; graphitic.
639.0	641.0							Black shale; carbon rich
641.0	644.0							Gray shales; lt. gray in color
644.0	647.5		2772					Barite zone; scattered nodules app. 15% Barite; (646.0-647.5 carbon rich w/ scattered nodules) graphitic shales.
647.5	649.5							Black shales; rich in carbon grading to lt. gray shales.
649.5	662.8							Lt. gray shales or claystone; altered locally & enriched in carbon. Darker gray locally due to the carbon, moderately fractured, occ. wisps of black shale
662.8	686.1							Lt. gray shales or claystone, highly fractured occ. wisps of black shale in gray claystone.
686.1	687.0							Ark. Novaculite, cherty locally also sandy

Bottomed on novaculite.

or very leached, porous.

Total Depth: _____

10/77

Samples Shipped to Houston

MH-33

<u>Sample</u>	<u>Footage</u>	<u>Specific Gravity</u>	<u>% BaSO4</u>
MH-33-2752	426.4-429.5		
-33-2753	429.5-431.3		
-33-2754	431.3-433.3		
-33-2755	433.3-435.7		
-33-2756	433.7-439.6		
-33-2757	439.6-441.8		
-33-2758	441.8-444.0		
-33-2759	444.0-448.0		
-33-2760	448.0-451.0		
-33-2761	451.0-454.5		
-33-2762	454.5-457.0		
-33-2763	457.0-460.9		
-33-2764	460.9-461.9		
-33-2765	478.2-481.3		
-33-2766	615.8-617.8		
-33-2767	617.8-624.0		
-33-2768	624.0-627.0		
-33-2769	627.0-629.0		
-33-2770	629.0-632.0		
-33-2771	632.0-636.0		
-33-2772	644.0-647.5		

FANCY HILL - DIAMOND DRILL HOLES
INDIVIDUAL CORE ANALYSES BY INTERVALS

SAMPLE	LOG #	DEPTH	INTERVAL	A.P. SPECIFIC GRAVITY	CALCULATED % BaSO ₄
MDDH 33					
2752	1900	426.4-429.5	3.1	2.879	10.69
2753	1901	429.5-431.3	1.8	2.941	15.98
2754	1902	431.3-433.3	2.0	2.998	20.65
2755	1903	433.3-435.7	2.4	3.030	23.19
2756	1904	435.7-439.6	3.9	3.089	27.75
2757	1905	439.6-441.8	2.2	3.021	22.48
2758	1906	441.8-444.0	2.2	3.018	22.25
2759	1907	444.0-448.0	4.0	3.256	39.74
2760	1908	448.0-451.0	3.0	3.322	44.15
2761	1909	451.0-454.5	3.5	3.405	49.45
2762	1910	454.5-457.0	2.5	3.139	31.47
2763	1911	457.0-460.9	3.9	3.107 3.162	29.1 33.15
2764	1912	460.9-461.9	1.0	2.851	8.23
2765	1913	478.2-481.3	3.1	2.827	6.07
2766	1914	615.8-617.8	2.0	3.100	28.58
2767	1915	617.8-624.0	6.2	3.048	24.60
2768	1916	624.0-627.0	3.0	2.838	7.06
2769	1917	627.0-629.0	2.0	2.793	2.96
2770	1918	629.0-632.0	3.0	2.867	9.64
2771	1919	632.0-636.0	4.0	2.774	1.19
-	-	636.0-644.0	8.0	2.761	0.00
2772	1920	644.0-647.5	3.5	2.800	3.61
		Total	62.3		
		Weighted Average		2.992	20.13