

TABLE 3—(Continued)

	STARR COUNTY						UVALDE COUNTY			VAL VERDE COUNTY		VICTORIA COUNTY	WEBB COUNTY				
Min. Tech. Lab. No.	60199	60200	60201	60202	60203	60204	60127	60128	60150	60236	60242	60342	60164	60165	60166	60167	60168
Field locality No. <sup>a</sup>	1	2A	2B	3	4	8	10	11	30	10A	14B	3	3	4	5	6	7
Free lime (carbonates)	Positive	Positive	Positive	Negative	Positive	Negative	Negative	Negative	Positive	Positive	Positive	Positive	Negative	Negative	Positive	Negative	Negative
Benzidine test	Negative	Negative	Faint blue	Blue	Bluish	Faint blue	Blue	Negative	Blue-green	Faint blue	Negative	Faint blue	Blue-gray	Negative	Blue gray	Deep blue	Negative
Color (air-dried)	Tan	Tan	Light brown	Dark cream	Tan	Light tan	Light buff	Dark buff	Light cream	Greenish dark buff	Tan	Cream	Tan	Pink	Greenish gray	Tan	Dark brown
Oil absorption—																	
Calcline 450°C	----	----	----	----	----	----	27	----	----	----	----	----	38	----	----	----	----
Air-dried	41	Fast	Slow	Medium	Medium	Slow	25	Slow	Fast	Medium	Slow	Medium	44	Slow	Slow	41	Slow
Moisture (H <sub>2</sub> O-) (%)	4.62	6.40	4.37	7.72	5.54	4.92	5.62	0.67	6.03	3.12	0.90	2.71	4.28	0.39	5.31	6.83	6.13
Ignition loss—																	
300–600°C (%)	4.26	3.56	3.86	2.80	4.10	2.12	3.56	1.10	12.70	5.03	3.08	3.42	1.69	0.43	5.43	4.63	12.56
105–1050°C (%)	10.91	6.79	10.65	6.31	8.69	6.30	11.84	2.92	31.05	11.71	17.80	26.53	3.93	2.27	11.76	8.31	22.02
Water of plasticity																	
(Atterberg test)—																	
Average (%)	53	53	51	35	88	38	62	46	68	45	25	52	46	41	65	81	50
Difference (%)	78	57	46	18	107	10	22	6	38	33	28	58	30	3	53	63	11
Swelling test (percent																	
increase in volume)—																	
In distilled water	141	122	88	15	430	7	117	35	118	80	30	105	78	55	290	126	41
In salt water	64	52	68	30	58	11	40	39	100	70	32	68	52	31	45	96	23
Slaking test (–100 mesh) (%)	79	85	68	25	57	24	43	<2	30	15	<5	7	62	<5	95	14	<8
Bloating test: 10 minutes at—																	
2000°F	----	Negative	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2200°F	----	Negative	----	Positive	----	----	Negative	----	----	----	----	----	----	Negative	----	----	----
2400°F	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Yield of 15 cp. drilling mud																	
(bbl. per ton)—																	
Untreated	----	----	----	----	Very low	----	----	----	----	----	----	----	----	----	----	Very low	----
Treated with soda ash	----	----	----	----	47	----	Very low	----	----	----	----	----	----	----	Very low	Very low	----
pH value	9.2	9.3	8.8	8.3	9.3	8.3	8.7	8.5	7.9	7.8	8.7	8.7	8.7	8.0	9.5	5.3	3.8
Decolorizing efficiency compared																	
to AOCS official clays—																	
Natural with natural (%)	----	----	----	----	Very low	----	Very low	----	----	----	----	----	----	----	----	42	----
Activated with activated (%)	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	41	----
Firing test—																	
Powder—2200°F (1204°C)	Dark brown Fused	Brown Fused	Brown Fused	Brown Fused	Brown Fused	Dark brown Fused	Gray Vitrified	Brown Vitrified	White Sintered	Gray Fused	Tan Sintered Friable Brown Fused	Brown Fused	Brown Steel hard	Tan Steel hard	Dark brown Fused	Light buff Steel hard	Tan Steel hard
2400°F (1316°C)	----	----	----	----	----	----	Light gray Fused	Black Fused	White Vitrified White Fused	----	----	----	Dark brown Fused	Brown Vitrified	----	Light gray >Steel hard Dark cream >Steel hard	Dark gray Vitrified Brown Vitrified
2600°F (1427°C)	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Disks, ½-inch diameter—																	
(Approx. cone 02) 2000°F (1093°C)	Tan Steel hard	Brick red Steel hard	Tan Steel hard	----	Brick red Steel hard	----	----	----	----	Brown >Steel hard Dark brown Fused	----	----	----	----	----	----	----
(Approx. cone 7) 2200°F (1204°C)	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
(Approx. cone 15) 2600°F (1427°C)	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Loss on ignition at—																	
105–300°C	1.55	1.57	1.62	2.73	1.17	3.31	7.07	1.24	1.73	1.06	0.58	1.72	1.30	0.98	1.20	1.22	6.64
300–450°C	1.36	0.94	1.13	1.48	1.07	1.31	1.25	0.39	1.02	1.90	2.03	0.83	0.77	0.29	1.01	0.82	7.33
450–600°C	2.90	2.62	2.73	1.32	3.03	0.81	2.31	0.71	11.68	3.13	1.79	2.59	0.92	0.14	4.42	3.81	5.23
600–900°C	4.94	1.60	5.14	0.69	3.38	0.80	1.06	0.44	14.67	} 5.62	} 13.40	} 21.39	0.75	0.15	4.99	2.14	2.30
900–1050°C	0.16	0.06	0.03	0.09	0.04	0.07	0.15	0.14	1.95				0.19	0.71	0.14	0.32	0.52
Neutralization value as CaCO <sub>3</sub>	17.0	8.4	17.6	----	12.4	----	----	----	2.2	15.4	33.9	52.5	----	----	16.9	----	----

Remarks<sup>b</sup> (samples arranged by Min. Tech. Lab. numbers)—

No. 60199 NIIU as a clay ECB. Contains 17.0% carbonates NV.

No. 60200 NIIU as a clay ECB. Contains 8.4% carbonates NV.

No. 60201 NIIU as a clay ECB. Contains 17.6% carbonates NV.

No. 60202 According to the statements received with samples 60199, 60200, and 60201 these clays come from a brick clay pit in operation. The high lime content of these clays, especially of samples 60199 and 60201 would tend to shorten the firing range. Pellets of this clay can be bloated to an apparent density of 50 pounds per cubic foot by heating for 10 minutes at 2200°F. This material should be further tested by a specialized laboratory as a raw material for lightweight concrete aggregate.

No. 60203 A bentonite capable of yielding 47 barrels of 15-cp drilling mud per ton of clay when treated with sodium carbonate. It might be possible to increase this yield by varying the chemical treatment. FTR. Contains 12.4% carbonates NV. Low oil decolorizing capacity.

No. 60204 Mainly non-clay. No carbonates (free lime) detected. The rock is tuff with numerous glass shards, silt-size quartz (20%) with magnetite, and minor amounts of ilmenite, leucoxene, biotite and zircon.

No. 60127 Very low yield of drilling mud. Very low oil decolorizing capacity. Very low oil absorbing capacity. NIIU.

No. 60128 NIIU as a clay. Predominantly non-clay. Consists of fine silt with trace of quartz.

No. 60150 Should be further tested. Very low oil absorbing capacity.

No. 60236 NIIU as a clay ECB. A calcareous clay containing 15.4% carbonates NV.

No. 60242 NIIU as a clay. A calcareous clay containing 33.9% carbonates NV.

No. 60342 NIIU as a clay. Contains 52.3% carbonates NV.

No. 60164 NIIU as a clay. Low oil absorbing capacity.

No. 60165 NIIU as a clay.

No. 60166 NIIU as a clay. Low yield of drilling mud even when treated with sodium carbonate.

No. 60167 A subbentonite which can be acid-activated to show an oil decolorizing capacity of 41% as compared with the official AOCS activated earth. FTR. Low oil absorbing capacity.

No. 60168 NIIU as a clay. Contains appreciable amount of organic matter.

<sup>a</sup> See Plate 2 for location.

<sup>b</sup> The following abbreviations are used:

AOCS=American Oil Chemists' Society.

FTR=Further testing by a specialized laboratory is recommended.

NIIU=No important industrial (or commercial) use.

NV=Neutralization value expressed as calcium carbonate.

ECB=With the possible exception of common brick. Clays containing as high as 20% carbonates have been included in this classification because there are several plants in operation in Texas producing brick from such clays. Normally it is not desirable to use clays containing more than 3% carbonates (U.S. Bureau of Mines Bulletin 565). The presence of excessive carbonates (lime and magnesia) causes undue shrinkage and shortening of the firing range. Closely regulated firing is required to overcome the latter.

15-CP=15-centipoise.