

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY ^{1/}

Core samples from the Laramie Energy Research Center's White Mountain
Corehole No. 3 drilled in 1975 in NE1/4NE1/4 (268 FNL, 507 FEL) of
sec 18, T 19 N, R 105 W, Sweetwater County, Wyoming

Surface elevation: 7,549 feet

Described interval: 63.0-228.7 feet

From	To	Description
63.0	77.0	Sandstone: Yellow buff, fine grained. Faint bedding marked by very fine carbonaceous layers; rarely massive. Regular to irregular thick to thin parting; slightly hackly to irregular fracture; permeable.
77.0	79.2	Mudstone: Light brownish gray, some yellow buff, very slightly calcareous. Faint irregular streaked bedding and rare laminae and bands. Irregular thick to medium parting; irregular fracture. Very irregular contact with sandstone above.
79.2	80.4	Mudstone and marlstone: Buff to gray, slightly to very calcareous. Faintly banded and laminated. Irregular to regular thick to thin parting; fairly regular to hackly fracture. Brownish-gray oil shale layer at 79.5-79.6. Very thin rusty brown porous mudstone streaks at 79.6.
80.4	81.5	Marlstone: Buff to light brownish gray, calcareous, silty. Faint slightly irregular laminae; rarely wavy and displaced. Regular to some irregular thick to thin parting; irregular to fairly regular fracture.
81.5	83.0	Missing
83.0	83.6	Marlstone and oil shale: Buff to medium and rare dark brownish gray, dolomitic. Faint to moderately distinct distorted and displaced streaks and laminae. Slightly irregular medium to thin parting in upper part to irregular thick parting in lower part; irregular and some coarse hackly fracture. Some light brownish-gray to buff mudstone streaks and stringer. Slightly unconformable contact with dark oil shale below.
83.6	84.0	Oil shale: Dark grayish brown, dolomitic. Faint very fine streaked bedding. Regular to irregular thick to medium parting; slightly conchoidal to irregular fracture. Sample of dark grayish-brown oil shale from 83.8 feet: X-ray--dolomite, quartz, feldspar, illite, pyrite.
84.0	84.8	Oil shale, marlstone, and mudstone: Rubble; like 77.0-84.0. Grab sampled.
84.8	85.3	Oil shale: Tan to medium and some dark grayish brown, slightly calcareous to dolomitic. Moderately distinct to very faint laminae. Regular thick to medium parting; slightly irregular fracture. A 1-1/2-inch white to dirty buff tuff with few small dark brownish-gray crystalline blebs at 85.0; abundant very fine biotite (and hornblende?) in lower part; slightly wavy upper contact. Fine vermiform sandy stringers in one inch below tuff.
85.3	85.7	Oil shale: Dark grayish brown, dolomitic. Faint laminae and streaked bedding. Irregular thick to thin parting; irregular coarse hackly fracture. Rare fine prismatic calcite streaks.

^{1/} By L. G. Trudell, completed May 7, 1975

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Laramie Energy Research Center, Laramie, Wyoming

June 10, 1975

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From	To	Description
85.7	86.5	Oil shale: Dark to medium grayish brown. Platy to papery rubble. Rare prismatic calcite streaks. Some pieces of grayish-brown earthy mudstone in contact with contorted oil shale and containing platy oil-shale inclusions. Grab sampled; length uncertain.
86.5	87.5	Oil shale: Dark grayish brown in upper part becoming slightly olive to almost neutral gray in lower part, calcareous. Faint slightly crinkled to regular very fine laminae. Slightly irregular to regular thick to rare thin parting; irregular to slightly conchoidal fracture. Very thin tan earthy lenses at 87.1.
87.5	88.8	Oil shale: Dark to some medium brownish gray. Mostly shaly to papery rubble. Dense light brownish-gray dolomite finely inter-laminated with oil shale in lower inch. Grab samples; length uncertain.
88.8	93.2	Rubble: Dark brownish-gray oil shale. Shaly to papery pieces. Some charred shale. Abundant dusty powder in upper part.
93.2	97.2	Oil shale: Dark olive gray and brownish gray to black, dolomitic. Very faint streaked bedding. Irregular to regular thick to some thin parting; irregular slight to coarse hackly fracture. Thin buff to olive-tan silty tuff stringers at 93.4; 1/2-to 3/4-inch gray silty tuff stringer at 93.7; thin to 1-inch tan silty tuff stringers at 96.0-96.2. (94.0-94.5 and 95.3-95.5 missing) Sample of black oil shale from 96.4 feet: X-ray-- quartz, dolomite, analcime, feldspar, illite, pyrite.
97.2	97.8	Tuff: Medium gray, silty. Massive to faintly mottled. Irregular parting and fracture. A 3/4-inch light brownish-gray dolomite band at base with tuff filling 1/2-inch break in band (fine stringer of tuff injected just below band?). Sharp slightly irregular contacts at top and bottom. Sample of gray silty tuff from 97.6 feet: X-ray-- quartz, feldspar, analcime, calcite, dolomite, pyrite.
97.8	99.7	Oil shale: Dark to medium and rare light slightly olive and brownish gray, calcareous. Faint to some moderately distinct laminae. Regular thick to rare thin parting; irregular to regular fracture. Irregular 2-inch gray silty tuff band at 98.7-98.9; fine gray silty tuff lens at 99.2.
99.7	100.7	Oil shale: Dark to some medium brownish gray; rare light brownish gray to buff near bottom, calcareous. Faint very fine laminae. Regular thick to medium parting; slightly irregular to some coarse hackly fracture. Few fine gray granular crystalline to silty calcareous laminae from 99.9 to 100.2.
100.7	102.0	Marlstone and some oil shale: Buff to medium and rare dark brownish to slightly olive gray, dolomitic. Distinct to faint thin to very fine laminae. Irregular thick to thin parting; regular to irregular fracture; some broken core and rubble. Some black oil-shale laminae with abundant fine buff lenses in upper part.
102.0	104.5	Missing

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From	To	Description
104.5	106.4	Oil shale and tuff: Black to medium gray and brownish-gray oil shale with 1/4-to 2-inch stringers of light gray to gray-buff silty tuff. Faint laminae in oil shale; some wavy and truncated. Irregular to regular thick to some thin parting; irregular to regular fracture. Sharp flat contact at bottom.
106.4	107.9	Tuff: Light to some medium gray, silty to very fine sandy textured. Massive; very fine oil-shale laminae at 107.5. Irregular thick parting; regular to irregular fracture; some rounded core ends.
107.9	110.3	Oil shale: Dark and rare medium brownish gray to some black, calcareous. Faintly laminated. Regular thick to rare thin parting; mostly chunky rubble. A 3/4-inch tight gray silty calcareous band at 108.?. Grab sampled; length uncertain.
110.3	113.5	Missing
113.5	114.0	Oil shale: Brownish black, dolomitic. Very faint streaked bedding. Regular thick to thin parting; slightly hackly fracture. Fine brown lamina with abundant ostracods at 113.7. Thin to fine light brownish-gray silty tuff stringer at 113.9. Thin dense tan dolomite band at bottom.
114.0	123.8	Siltstone and very fine sandstone: Light slightly olive and brownish gray, calcareous. Faintly streaked to massive; contorted bedding at 117.4-117.8. Irregular thick to rare medium and thin parting; slightly irregular to irregular fracture; slightly permeable; friable crumbly zone at 118.0-118.7 (some pale yellowish stains). Some irregularly laminated dark gray shaly mudstone near bottom. Very sharp regular contact with oil shale below. (122.5-123.5 missing?; most of core loss was probably around 118.5.)
123.8	128.4	Oil shale: Brownish black, dolomitic. Faint streaked bedding and rare very fine laminae. Regular to slightly irregular thick to medium and rare thin parting; irregular and some slight to rare coarse hackly fracture; iridescent purplish stains on some parting surfaces in upper part. Several fine dark gray silty tuff laminae and few thin brownish-gray blebby marlstone laminae at 124.3-124.5. Sample of brownish-black oil shale from 125.1 feet: X-ray--dolomite, quartz, analcime, feldspar, calcite, pyrite.
128.4	129.9	Oil shale: Black to dark and some medium almost neutral gray, silty, dolomitic. Faintly laminated; common distorted and displaced bedding in upper part. Regular to irregular thick to rare thin parting; irregular to slightly conchoidal fracture. Abundant brownish-gray and gray to dirty buff silty to sandy tuff streaks and laminae down to 129.5; large irregular nodule at 128.6-128.7. Sample of large tuff nodule from 128.6 feet: X-ray--K feldspar, analcime.

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From	To	Description
129.9	130.9	Oil shale: Dark olive gray to brownish black, dolomitic. Very faint streaked bedding. Slightly irregular to regular thick parting; slightly irregular to rare coarse hackly fracture. Few thin light to medium brownish-gray tuff streaks; some with biotite.
130.9	132.0	Oil shale: Brownish black, dolomitic. Very faint streaked bedding and some very fine laminae. Slightly irregular to regular thick to some thin parting; slightly irregular to coarse hackly fracture. Thin dark brownish-gray sandy-textured analcime (?) lamina at 131.7.
132.0	136.3	Oil shale: Dark to medium brownish gray, calcareous. Faint to fairly distinct very fine regular laminae. Regular thick to medium parting; slightly irregular fracture. Abundant very fine slightly prismatic crystalline calcite streaks. A thin brown-stained granular analcime lamina at 132.5. Gray silty tuff layers at 134.0 (1/4 inch), 134.3 (1 inch), 135.2 (1-1/4 inches) and at bottom (3-1/2 inches); fine gray granular lamina at 135.9. (133.1-133.5 missing) Sample of oil shale with abundant very fine crystalline streaks from 133.5 feet: X-ray--calcite, quartz, dolomite, analcime.
136.3	138.1	Oil shale: Dark to some medium brownish gray, calcareous. Faint to moderately distinct very fine regular laminae. Regular medium to very thin parting; slightly irregular and hackly fracture. Thin buff to orange-brown blebby (quartz?) laminae at 136.4. One-inch gray silty tuff bands at 137.3 and 137.7.
138.1	139.3	Oil shale: Brownish black, dolomitic. Very faint very fine laminae and streaked bedding. Regular thick to some thin parting; slightly irregular and hackly fracture. A thin dark gray silty tuff lamina at 138.4. Rare purplish-blue iridescent stains on parting surfaces.
139.3	141.5	Oil shale: Dark and rare medium brownish to slightly olive gray and some brownish black, dolomitic to calcareous. Faint and rare moderately distinct laminae and streaked bedding. Regular thick to very thin parting; slightly irregular and some slight to rare coarse hackly fracture. Two very thin tar-stained granular tuff laminae at 140.6. A 1/2-inch dense slightly blebby tan dolomite band at 140.8. Sharp slightly wavy contact with siltstone below.
141.5	142.5	Siltstone: Slightly brownish to neutral gray, calcareous. Massive to faint contorted bedding. Slightly irregular parting and fracture; rounded core pieces and rubble near bottom. A very thin wavy oil-shale stringer near top. Some fine black carbonaceous flecks.
142.5	143.5	Missing
143.5	146.2	Oil shale: Dark to medium brownish gray, calcareous. Faint to moderately distinct very fine regular laminae. Regular shaly to papery parting. Thick light gray silty tuff bands at 143.6-143.8 and 144.9-145.25; fairly abundant thin to fine laminae elsewhere.

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From	To	Description
146.2	147.0	Oil shale: Dark brownish gray to brownish black, calcareous, becoming dolomitic in lower 0.2 foot. Faint streaked bedding and very fine laminae; abundant very fine distinct buff to white streaks in some parts. Regular very thin to thick parting. Thin buff silty biotitic tuff band at 146.7. Sample of oil shale with very fine buff to white streaks from 146.6 feet: X-ray--calcite, quartz, dolomite, analcime.
147.0	147.9	Oil shale: Dark to medium olive gray, dolomitic. Very faint streaked bedding. Irregular to regular medium to thin parting; coarse hackly to regular fracture. Sample of dark olive-gray oil shale from 147.2 feet: X-ray--dolomite, quartz, analcime, feldspar, illite, montmorillonite.
147.9	155.4	Marlstone: Light to medium neutral gray to olive green, dolomitic to slightly calcareous, slightly silty. Faint laminae and some bands. Regular to irregular thick to rare thin parting; regular to irregular and slightly conchoidal fracture. (154.7-154.9 missing.)
155.4	158.2	Marlstone: Light to medium olive green and olive gray, slightly calcareous to dolomitic. Moderately distinct to faint laminae and some bands. Regular thick to rare thin parting; regular to slightly conchoidal fracture. A 1-inch light gray silty biotitic tuff band at 155.8-155.9 and a thin very biotitic band at 155.95-156.0; a 1/4-inch dark gray biotitic lamina at 157.0.
158.2	162.9	Mudstone and marlstone: Light greenish gray, slightly calcareous. Massive to very faintly banded and laminated. Irregular to some regular thick to medium parting; regular to conchoidal fracture. Some gray-buff silty laminae near base. Sample of light greenish-gray mudstone from 161.3 feet: X-ray--dolomite, quartz, analcime, feldspar, calcite.
162.9	163.9	Oil shale: Light olive green to medium olive gray, slightly calcareous to dolomitic. Faint streaked bedding and some laminae. Irregular to fairly regular thick parting; fairly regular to irregular fracture. Few fine gray-buff silty biotitic laminae and streaks in upper part. Rare fine pyrite disks.
163.9	164.2	Missing
164.2	166.2	Oil shale: Light to medium olive gray, dolomitic. Very faint laminae, bands, and streaked bedding. Slightly irregular thick to medium parting; slightly conchoidal to irregular fracture. Sample of olive-gray oil shale from 165.8 feet: X-ray--dolomite, quartz, calcite, analcime, feldspar.
166.2	167.2	Oil shale: Olive gray to brownish gray, some dark brownish-gray to black laminae and streaks in lower part, dolomitic. Very faintly laminated; some irregular streaks in lower part. Irregular thick parting; irregular fracture.

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From	To	Description
167.2	168.7	Oil shale: Dark and some medium brownish and olive gray to black, dolomitic to calcareous. Faint to moderately distinct streaks and slightly irregular laminae. Slightly irregular thick to some thin parting; irregular slight to rare coarse hackly fracture. Thin dense gray slightly silty bands at 167.9 and 168.0. Small irregular lens composed of fine contorted and broken dense brown dolomite ribbons near base. Sharp regular contact with claystone below.
168.7	173.5	Claystone: Light to some dark gray, dolomitic, silty in upper part. Faint to rare moderately distinct laminae and streaked bedding. Irregular to some regular thick to rare thin parting; slightly irregular fracture. Broken core at 169.8-171.2; artificial (?) vertical fractures in other parts. Rare fine gray to black chert (?) pebbles in upper part. Sample of gray claystone from 173.3 feet: X-ray--quartz, dolomite, analcime, feldspar, pyrite.
173.5	174.3	Claystone and mudstone: Gray to gray buff, slightly calcareous. Fairly distinct laminae (interrupted by thin vertical mudstone stringers in lower part). Regular thick parting; slightly irregular fracture.
174.3	174.9	Rubble: As above and below.
174.9	175.8	Claystone: Medium to dark gray, some light yellowish gray in upper part, rare black streaks, dolomitic. Faint streaked bedding. Regular to irregular thick parting; slightly conchoidal to irregular fracture. Grades into oil shale below.
175.8	177.0	Oil shale: Dark and some medium slightly brownish gray to black, dolomitic, becoming very calcareous near base. Moderately distinct to faint streaked bedding, becoming very finely laminated near bottom. Slightly irregular thick parting in most parts to regular thin parting in lower 3 inches; slightly irregular to slight and rare sharp hackly fracture. Abundant ostracods on some parting surfaces in lower part. Very sharp regular contact with marlstone below.
177.0	178.5	Marlstone (partly oil shale): Buff white to tan and rare brownish gray, dolomitic to slightly calcareous. Faint to rare distinct laminae and some very faintly bedded bands (rarely disrupted and displaced). Irregular to regular thick to thin parting; irregular and some hackly to slightly conchoidal fracture. Few small chalcedony lenses 177.1. Large unidentified black fossil (?) at 177.2 (removed). Sample of buff to tan marlstone from 178.1 feet: X-ray--quartz, dolomite.
178.5	179.6	Oil shale: Dark to medium olive gray and brownish gray, calcareous. Faint to moderately distinct very fine laminae. Regular thick to some very thin parting; regular to slightly hackly fracture. Abundant very fine buff to light gray and brownish-gray streaks. Very abundant ostracods in upper part. A fine gray silty biotitic tuff lamina at 179.5. Sample of oil shale from 179.1 feet: X-ray--calcite, dolomite, quartz, analcime, feldspar, pyrite.

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From	To	Description
179.6	180.7	Oil shale: Dark to medium brownish gray and some brown, becoming almost neutral gray, calcareous, Faint to fairly distinct very fine laminae. Regular thick to very thin parting; slightly hackly to regular fracture. Some ostracods. A very fine gray biotitic tuff lamina at 180.5. Finely interlaminated yellow-tan lenticular marlstone laminae and very fine black oil-shale laminae in lower inch.
180.7	182.3	Oil shale: Dark to some light brownish gray, some olive gray in upper 0.4 foot; dolomitic in upper 0.4 foot, calcareous in other parts. Faint to some distinct very fine to thin laminae. Regular thick to some medium parting; irregular to regular fracture. Rare ostracods. Long thin blade-like plant fossil at 182.05. A thin dark gray to light brownish-gray silty biotitic tuff at 181.2; a 1-inch gray to brownish-gray granular biotitic band at 181.4-181.5.
182.3	183.7	Oil shale: Dark brownish gray, calcareous. Faint very fine laminae. Regular thick to rare medium and thin parting; slightly irregular to regular fracture. Very rare ostracods. Two fine tuff laminae at top; a 1-3/4-inch light brownish-gray to medium gray silty biotitic tuff band at 183.3.
183.7	184.4	Marlstone: Light brownish gray and some buff to medium and rare dark almost neutral gray, calcareous, becoming slightly silty in lower part. Faint laminae and bands. Regular to irregular thick parting; irregular to slightly irregular and conchoidal fracture; some worn core ends and rubble in lower part. Some fine to very small white to light gray chert streaks, blebs, and lenses in lower part.
184.4	185.0	Missing.
185.0	185.4	Mudstone: Light to medium and rare dark slightly olive gray, dolomitic. Faintly banded to laminated. Irregular parting and fracture. Very abundant fine and rare small buff silty and earthy blebs below 185.15.
185.4	185.55	Oil shale and marlstone: Black oil shale with a 1/4- to 1-inch buff earthy and silty marlstone stringer.
185.55	185.65	Marlstone: Buff, calcareous, earthy to dense, some porous streaks. Very faint wavy and broken bedding. Irregular 1/2- to 1-inch layer.
185.65	185.9	Mudstone: Medium to light olive gray, dolomitic. Faint streaked bedding. Abundant very fine buff specks in upper part.
185.9	186.0	Oil shale: Black to some medium slightly brownish gray, dolomitic. Faint slightly wavy laminae. Some very fine yellow-tan specks.
186.0	186.35	Marlstone: Light to rare medium and dark gray, slightly calcareous. Faint to rare distinct regular laminae. Regular thin to thick parting; regular fracture. A fine gray silty biotitic tuff lamina at 186.05.
		Sample of light to rare dark gray marlstone from 186.2 feet: X-ray--dolomite, quartz, analcime, feldspar.

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From	To	Description
186.35	186.9	Oil shale: Very dark to medium and rare light gray, calcareous. Faint to moderately distinct laminae; locally distorted adjacent to a fine high angle buff limestone stringer. Regular thick and rare thin parting; regular fracture. Two fine tan-buff earthy lenses at 186.6. Two fine gray blebby to slightly sparry tuff laminae near base.
186.9	187.9	Oil shale: Dark and rare medium almost neutral gray to dark grayish brown, calcareous. Faint to moderately distinct very fine laminae and streaks. Regular thick to some thin parting; slightly irregular fracture. Sample of dark grayish-brown oil shale from 187.8 feet: X-ray--calcite, quartz, dolomite, analcime, pyrite, illite.
187.9	189.0	Oil shale: Medium and some dark to rare light grayish brown to almost neutral gray, calcareous. Moderately distinct to faint laminae. Regular thick to papery parting; regular fracture. A 1-1/2-inch light to medium gray very fine sandy-textured biotitic tuff near top; a very thin brownish-gray sandy tuff at 188.5.
189.0	191.0	Oil shale: Dark to some medium brownish to slightly olive gray, calcareous. Faintly laminated. Regular thick to papery parting; hackly fracture. Sample of very dark papery oil shale from 190.1 feet: X-ray--calcite, quartz, analcime, feldspar, pyrite, dolomite.
191.0	192.0	Oil shale: Dark to medium brownish gray, calcareous. Faintly laminated. Regular thick parting; slightly irregular fracture. A 7/8-inch tan to buff marlstone band with few <u>very</u> fine oil-shale laminae at 191.3; few fine tan marlstone laminae at 191.5-191.6. Rare fine sandy tuff laminae.
192.0	193.0	Oil shale: Black to some medium brownish gray, calcareous. Faintly laminated. Regular thick to thin parting; regular to coarse hackly fracture. Rare brownish-gray to dark gray tuff laminae. A 0.1-foot distinctly laminated light gray and yellowish-tan to dark brownish-gray zone near base.
193.0	194.3	Oil shale: Dark to rare light brownish to almost neutral gray, calcareous. Faint to rare distinct laminae. Regular to some irregular thick to thin parting; regular to some hackly fracture.
194.3	195.0	Missing.
195.0	197.8	Oil shale: Dark to some medium brownish to slightly olive gray, some dark grayish brown in upper part, calcareous. Faintly laminated. Regular thick to some papery parting; regular to some slightly hackly fracture. A fine dark silty lamina at 195.8; a 1/4-inch medium gray lamina at 196.3. Tan marlstone very finely laminated with black oil shale at 197.6-197.7. Sample of dark brownish-gray oil shale from 197.2 feet: X-ray--calcite, quartz, dolomite, feldspar, analcime, pyrite.

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From	To	Description
197.8	198.8	Oil shale: Dark brownish gray to black; rare medium grayish brown near bottom, dolomitic. Faint laminae to very faint streaked bedding. Regular to some irregular thick to thin parting; regular to irregular and slightly hackly fracture. A fine slightly brownish-gray silty lamina at 197.9. Sample of black oil shale from 198.6 feet: X-ray--calcite, quartz, dolomite, analcime, feldspar, pyrite.
198.8	199.6	Oil shale: Buff to black, some light gray in lower part, calcareous. Distinct to some faint laminae. Regular thick to medium parting; regular to some irregular fracture. Sample of distinctly laminated buff to black oil shale from 199.3 feet: X-ray--dolomite, calcite, feldspar, quartz, pyrite.
199.6	200.5	Oil shale: Medium to some dark brownish and olive gray, moderately to slightly calcareous. Faintly laminated. Slightly irregular thick to thin parting; irregular and some coarse hackly fracture.
200.5	201.4	Oil shale: Dark and some medium brownish gray to rare black, calcareous. Faintly laminated. Regular thick to rare medium and thin parting; slightly irregular fracture. A thin slightly brownish-gray silty tuff lamina at 201.3.
201.4	202.3	Oil shale: Medium to some light and dark brownish gray, calcareous. Faint to moderately distinct laminae. Regular thick parting; fairly regular fracture. Some ostracods. Rare fish scales; part of a small fish at 201.7. Few very thin to fine gray silty tuff laminae.
202.3	203.1	Oil shale: Dark brownish gray to black, dolomitic. Faint very fine laminae and streaked bedding. Irregular to some regular thick to some thin parting; irregular fracture. A 2-inch gray-buff to light gray silty tuff band at 202.6-202.8; biotite becoming very abundant near bottom.
203.1	203.7	Oil shale: Olive gray, dolomitic. Faintly laminated. Slightly irregular thick parting; irregular fracture. A 3/4-inch light to medium gray very biotitic tuff band at 203.2. Sample of olive-gray oil shale from 203.6 feet: X-ray--dolomite, quartz, calcite, analcime, feldspar, pyrite, illite, montmorillonite.
203.7	206.7	Oil shale: Olive gray to greenish gray, slightly calcareous. Faintly laminated. Irregular to slightly irregular thick parting; irregular fracture. (204.7-205.0 missing)
206.7	207.2	Oil shale: Medium and some dark grayish brown, rare black, dolomitic to slightly calcareous. Faint laminae to very faint streaked bedding. Irregular thick parting; irregular fracture. Rare very fine biotite flakes.

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From	To	Description
207.2	208.1	Oil shale: Dark brownish gray to buff, very calcareous. Faint to distinct very fine laminae. Regular papery to some thick parting; hackly to regular fracture. Sharp slightly wavy contact with limestone below. Sample of dark brownish-gray to buff oil shale from 207.9 feet: X-ray--calcite, dolomite, quartz, feldspar, analcime, pyrite. BOTTOM OF LANEY MEMBER TOP OF WILKINS PEAK MEMBER
208.1	208.7	Marlstone: Buff to some brownish gray, calcareous. Faint streaked bedding. Slightly irregular thick to medium parting; slightly conchoidal to irregular fracture. Abundant fine to 3/4-inch buff-white limestone layers and streaks in upper 0.2 foot. Sample of buff-white limestone band from 208.3 feet: X-ray--calcite, dolomite, quartz, feldspar, analcime.
208.7	209.2	Claystone: Light gray green, calcareous. Crumbly core riddled with desiccation cracks; uneven sample split.
209.2	210.4	Mudstone: Light to medium slightly greenish gray, slightly dolomitic. Very faintly bedded; some fine white to gray-buff silty limestone laminae. Regular to irregular thick to thin parting; irregular coarse hackly fracture. Crumbly flakey olive-brown claystone at 209.9-210.0. Mudstone and limestone rubble in lower 0.4 foot.
210.4	211.7	Siltstone: Light gray to nearly white, slightly calcareous. Very faintly bedded. Fairly regular to irregular thick to rare thin parting; regular to irregular fracture. Sample of white siltstone from 210.8 feet: X-ray--analcime, quartz, calcite, feldspar, pyrite.
211.7	212.5	Siltstone and mudstone: Buff to light olive gray, very calcareous. Regular to irregular very thin to medium parting; irregular hackly fracture. Some interlaminated olive-green oil shale in lower part.
212.5	212.8	Oil shale: Medium to light olive green and olive gray dolomitic. Faint streaked bedding and some very fine laminae. Irregular parting; slightly hackly fracture. Some very fine white silty calcareous streaks in upper part. Sample of olive-green oil shale from 212.7 feet: X-ray--dolomite, quartz, calcite, illite, montmorillonite, analcime, feldspar.
212.8	213.6	Oil shale: Medium and some light to very dark olive gray, dolomitic. Distinct streaks and discontinuous laminae. Irregular thick parting; irregular and slightly hackly fracture. A very thin light brownish-gray silty tuff lamina near top.
213.6	213.8	Tuff: Gray white, silty, slightly calcareous. Massive; sharp wavy contact at top; interfingered with fine dark olive-gray oil shale stringers in lower part.

Illustration No. SBR-4715P Sheet 10 of 12.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAYS

Core samples from the Laramie Energy Research Center's White Mountain Corehole No. 3

From	To	Description
213.8	214.8	Oil shale: Medium to light olive green, dark olive gray in upper inch, dolomitic to slightly calcareous. Faint to fairly distinct streaks and discontinuous laminae. Irregular thick parting; irregular and some conchoidal fracture. A fine tan-buff marlstone layer between dark and medium oil shale at 213.9.
214.8	215.6	Limestone: Buff, silty textured. Few oil-shale laminae and very fine streaks.
215.6	217.0	Marlstone, limestone and lean oil shale: Light to some medium greenish gray to olive gray, calcareous. Faint to moderately distinct laminae and bands. Irregular to regular thick to some medium and thin parting; fairly regular to irregular and rare coarse hackly fracture. A 3/4-inch white biotitic tuff band at top; common light slightly greenish-gray silty biotitic streaks in upper half. Fine disseminated pyritic calcite blebs becoming abundant in lower part.
217.0	217.6	Oil shale: Medium to dark olive gray, dolomitic. Faint to fairly distinct streaked bedding. Irregular thick parting; irregular to slightly conchoidal fracture. Abundant blebby white calcite patches and streaks.
217.6	219.1	Marlstone and mudstone: Light to some medium slightly olive and brownish gray, slightly to very calcareous. Faint to some moderately distinct laminae and bands. Fairly regular thick parting; regular to slightly irregular fracture. Buff to gray-buff silty limestone in upper 0.3 foot.
219.1	220.1	Mudstone, siltstone, and sandstone: Light slightly olive and brownish gray, very calcareous. Faint irregular layers; some fine marlstone and oil-shale stringers. Irregular thick to thin parting; irregular fracture. Sample of very calcareous sandstone (or sandy limestone) from 219.9 feet: X-ray--calcite, dolomite, quartz, feldspar.
220.1	221.1	Oil shale: Greenish gray to olive gray, dolomitic. Very faint streaked bedding. Fairly regular to irregular thick parting; slightly irregular to some hackly fracture. Abundant fine to moderately coarse calcite blebs.
221.1	223.5	Marlstone: Light to some medium olive green, moderately to slightly calcareous. Faint laminated; some streaked bedding near top. Light gray silty to very fine sandy-textured limestone in upper 0.1 foot. Rare fine light gray to white tuff streaks.
223.5	225.0	Oil shale: Medium to some light and dark olive green to greenish gray, dolomitic. Faintly laminated; some very faint streaked bedding in lower part. Regular to irregular thick to medium parting; slightly irregular to rare coarse hackly fracture. A very irregular thin medium gray silty tuff stringer at 224.1.
225.0	226.0	Oil shale: Medium to rare dark olive green, dolomitic. Faint to moderately distinct streaked bedding. Fairly regular to irregular thick parting; irregular fracture. A very fine brittle black organic seam at 225.5.

Illustration No. SBR-4715P Sheet 11 of 12.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAYS

Core samples from the Laramie Energy Research Center's White Mountain Corehole No. 3

From	To	Description
226.0	228.7	Marlstone (partly oil shale) and limestone: Medium to light slightly olive-gray marlstone with streaks, laminae, bands, and blebs, of buff to nearly white silty limestone. Irregular to some regular thick to rare medium and thin parting; irregular to regular fracture. Sample of olive-gray oil shale from 228.6 feet: X-ray--dolomite, quartz, calcite, feldspar, illite, montmorillonite.
	228.7	Bottom of recovered core
	230.0	Bottom of hole

Illustration No. SBR-4715P Sheet 12 of 12.

Laramie Energy Research Center, Laramie, Wyoming

June 10, 1975