

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

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A drilled
in 1974 in NE1/4SE1/4NE1/4 (1,775.6 FNL, 407.3 FEL) of sec 24,
T 22 N, R 109 W, Sweetwater County, Wyoming

Surface elevation: 6,298.9 feet
Described interval: 545.0 to 896.8 feet

| From | To | Description |
|---------------------------------------|-------|---|
| LANEY MEMBER OF GREEN RIVER FORMATION | | |
| 545.0 | 548.6 | Shaly mudstone (oil shale?): Medium and dark gray in upper part to medium and light gray in lower part, some olive gray in middle, slightly calcareous. Faint to some moderately distinct laminae. Irregular to regular thick to some thin parting; irregular to regular and some coarse hackly fracture. Some ostracods in upper part becoming abundant in lower part. Small fish at 546.0 and 548.1. Very fine black brittle striated organic streak at base. Sample of dark gray shaly mudstone from 546.5 feet: X-ray--quartz, feldspar, calcite, analcime, dolomite, illite, montmorillonite. |
| 548.6 | 552.6 | Siltstone and mudstone: Medium and some light olive gray to slightly brownish gray, slightly calcareous. Massive with some very faint streaks and rare laminae. Irregular and rare regular thick to some medium parting; fairly regular to irregular fracture. Abundant very fine biotite and muscovite. |
| 552.6 | 554.2 | Mudstone: Olive gray, very slightly calcareous, massive. Irregular thick to medium parting; irregular slight to some coarse hackly fracture. Abundant very fine biotite and muscovite. Sample of olive-gray mudstone from 553.5 feet: X-ray--quartz, Na and K feldspars, montmorillonite, illite, calcite, dolomite. |
| 554.2 | 558.1 | Sandstone: Medium olive gray to rare light olive gray and buff, silty, to fine grained. Massive; some faint and rare distinct variegations. Regular to irregular thick parting; regular fracture; slightly permeable. Some muscovite and biotite. Sample of olive-gray sandstone from 557.2 feet: X-ray--Na feldspar, quartz, montmorillonite, illite. |
| 558.1 | 559.0 | NOTE: Core sequence from 558.1 to 567.1 appears to be incorrect. Siltstone and very fine sandstone: Light gray to gray buff, some olive gray in lower part, slightly calcareous. Faintly streaked and laminated in upper part; becoming variegated and mottled in lower part. Slightly wavy to irregular thick parting; fairly regular to irregular fracture. Some fine black carbonaceous streaks in upper part. |
| 559.0 | 560.0 | Limestone: Buff, dolomitic. Faint broken and displaced laminae; some thin to fine shredded olive-gray marlstone streaks and stringers in lower part. Irregular parting and fracture. Some granular porous stringers and patches (fracture fillings?). |
| 560.0 | 562.0 | Mudstone and siltstone: Medium to some light olive gray, slightly calcareous to dolomitic. Faint laminae, bands, and streaked bedding. Irregular to fairly regular thick parting; irregular fracture. A thin black coaly layer at 561.4. |

^{1/} By L. G. Trudell, completed June 10, 1975

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|---|
| 562.0 | 563.3 | Sandstone and mudstone: Olive gray, almost brownish gray near bottom, very fine grained, slightly calcareous. Massive to faintly streaked and layered. Irregular thick parting; slightly irregular to irregular fracture. Some muscovite and biotite. Rare carbonaceous streaks. |
| 563.3 | 564.5 | Mudstone and shale: Olive gray. Very faint streaked bedding. Irregular thick to rare thin parting; irregular to coarse hackly fracture. Light brownish-gray to gray-buff siltstone at 563.6-563.8. Sample of olive-gray shale from 564.2 feet: X-ray--quartz, feldspar, illite, montmorillonite, calcite, analcime, dolomite. |
| 564.5 | 564.8 | Sandstone and siltstone: Gray buff to olive gray, variegated. Few black carbonaceous specks. (Lower core end fits core at 556.4.) |
| 564.8 | 565.3 | Sandstone: Olive gray, fine grained. Faint very fine regular laminae and streaks. Slightly irregular thick parting; regular fracture. |
| 565.3 | 565.5 | Sandstone: Very light gray to some light and medium brownish gray, fine grained. Massive; faint very fine curved to flat laminae and streaks in lower 3/4 inch. |
| 565.5 | 565.8 | Mudstone: Olive gray, very slightly calcareous. Very faint streaked bedding. |
| 565.8 | 566.3 | Limestone: Buff, dolomitic. Very faintly bedded. Irregular thick parting; irregular to slightly conchoidal fracture. Some slightly open to drusy crystal-filled vertical fractures. Sample of buff dolomitic limestone from 566.0 feet: X-ray--dolomite; some quartz, analcime, feldspar, calcite, illite. |
| 566.3 | 567.1 | Mudstone and claystone: Light to medium slightly olive gray, very slightly calcareous. Massive to very faint streaked bedding. Mostly chunky to platy rubble. |
| 567.1 | 568.0 | Missing. |
| 568.0 | 570.0 | Shale: Olive gray to slightly greenish gray becoming almost neutral in lower part, slightly to moderately calcareous. Very faint very fine laminae. Irregular to regular shaly parting; irregular coarse hackly fracture. Sample of gray shale from 569.9 feet: X-ray--quartz, aragonite, feldspar, illite, montmorillonite, dolomite, calcite. |
| 570.0 | 572.5 | Shale: As above and below. Discontinuous core and rubble; grab sampled. |
| 572.5 | 574.8 | Claystone: Olive gray. Crumbly core riddled with desiccation cracks; falls apart on splitting. Few fine prismatic calcite streaks. Fairly continuous core; uneven sample split. Sample of crumbly desiccated claystone from 573.5 feet: X-ray--quartz, calcite, Mg-calcite, illite, analcime, feldspar, pyrite, dolomite, montmorillonite. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|---|
| 574.8 | 578.5 | Oil shale: Medium olive gray and rare brownish gray, calcareous. Faint very fine laminae with some very fine distinct tan to buff earthy laminae and streaks. Regular thick to thin parting; slightly irregular to hackly fracture; some crumbly desiccated shale in upper part. Sample of olive-gray oil shale from 577.3 feet: X-ray--quartz, Mg-calcite, analcime, feldspar, illite, pyrite, montmorillonite. |
| 578.5 | 580.0 | Oil shale: Medium to very dark brownish gray, calcareous. Finely laminated, with distinct buff earthy laminae and streaks becoming abundant in lower part. Regular shaly to papery parting; hackly fracture. A 2-inch light gray silty tuff with abundant very fine biotite at 579.6; interfingered with oil shale at bottom. Sparse ostracods. Sample of dark brownish-gray oil shale with very fine buff laminae from 579.8 feet: X-ray--quartz, aragonite, analcime, feldspar, illite, calcite, pyrite, dolomite, montmorillonite. |
| 580.0 | 584.9 | Oil shale: Medium to some dark olive gray and brownish gray, calcareous, commonly earthy. Mostly crumbly papery shale with desiccation cracks; falls apart on splitting. Abundant very fine buff laminae and streaks. |
| 584.9 | 585.3 | Missing. |
| 585.3 | 586.9 | Oil shale: Dark brownish gray to buff, calcareous to dolomitic. Faint to distinct laminae. Regular to irregular very thin to thick parting; hackly to slightly irregular and conchoidal fracture. Abundant ostracods in upper part. A 2-inch very faintly laminated buff marlstone band at base. Sample of buff marlstone from 586.8 feet: X-ray--dolomite; some quartz, analcime. |
| 586.9 | 595.0 | Oil shale: Very dark to some medium slightly brownish gray, slightly to moderately calcareous. Faint very fine laminae; abundant very fine distinct buff earthy laminae and streaks in upper part becoming sparse in lower part. Regular to some irregular thin to thick parting; slight to rare coarse hackly fracture. Some ostracods. Occasional fine gray silty laminae in lower part. Light brownish-gray to buff marlstone with some oil-shale laminae at 591.0-591.3, 593.1-593.5, and 594.3-594.6. Sample of very dark slightly brownish gray oil shale from 591.0 feet: X-ray--quartz, analcime, feldspar, illite, dolomite, calcite, pyrite. |
| 595.0 | 596.0 | Oil shale: Dark to medium olive gray, slightly to moderately calcareous. Faintly laminated. Regular to some irregular medium to rare thick and thin parting; slightly hackly fracture. Rare fine medium to dark gray laminae and streaks. Sparse ostracods. Tan-buff marlstone at 595.2-595.3. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines, Wyoming Corehole 9A

| From | To | Description |
|-------|-------|---|
| 596.0 | 598.6 | Oil shale: Medium to dark olive gray and brownish gray, some tan to buff marlstone at 596.0-596.1, 596.3-596.5, 597.2-597.3, and 598.2-598.6; dolomitic to calcareous. Faint to some distinct laminae. Fairly regular thick to some thin parting; slightly hackly to regular fracture. Sparse to fairly abundant ostracods. A 2-inch very dark brownish-gray silty tuff at 597.9; regular flat upper contact; fine oil-shale lamina in middle; very irregular hackly contact at base. Sample of very dark brownish-gray silty tuff from 597.9 feet: X-ray--quartz, analcime, feldspar, illite, pyrite, dolomite. |
| 598.6 | 599.6 | Oil shale: Very dark to medium and rare light slightly brownish and olive gray, calcareous. Faint to some moderately distinct laminae; some <u>very</u> fine distinct buff laminae and streaks in darker parts. Regular thick to thin parting; slightly hackly fracture. Sparse ostracods. Few very fine gray and light brownish-gray tuff laminae. |
| 599.6 | 600.8 | Oil shale: Medium to dark and rare light brownish gray to buff, calcareous. Faint and rare distinct laminae. Regular thick to some thin parting; slightly hackly fracture. Some ostracod-covered parting surfaces. A 2-inch dark brownish-gray silty tuff at 600.0-600.2. |
| 600.8 | 602.7 | Oil shale: Dark to medium brownish gray. Faintly laminated. Papery parting and hackly fracture in upper part; regular to irregular medium to thick parting and irregular fracture in lower part. A very thin light gray biotitic tuff lamina at 601.7. Some thin to 1-inch medium brownish-gray silty tuff stringers and lenses in lower part. Some very fine buff earthy laminae. Rare ostracod-covered parting surfaces. |
| 602.7 | 604.3 | Oil shale: Dark slightly brownish gray, slightly to moderately calcareous, silty. Faintly laminated. Regular thick to thin parting; slightly hackly to regular fracture. Sparse ostracods. Buff earthy and slightly silty marlstone at 603.4-603.7. Sample of dark slightly brownish gray oil shale from 603.1 feet: X-ray--quartz, aragonite, analcime, illite, feldspar, dolomite, calcite, pyrite. |
| 604.3 | 605.5 | Oil shale: Medium to dark brownish gray, some tan to buff in upper part, dolomitic to calcareous. Faintly laminated. Regular thick to rare thin parting; regular to slightly hackly fracture. Fine gray silty tuff lamina at 605.4. Sample of medium to light brownish-gray oil shale from 604.8 feet: X-ray--dolomite, quartz, analcime, feldspar, illite. |
| 605.5 | 606.5 | Oil shale: Dark to medium brownish gray, calcareous. Faint very fine laminae; abundant very fine distinct buff earthy laminae and streaks. Regular very thin to rare thick parting; slightly hackly fracture. A thin very dark slightly brownish gray silty tuff layer at 605.9. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|---|
| 606.5 | 606.8 | Tuff and oil shale: Irregular streaks, lenses, and layers of slightly brownish gray silty tuff interbedded, interfingered, and streaked with oil shale as above. Sample of tuff with some very fine oil-shale streaks from 606.8 feet: X-ray--quartz, analcime, calcite, feldspar, illite, pyrite, dolomite. |
| 606.8 | 608.0 | Oil shale: Medium to some dark brownish to slightly olive gray, calcareous. Faint very fine laminae; abundant very fine buff streaks and laminae in some parts. Regular shaly to papery parting (some slightly curved); hackly fracture. Rare ripple marks. Brownish-gray tuff as above at 607.4-607.5. A 1/8-inch granular gray-buff biotitic tuff at 607.9. |
| 608.0 | 609.3 | Oil shale: Very dark to some medium brownish gray, calcareous. Faintly laminated; some very fine distinct buff laminae in upper part. Regular to curved and inclined thick to thin parting; hackly to slightly irregular fracture. Large brownish-gray tuff lenses in distorted oil shale at 608.2 and 609.1. |
| 609.3 | 610.4 | Oil shale: Dark to some light brownish gray, calcareous. Faintly laminated, with abundant very fine distinct buff earthy laminae and streaks. Papery to shaly parting; hackly fracture. Thin gray silty tuff lamina at 610.0. |
| 610.4 | 613.0 | Oil shale: Dark brownish gray to black, slightly calcareous to dolomitic. Very faint laminae and streaked bedding. Regular to some irregular thin to thick parting; slightly hackly to some irregular fracture. Tight dark brownish-gray slightly silty tuff in lower 2 inches. Rare ostracods (?) in lower part. Sample of black oil shale from 612.5 feet: X-ray--quartz, dolomite, feldspar, illite, pyrite. |
| 613.0 | 613.6 | Oil shale: Tan and light yellowish gray to medium grayish brown and some dark brownish gray, calcareous. Faint to distinct very fine slightly crinkly laminae. Regular thick to very thin parting; regular to slightly hackly fracture. A very fine vitreous black brittle organic streak (woody plant fossil?) near top. Sample of tan to dark brownish-gray oil shale from 613.5 feet: X-ray--dolomite, calcite, feldspar, analcime, quartz. |
| 613.6 | 614.4 | Oil shale: Brownish black to dark and rare medium grayish brown, calcareous. Faint laminae and streaked bedding; some very fine distinct buff to brown laminae and streaks. Regular thick to rare thin parting; regular to slightly irregular and hackly fracture. Fine gray silty tuff lamina at 614.0; a very fine dark gray pyritic lamina at 614.2. Very indistinct large tight dark brownish-gray slightly silty lens braided with very fine oil-shale streaks at 614.3. |
| 614.4 | 614.9 | Tuff: Brownish gray, silty, massive. Few very fine dark oil-shale streaks at top; sharp regular contact with oil shale below. Sample of brownish-gray tuff from 614.7 feet: X-ray--quartz, analcime, feldspar, pyrite, illite. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|--|
| 614.9 | 615.8 | Oil shale: Dark to medium and rare light brownish gray, calcareous. Faint to rare distinct very fine laminae. Regular thick to medium parting; regular fracture. A thin light gray silty tuff lamina at 615.05; a thin medium gray lamina at 615.3; and a thin pinched out tan to buff granular to sparry biotitic tuff lamina at 615.6. Abundant <u>very</u> fine crystalline streaks in some zones. Sample of dark to medium brownish-gray oil shale with very fine crystalline streaks from 615.4 feet: X-ray--calcite, some dolomite, quartz, analcime, pyrite. |
| 615.8 | 616.9 | Oil shale: Black to some medium brownish gray and grayish brown, dolomitic. Faint laminae and streaked bedding. Fairly regular to irregular thick parting; irregular fracture. An irregular 1-1/2-inch dark to medium dirty gray silty to very fine sandy-textured biotitic tuff at 616.0 and a 1-inch black to brownish-gray biotitic tuff at 616.4. BOTTOM OF LANEY MEMBER TOP OF WILKINS PEAK MEMBER |
| 616.9 | 619.3 | Oil shale: Medium and rare dark olive to olive gray, dolomitic. Faint laminae and streaked bedding. Irregular thick parting; irregular fracture. Rare fine to coarse pale yellow-white crystalline calcite streaks. Sample of medium to dark olive-gray oil shale from 617.4 feet: X-ray--dolomite, quartz, feldspar, aragonite, calcite, illite, pyrite. |
| 619.3 | 621.4 | Oil shale: Medium to very dark brownish gray and rare black, calcareous. Faint to moderately distinct laminae. Regular and rare irregular thick to some thin parting; slightly conchoidal to slightly irregular and hackly fracture. Part of a small fish at 619.8. Very sharp regular contact with marlstone below. Sample of very dark brownish-gray oil shale from 619.7 feet: X-ray--calcite; some quartz, dolomite, feldspar. |
| 621.4 | 622.5 | Marlstone: Tan and grayish brown to buff in upper part becoming light to some medium olive gray in lower part, dolomitic, becoming slightly silty in lower part. Faint to some distinct bands and laminae. Irregular to regular thick to some thin parting; regular to slightly irregular and some conchoidal fracture. Some thin buff silty limestone laminae in lower part. |
| 622.5 | 623.3 | Mudstone: Olive buff to some medium and rare dark olive gray. Fairly distinct bands and laminae. Irregular to regular thick to thin parting; irregular to slightly conchoidal fracture. |
| 623.3 | 623.8 | Mudstone: Slightly brownish gray, slightly calcareous. Massive to very faintly streaked. Irregular parting and fracture. Some fine to small white to buff calcareous streaks, patches, and blebs. Irregular upper contact; slightly wavy lower contact. Sample of gray mudstone with few fine buff blebs from 623.5 feet: X-ray--quartz, dolomite, feldspar, calcite, illite. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|--|
| 623.8 | 625.6 | Limestone: Light brownish gray and tan to buff and gray buff, calcareous to dolomitic, commonly silty to sandy. Faint streaked bedding and rare laminae; becoming fractured and displaced to coarsely brecciated in lower part. Irregular thick parting; irregular fracture; porous in lower part. Some biotite in upper part. Sample of porous limestone breccia from 625.4 feet: X-ray--quartz, analcime, feldspar, pyrite. |
| 625.6 | 627.9 | Oil shale: Dark brownish gray and olive gray to some black, dolomitic. Faint streaked bedding. Irregular to fairly regular thick parting; irregular fracture. |
| 627.9 | 628.1 | Dolomite: Grayish brown to buff earthy. Faint distorted streaked bedding. Sample of tan to buff dolomite from 628.0 feet: X-ray--quartz, analcime, feldspar. |
| 628.1 | 628.2 | Oil shale: Dark to rare light brownish gray. Distinct to faint slightly wavy and discontinuous laminae. |
| 628.2 | 629.0 | Oil shale: Olive green to medium and rare dark olive brown, dolomitic. Faint streaked bedding in upper part, becoming interbedded with tan to buff limestone laminae and thin bands in lower part. Irregular to regular thick to rare thin parting; slightly irregular fracture. |
| 629.0 | 629.4 | Tuff: Gray buff to light gray, muddy to fine sandy texture, very biotitic. Faint very thin to thick laminae and bands. Indistinct regular upper contact; irregular displaced lower contact. Sample of light gray biotitic tuff from 629.3 feet: X-ray--quartz, Na and K feldspars, biotite, analcime. |
| 629.4 | 630.0 | Oil shale: Olive buff to olive gray, calcareous to dolomitic. Faint streaked bedding and some very fine laminae. Irregular thick to thin parting; irregular and some coarse hackly fracture. |
| 630.0 | 637.9 | Oil shale and marlstone: Medium to some light olive gray to almost neutral gray, mostly calcareous. Faint to some distinct laminae and bands; some faint streaked bedding. Irregular to some regular thick parting; irregular to conchoidal fracture. Very abundant disseminated very fine round to bladed pyrrhotite(?) flakes, mostly concentrated in light gray limy layers. White to buff biotitic tuff layers at 635.5-635.6 and 636.1-636.2; small lenses at 635.4. Sample of light gray limy lamina with abundant pyrrhotite(?) flakes from 630.6 feet: X-ray--quartz, dolomite, analcime, feldspar, pyrrhotite. Sample of buff-white biotitic tuff from 635.6 feet: X-ray--quartz, feldspar, calcite, dolomite, analcime, biotite. |
| 637.9 | 640.6 | Marlstone and oil shale: Light to medium olive green and olive gray, some light gray in upper part, mostly calcareous. Fairly distinct to faint streaks and irregular discontinuous laminae. Irregular thick parting; slightly irregular to irregular fracture. Abundant pyrrhotite (?) mostly in light gray limy streaks. Buff and brown mottled silty tuff with indistinct contacts at 639.9-640.0. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|--|
| 640.6 | 641.8 | Mudstone: Medium to rare dark slightly brownish gray, calcareous. Very faint streaked bedding. Irregular thick parting; slightly irregular fracture. Fairly abundant very fine pyrrhotite (?) flakes. Few fine shaly streaks in upper part. A 1-inch regular band of dark brownish-gray oil shale at 641.2-641.3 with a thin tan to buff lenticular tuff layer in middle. Sharp regular contact with oil shale below. Sample of gray mudstone from 641.4 feet: X-ray--quartz, dolomite, calcite, illite, analcime, feldspar. |
| 641.8 | 646.8 | Oil shale: Light to medium olive green, calcareous. Faint to some moderately distinct streaks and discontinuous laminae. Irregular thick to medium parting; irregular to slightly conchoidal fracture. Some gray-buff limy streaks in upper part. Abundant very fine pyrrhotite (?) in upper part. Becoming almost neutral gray in lower 2 inches. A thin gray-buff silty tuff layer at base. Abundant very fine disseminated pyrite in lower part. Sample of olive-green oil shale with very fine disseminated pyrite from 645.6 feet: X-ray--calcite, dolomite, quartz, feldspar, pyrite, illite. |
| 646.8 | 648.2 | Oil shale: Olive gray, slightly to moderately calcareous. Faint very fine laminae and streaked bedding. Regular to irregular thick to rare thin parting; slightly irregular and conchoidal fracture. Abundant very fine disseminated pyrite. Regular very faintly streaked medium-dark slightly brownish-gray mudstone at 647.1-647.4 (like 641.4). |
| 648.2 | 649.6 | Oil shale: Medium to rare dark slightly olive to some brownish gray, moderately to slightly calcareous. Faint to some moderately distinct streaked bedding. Slightly irregular to irregular thick parting; slightly irregular fracture. Abundant very fine disseminated pyrite (and pyrrhotite?). Buff-white marly biotitic tuff band at 649.0-649.1. |
| 649.6 | 650.9 | Sandstone: Medium to light gray to slightly brownish gray, calcareous, fine to medium grained. Irregularly layered with fine brownish-gray to buff shaly laminae and streaks. Irregular thick parting; irregular fracture. Abundant mica. Some carbonaceous plant debris in shaly layers. Banded with mudstone as below near bottom. Sample of gray sandstone from 649.9 feet: X-ray--quartz, dolomite, calcite, feldspar. |
| 650.9 | 652.0 | Mudstone: Slightly brownish gray, moderately to slightly calcareous. Faint streaked bedding and rare very faint laminae. Fairly regular to irregular thick parting; fairly regular to conchoidal fracture. Abundant very fine micaceous flakes with yellow metallic luster. Rare carbonaceous plant debris. |
| 652.0 | 653.4 | Oil shale: Medium to rare light brownish and olive gray, calcareous. Faint to moderately distinct fine to medium laminae. Fairly regular to irregular thick parting; regular to irregular fracture. Some very fine metallic micaceous flakes. Rare plant debris. Some silty streaks in upper part; a 1-1/2-inch band of mudstone as below at 653.1. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|---|
| 653.4 | 653.8 | Mudstone: Slightly brownish gray, calcareous. Very faintly streaked. Fairly regular parting and fracture. Some micaceous flakes and rare plant debris. |
| 653.8 | 654.5 | Oil shale: Medium to rare dark and light olive gray, calcareous. Faint streaked bedding and some laminae. Slightly irregular thick to thin parting; irregular and rare coarse hackly fracture. Abundant very fine disseminated pyrite. |
| 654.5 | 654.8 | Mudstone: Like 653.4-653.8. |
| 654.8 | 656.9 | Oil shale: Olive gray to olive green, slightly calcareous to dolomitic. Faint streaked bedding and some very fine laminae. Irregular to fairly regular thick to rare thin parting; irregular and some slight to rare coarse hackly fracture. Abundant very fine disseminated pyrite (and/or pyrrhotite?). |
| 656.9 | 657.9 | Oil shale: Medium to rare dark and light olive green to olive, slightly calcareous to dolomitic. Moderately distinct to faint streaks and some fine to medium laminae. Irregular thick parting; irregular slight to coarse hackly fracture. Sample of olive oil shale from 657.3 feet: X-ray--dolomite, calcite, feldspar, quartz. |
| 657.9 | 658.4 | Sandstone: Brownish to almost neutral gray, calcareous, fine to medium grained. Thin to fine lenses and streaks of buff marlstone in upper part; fine regular to braided dark brownish-gray oil-shale laminae and rare thin marlstone laminae in lower part. Fairly regular thick parting; regular fracture. Patchy black carbonaceous material on parting surfaces at 658.1. |
| 658.4 | 663.0 | Siltstone and mudstone: Medium to some light gray to slightly brownish gray, calcareous. Faintly streaked to massive bands and laminae; contorted bedding at 658.6-658.9 and 662.0-662.8. Fairly regular to irregular thick to medium parting; regular to rare irregular fracture. Gray fine-grained sandstone at 661.2-661.8. Thin pieces of dense heavy very fine-grained pyrite and pyritic siltstone at 662.8. Some carbonaceous debris mostly in lower part. |
| 663.0 | 666.0 | Siltstone and mudstone: Light to rare medium and dark gray and slightly brownish gray, calcareous. Very faint streaked bedding with rare laminae and bands. Irregular to fairly regular thick parting; regular to some irregular fracture. Some carbonaceous plant debris. A thin layer of dark brownish-gray oil shale at 665.2. Sample of light gray siltstone from 663.7 feet: X-ray--quartz, K feldspar, dolomite, calcite, illite. |
| 666.0 | 667.0 | Mudstone (lean oil shale): Light to medium olive gray, some brownish gray near top, calcareous. Finely laminated near top; faint streaked bedding and irregular layers elsewhere; some very fine dark stylolitic seams. Fairly regular to irregular thick to medium parting; irregular fracture. |
| 667.0 | 667.4 | Siltstone: Light to medium slightly brownish gray, calcareous. Some very fine dark regular to stylolitic seams. Irregular thick to medium parting; slightly irregular fracture. |

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|---|
| 667.4 | 668.7 | Tuff: Yellowish to orangish tan and buff, slightly calcareous, silty. Faintly variegated and mottled in upper half becoming massive to very faintly streaked in lower part. Irregular thick parting; irregular to regular fracture. Thin dense gray limestone (?) layer at base. Sample of orangish-tan tuff from 668.3 feet: X-ray--analcime, quartz, trace calcite, feldspar. |
| 668.7 | 668.8 | Oil shale: Medium to dark brownish gray, calcareous. Faintly laminated. |
| 668.8 | 670.7 | Marlstone (mostly lean oil shale): Light to medium olive gray and some olive green, dolomitic. Faint to some moderately distinct laminae and bands. Irregular to some regular thick to rare thin parting; conchoidal to irregular fracture. Rare white to light gray limy streaks. Sample of light olive-gray marlstone from 669.3 feet: X-ray--dolomite; some quartz, feldspar, illite, calcite. |
| 670.7 | 673.8 | Oil shale: Medium and some light olive green in upper part to medium and dark olive gray in lower part, dolomitic. Very faint to some moderately distinct streaked bedding and some interrupted laminae. Irregular thick parting; irregular and some coarse hackly fracture. Abundant fine patches, streaks, and lacy stringers of orange-tan to light brownish-gray calcite below 671.4. Some very fine pyrite. Sample of olive-gray oil shale with fine tan calcite streaks and stringers from 672.4 feet: X-ray--calcite, dolomite, quartz, feldspar. |
| 673.8 | 675.2 | Oil shale: Medium and some dark olive gray, dolomitic. Faint streaked bedding. Irregular to slightly irregular thick parting; irregular and some slight to coarse hackly fracture. Abundant very fine disseminated pyrite. |
| 675.2 | 676.4 | Oil shale: Medium gray to olive gray, slightly calcareous to dolomitic. Faint streaked bedding. Irregular thick to medium parting; irregular fracture. Abundant very fine disseminated pyrite in upper part. |
| 676.4 | 678.8 | Oil shale: Medium to some dark olive gray and slightly brownish gray, dolomitic to slightly calcareous. Faint streaked bedding and some very distorted and interrupted laminae. Irregular thick to medium parting; irregular coarse hackly to some slightly conchoidal fracture. A 3/4-inch dark brownish-gray very tight silty-textured slightly wavy band at 676.8. A 2-inch tight brown silty nodule at 677.4. Few 1-to 2-inch black silty pyritic nodules at 678.0-678.2. |
| 678.8 | 682.0 | Marlstone: Medium to light slightly olive gray, dolomitic with rare calcareous layers. Faintly streaked to laminated and banded. Irregular thick to medium parting; irregular to conchoidal fracture. A 1/2- to 1-inch tapered dense buff chert (?) band at 680.6. |

Illustration No. SBR-4718P Sheet 10 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|--|
| 682.0 | 683.0 | Oil shale: Medium to rare dark brownish gray, dolomitic. Faintly streaked in upper part to laminated in lower part. Irregular thick to medium parting; irregular and some coarse hackly fracture. Some fine to small dark gray to black silty pyritic streaks and lenses in lower part. |
| 683.0 | 685.3 | Marlstone and oil shale: Medium to some light olive gray and brownish gray to almost neutral gray, dolomitic. Faint and rare distinct laminae and irregular bands. Irregular thick to medium parting; conchoidal to irregular fracture. Irregular gray-buff to buff slightly silty tuff (?) band at 683.3-683.4. Rare fine to small massive pyrite blebs and streaks. Thin dense brown nodular chert(?) layer at base. |
| 685.3 | 686.5 | Oil shale: Black to very dark brownish gray, dolomitic. Faint streaked bedding; some very irregular brownish-gray blebby dense to fine crystalline streaks in upper part. Irregular thick to rare medium and thin parting; irregular and some slight to coarse hackly fracture. Sample black oil shale with brownish-gray streaks from 685.6 feet: X-ray--calcite, quartz, dolomite, feldspar, illite. |
| 686.5 | 688.2 | Oil shale: Black to grayish brown, dolomitic. Very faintly streaked black oil shale with abundant commonly distorted and displaced grayish-brown laminae and streaks. Irregular thick parting; irregular slight to coarse hackly fracture. Some fine crystalline blebs, streaks, and patches. A 2-inch brown silty nodule in distorted oil shale at 687.5. Sample of brown silty nodule from 687.5 feet: X-ray--analcime, quartz, K feldspar. |
| 688.2 | 692.6 | Oil shale: Medium to some light olive gray and olive green, dolomitic. Faint streaked bedding and rare bands. Irregular thick to rare thin parting; irregular to conchoidal and some slight to coarse hackly fracture. Irregular wavy thin to 1-inch algal limestone at top; few thin to thick broken to regular dense olive-tan dolomite layers down to 690.0. Blebby, streaked, silty-textured, gray-buff limestone at 690.85-691.0. Very abundant fine vermiform buff tuff (?) stringers at 691.2-691.3. Irregular 1-inch dense tan cherty (?) dolomite layer with pyrite blebs at 691.9. Abundant fine pyritic crystalline calcite blebs and streaks in lower half inch. Abundant very fine disseminated pyrite in some parts. |
| 692.6 | 693.6 | Oil shale: Medium to dark and rare light slightly olive and brownish gray, dolomitic. Faintly banded. Regular to irregular thick parting; irregular to slightly conchoidal fracture. Some fine pyritic crystalline patches and blebs in upper part. Some tan to buff tuffaceous streaks near top. |
| 693.6 | 696.3 | Marlstone: Medium and some light gray to slightly olive gray, dolomitic. Faintly banded to very faintly laminated. Irregular to rare regular thick parting; fairly regular to conchoidal fracture. Very abundant fine to medium calcite crystals with pyrite below 694.1; commonly concentrated in certain layers. Sample of light gray marlstone with abundant calcite crystals from 694.4 feet: X-ray--calcite, dolomite, quartz. |

Illustration No. SBR-4718P Sheet 11 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|--|
| 696.3 | 697.3 | Oil shale: Medium and rare light olive gray, dolomitic. Faint streaked bedding and very fine laminae. Irregular to regular thick parting; irregular to conchoidal fracture. Abundant disseminated calcite crystals in upper part. Sample of olive-gray oil shale from 697.2 feet: X-ray--dolomite, quartz, some feldspar. |
| 697.3 | 698.3 | Oil shale: Olive gray to medium and dark brownish gray, dolomitic. Faintly streaked to laminated. Irregular thick parting; irregular fracture. Abundant fine to fairly coarse calcite crystals (some crystals incompletely filling crystal casts in lower part). |
| 698.3 | 699.5 | Oil shale: Very dark to some medium brownish gray, dolomitic. Faint streaked bedding and rare disrupted laminae. Irregular thick parting; irregular and some hackly fracture. Abundant fine to medium crystalline calcite streaks, patches, and blebs down to 699.0. Sharp slightly irregular contact with marlstone below. |
| 699.5 | 701.9 | Marlstone (lean oil shale?): Medium to some light slightly brownish gray, calcareous to dolomitic. Faint to rare distinct laminae and bands. Regular to irregular thick to rare thin parting; irregular and conchoidal to regular fracture. Rare pyrite streaks and blebs. Occasional thin tan to buff dolomite lenses and layers. Brown silty band at 699.9-700.0 (like 687.5 feet); bleeding tarry oil near base. |
| 701.9 | 703.9 | Oil shale: Medium to dark brownish gray and olive gray, dolomitic. Faint to some moderately distinct streaked bedding. Irregular thick parting; irregular and rare coarse hackly fracture. Few small dark gray (center) to tan (rim) chert lenses in upper part. A thin brown dolomite band at 702.5. Some coarse calcite crystals in lower inch. Sample of dark to medium brownish-gray oil shale from 703.2 feet: X-ray--dolomite, quartz, calcite, feldspar, pyrite. |
| 703.9 | 704.2 | LAYERED TUFF: Buff to tan, blebby, earthy, slightly calcareous. Few very fine dark brownish-gray oil-shale laminae in middle; irregular displaced streaks (tuff in tuff) in lower part. Slightly wavy upper contact; very irregular lower contact. Sample of tuff from 704.0 feet: X-ray--K and Na feldspar. |
| 704.2 | 704.5 | Oil shale: Black to dark and rare medium brownish gray. Very faint streaked bedding and rare distinct laminae. |
| 704.5 | 705.9 | Oil shale: Olive gray, dolomitic. Massive with rare faint streaks and laminae. Irregular thick parting; very irregular fracture. Abundant thin vertical to horizontal moderately coarse crystalline calcite streaks and stringers down to 705.6. Sample of olive-gray oil shale with crystalline calcite from 705.4 feet: X-ray--calcite dolomite, quartz, feldspar, pyrite. |
| 705.9 | 708.5 | Marlstone: Medium to some light gray to slightly olive gray, dolomitic. Very faint laminae, bands, and streaks. Irregular to rare regular thick to rare thin parting; regular to slightly conchoidal fracture. Rare fine to thin crystalline calcite streaks and stringers. |

Illustration No. SBR-4718P Sheet 12 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|---|
| 708.5 | 709.6 | Marlstone (lean oil shale?): Medium to light olive gray and brownish gray, some buff in lower 0.3 foot, dolomitic. Very faint streaks, laminae, and bands. Irregular to regular thick to medium parting; regular to slightly hackly fracture. Small buff biotitic tuff nodule at 709.4. A 1/2-inch dense to blebby brown dolomite band at bottom. |
| 709.6 | 710.4 | Oil shale: Dark and some medium grayish brown to black, slightly calcareous to dolomitic. Moderately distinct to very faint streaked bedding; some very fine laminae near top. Fairly regular to irregular thick parting; irregular and some slight to coarse hackly fracture. Abundant moderately coarse crystalline calcite streaks and patches. |
| 710.4 | 711.4 | Oil shale: Dark to medium grayish brown, dolomitic. Faint to some moderately distinct distorted streaks and laminae. Irregular thick parting; irregular fracture. Abundant moderately coarse to 1/4-inch crystalline calcite (?) streaks, stringers, patches, and disseminated crystals. Sample of coarse calcite (or shortite?) crystals with some very dark oil shale from 711.2 feet: X-ray--calcite, gaylussite, dolomite, quartz, illite. |
| 711.4 | 712.6 | Oil shale: Medium to light brownish to slightly olive gray, dolomitic. Very faint streaked bedding and some bands. Irregular thick parting; irregular to fairly regular fracture. Abundant coarse calcite crystals in upper part becoming fine-grained crystalline blebs in lower part. |
| 712.6 | 713.7 | Marlstone: Gray to slightly brownish gray, calcareous. Faint streaked bedding; becoming interlaminated with white to buff silty-textured limestone in lower part. Irregular thick to medium parting; slightly conchoidal to irregular fracture. Few small brownish-gray crystalline calcite nodules with pyrite in lower part. |
| 713.7 | 714.7 | Marlstone grading to oil shale: Medium slightly brownish and olive gray to medium and some dark grayish brown, dolomitic. Very faintly banded to faintly laminated and streaked. Irregular thick to medium parting; conchoidal to irregular fracture. Few small to fine dense brown dolomite lenses and streaks. Rare fine pyrite blebs and streaks. Tight natural high angle fracture in upper part. |
| 714.7 | 715.7 | Oil shale: Black to dark brownish gray, dolomitic. Faint streaked bedding; distorted and displaced in middle. Regular and slightly curved to irregular fracture; slightly irregular and some slightly hackly fracture. Abundant fairly coarse disseminated calcite crystals. Sample of brownish-black oil shale with rare calcite crystals from 714.7 feet: X-ray--dolomite, quartz, feldspar, illite, pyrite. |
| 715.7 | 716.7 | Oil shale: Medium to dark grayish brown and rare black, dolomitic. Faint streaked bedding and some very fine laminae. Irregular thick parting; irregular fracture. Abundant moderately coarse crystalline calcite patches. Some fine crystal cavities. |

Illustration No. SBR-4718P Sheet 13 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|--|
| 716.7 | 717.8 | Oil shale: Medium to some light olive, dolomitic. Faint streaked bedding and some bands. Irregular thick to some medium parting; irregular to slightly conchoidal fracture. Abundant crystalline patches and streaks in upper 0.3 foot. A 0.1-foot dense tan dolomite band at 717.4. |
| 717.8 | 718.9 | Marlstone: Medium to light olive gray, dolomitic. Faintly banded. Irregular thick to medium parting; slightly conchoidal to irregular fracture. Abundant disseminated to thinly layered crystals; becoming very coarse toward bottom. Abundant very fine disseminated pyrite with crystals. Sample of coarsely crystalline calcite layer with small amount of marlstone from 718.5 feet: X-ray--calcite, quartz, dolomite, pyrite. |
| 718.9 | 719.9 | Oil shale: Medium and rare dark brownish to olive gray, dolomitic. Very faint thin laminae. Fairly regular thick to medium parting; irregular to fairly regular fracture. Some thin to fine coarsely crystalline calcite layers and disseminated crystals with abundant pyrite. |
| 719.9 | 720.9 | Oil shale: Olive gray, dolomitic. Layered with coarsely crystalline calcite. Irregular to rare regular thick parting; irregular to slightly conchoidal fracture. A thin gray-buff tuff layer with abundant very fine biotite and hornblende at 720.7. |
| 720.9 | 722.5 | Marlstone: Slightly greenish gray, dolomitic. Massive to faintly streaked. Irregular thick parting; irregular to slightly irregular and conchoidal fracture. Abundant coarse to fine disseminated crystals and crystalline streaks. Abundant fine disseminated pyrite. Sample of slightly greenish gray marlstone with some calcite crystals from 721.3 feet: X-ray--dolomite, calcite, K feldspar, quartz, illite, pyrite. |
| 722.5 | 723.5 | Oil shale: Dark and some medium brownish gray to rare black, dolomitic. Faint streaked bedding; some fairly distinct slightly irregular laminae in upper part. Irregular to some regular thick to rare thin parting; irregular to slightly irregular fracture. Fairly abundant disseminated crystals. |
| 723.5 | 724.7 | Oil shale: Dark brownish gray to black, dolomitic. Faint streaked bedding. Irregular thick parting; irregular fracture. Abundant coarse to medium-fine disseminated crystals. |
| 724.7 | 725.7 | Oil shale: Black to dark rare medium brownish gray, dolomitic. Faint streaked bedding and some slightly irregular and discontinuous laminae. Regular to irregular thick to rare medium and thin parting; irregular and some slight to coarse hackly fracture. Fairly abundant disseminated calcite crystals and crystalline patches. Sample of black oil shale from 724.8 feet: X-ray--dolomite, quartz, feldspar, illite, pyrite, Mg-siderite. |
| 725.7 | 726.8 | Oil shale: Olive gray, dolomitic. Faint streaked bedding. Irregular thick parting; very irregular and some coarse hackly fracture. Abundant coarse to fine crystalline calcite patches, stringers, and streaks. |

Illustration No. SBR-4718P Sheet 14 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|---|
| | | NOTE: Some sections of core have a moderately strong odor like trona water-----from here to bottom of core. |
| 726.8 | 728.0 | Marlstone: Olive green to almost neutral gray, dolomitic. Faint laminae and streaked bedding. Irregular to rare regular thick parting; irregular to slightly conchoidal fracture. Fairly abundant crystalline laminae and streaks with pyrite; becoming porous with brown organic stains in lower part. |
| 728.0 | 730.0 | Oil shale: Olive gray and some olive green, dolomitic. Faint streaked bedding with some faint laminae and bands. Irregular to fairly regular thick to medium parting; irregular and some slight to coarse hackly fracture. Thin buff earthy biotitic tuff layer at 728.4. Some crystals in lower part. |
| 730.0 | 732.0 | Oil shale: Olive gray and olive green, dolomitic. Faint streaked bedding and rare laminae. Irregular thick parting; irregular and some hackly fracture. Abundant coarse crystals (some greenish yellow). Sample of coarse greenish-yellow shortite crystals from 731.1-731.4 feet: X-ray--shortite. |
| 732.0 | 733.0 | Oil shale: Olive gray and olive green to some medium and rare dark brownish gray, dolomitic. Faint to some moderately distinct streaks and laminae. Irregular thick parting; irregular and some hackly fracture. Abundant colorless to rare greenish-yellow crystals. |
| 733.0 | 734.1 | Oil shale: Olive gray to olive green, dolomitic. Very faint streaked bedding. Irregular thick parting; irregular hackly fracture. Abundant coarse colorless to pale greenish-yellow crystals. Sample of olive-gray oil shale with coarse crystals from 733.6 feet: X-ray--dolomite, quartz, feldspar, shortite, illite, pyrite. |
| 734.1 | 735.2 | Oil shale: Medium to some light olive, dolomitic. Very faint bands and laminae. Irregular to fairly regular thick to some thin parting; irregular to slightly conchoidal fracture. Some crystals in upper part. A 3/4-inch massive buff-white earthy tuff band at 734.6; very fine hornblende becoming abundant near base. |
| 735.2 | 736.2 | Marlstone and oil shale: Medium and some light olive to almost neutral gray, dolomitic. Very faint to faint laminae and bands; very distorted bedding in lower 0.2 foot. Regular to irregular thick to some thin parting; fairly regular to irregular fracture. Abundant crystalline layers and patches. Few moderately large irregular dense massive tan dolomite (?) nodules near base. |
| 736.2 | 737.3 | Oil shale: Medium grayish brown to black, dolomitic. Faint discontinuous laminae and streaked bedding. Irregular thick parting; slightly irregular and some slight to coarse hackly fracture. Abundant coarse crystals and small crystalline patches. |
| 737.3 | 738.4 | Oil shale: Dark grayish brown to some black. Faint streaked bedding. Irregular to fairly regular thick to some medium parting; very irregular fracture. Abundant coarse to fine crystals and crystalline streaks. Sample of very dark oil shale with fine crystalline streaks from 738.2 feet: X-ray--dolomite, quartz, shortite, feldspar, illite, pyrite. |

Illustration No. SBR-4718P Sheet 15 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|---|
| 738.4 | 739.5 | Oil shale: Medium to light olive gray, dolomitic. Faintly streaked to nearly massive. Irregular thick parting; very irregular to regular fracture. Abundant very coarse colorless to pale green crystals in upper part. |
| 739.5 | 740.5 | Marlstone: Medium to light olive gray and some almost neutral gray. Faint slightly irregular thin laminae and bands. Irregular to fairly regular thick to thin parting; irregular slight to coarse hackly fracture. Abundant crystalline layers. Several fine to thin buff to white tuff layers in upper part. |
| 740.5 | 743.6 | Oil shale: Olive gray and olive green to medium and some very dark brownish gray, dolomitic. Faint commonly slightly distorted streaks and laminae. Slightly irregular to irregular thick to rare medium parting; irregular and some coarse hackly fracture. Abundant coarse to fine crystals. Sample of olive-green oil shale with crystals from 740.7 feet: X-ray--dolomite, shortite, quartz, feldspar. |
| 743.6 | 745.4 | Marlstone: Olive gray to slightly greenish gray, dolomitic. Very faintly streaked to laminated and thinly banded. Irregular thick parting; irregular to slightly conchoidal fracture. Abundant crystals. Abundant very fine pyrite. |
| 745.4 | 747.7 | Oil shale: Medium to light olive gray and tan to some grayish brown. Faint streaked bedding and some distorted and displaced laminae. Irregular thick parting; irregular fracture. Abundant coarse to rare fine crystals. |
| 747.7 | 748.7 | MAIN TUFF: White, chalky. Very faintly bedded to massive. Irregular thick parting; regular fracture. Some very fine hornblende. Thick powdery white thermonatrite coating on outside of core. Regular contacts at top and bottom. Very thin irregular light olive-green marly fissure filling from 748.4 to 748.6. |
| 748.7 | 751.7 | Oil shale: Olive gray and olive green, rare brownish gray in upper part, dolomitic. Faint and rare distinct thin laminae to thick bands in upper part to faint distorted streaked bedding in lower part. Irregular thick parting; irregular fracture. Abundant coarse disseminated crystals and some thin crystalline layers. |
| 751.7 | 752.7 | Oil shale: Slightly greenish gray to olive gray, dolomitic. Very faintly bedded. Irregular thick to medium parting; irregular and some coarse hackly fracture. Abundant coarse crystals and crystalline streaks. |
| 752.7 | 754.7 | Oil shale: Medium to dark olive gray. Massive to very faintly streaked. Irregular thick to rare thin parting; very irregular hackly fracture. Very abundant disseminated crystals (some greenish yellow). Sample of dark olive-gray oil shale with coarse crystals from 754.3 feet: X-ray--shortite, dolomite, quartz, feldspar, illite, pyrite. |

Illustration No. SBR-4718P Sheet 16 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|---|
| 754.7 | 756.0 | Oil shale: Medium-dark almost neutral to olive gray, dolomitic. Very faint streaked bedding and interrupted laminae. Irregular parting and fracture. Abundant crystals and crystalline patches. A 1-inch dark grayish-brown tight silty to very fine sandy-textured tuff with some hornblende (?) at top. |
| 756.0 | 759.0 | Oil shale: Medium olive and olive brown in upper part to olive green in lower part, dolomitic. Massive to faintly streaked and laminated. Irregular parting and fracture. Abundant coarse crystals in most parts. Sample of olive-gray oil shale (without crystals) from 757.3 feet: X-ray--dolomite, quartz, illite, feldspar, |
| 759.0 | 760.9 | Oil shale: Medium to rare dark greenish gray and some olive gray, dolomitic. Very faint streaked bedding and some laminae. Irregular parting and fracture. Abundant coarse crystals (some greenish yellow). |
| 760.9 | 762.6 | Oil shale: Olive gray, dolomitic. Very faint streaked bedding and rare laminae. Irregular thick to some medium parting; irregular fracture. Some coarse crystals and crystalline streaks. |
| 762.6 | 764.0 | Marlstone: Gray to greenish gray, dolomitic. Very faint laminae and bands. Irregular to fairly regular thick to some medium parting; irregular to slightly conchoidal fracture. Abundant coarse crystals and small crystalline patches. A very fine white silty tuff (?) lamina at 663.95. Sample of gray marlstone with few coarse crystals from 762.8 feet: X-ray--quartz, dolomite, feldspar, shortite, illite, pyrite, Mg-siderite. |
| 764.0 | 765.0 | Oil shale: Medium to rare dark olive gray, dolomitic. Very faint laminae and streaked bedding. Irregular thick to rare thin parting; irregular fracture. Abundant coarse crystals. A 1-inch light slightly brownish gray tight very fine silty-textured band at 764.4. Few fine gray-buff to white porous silty streaks at 764.4-764.6 and near base. Sample of light slightly brownish gray silty band from 764.4 feet: X-ray--dolomite, quartz; some shortite, feldspar. |
| 765.0 | 766.5 | Marlstone: Slightly greenish gray, dolomitic. Very faint streaked bedding and some faint laminae. Irregular to rare regular thick to some medium parting; irregular fracture. Abundant coarse crystals. |
| 766.5 | 767.5 | Oil shale: Olive gray to some medium and rare light grayish brown, dolomitic. Very faint streaked bedding and rare laminae. Irregular to rare regular thick to medium parting; irregular and some coarse hackly fracture. |
| 767.5 | 770.5 | Oil shale: Medium olive gray in upper part to medium and rare dark brownish gray in lower part, 3/4-inch black layer at base. Very faint streaked bedding. Irregular thick to rare medium and thin parting; irregular to fairly regular fracture. Very abundant coarse disseminated crystals. |

Illustration No. SBR4718P Sheet 17 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|--|
| 770.5 | 772.5 | Oil shale: Medium-dark slightly olive gray in upper part to medium and rare light olive green in lower part, dolomitic. Faint streaked bedding and some laminae. Irregular to some fairly regular thick to rare medium and thin parting; slightly hackly to irregular fracture. Abundant coarse crystals; commonly concentrated in streaks, stringers, and patches in lower part. Abundant pyrite in some crystalline streaks. |
| 772.5 | 774.5 | Marlstone: Medium to some light slightly greenish to almost neutral gray, dolomitic. Very faint streaked bedding to faint and some moderately distinct laminae. Irregular to rare regular thick to some medium parting; irregular to fairly regular and rare coarse hackly fracture. Abundant coarse crystals; some concentrated in streaks and layers. |
| 774.5 | 775.9 | Oil shale: Medium to some light olive gray to greenish gray, dolomitic. Very faint streaked bedding and rare laminae. Irregular thick to medium parting; irregular fracture. Rare to abundant coarse crystals. Fine pinched out massive pyrite layer at 775.3. |
| 775.9 | 777.0 | Oil shale: Slightly greenish to olive gray, dolomitic. Very faint streaked bedding; rare light laminae. Irregular thick parting; irregular fracture. Abundant coarse crystals. |
| 777.0 | 778.4 | Oil shale: Medium to some dark olive gray, dolomitic. Very faint streaked bedding and rare laminae. Irregular thick to rare thin parting; irregular and some coarse hackly fracture. Abundant coarse colorless to pale yellow crystals. Two 1/4- and 3/4-inch grayish-brown silty tuff lenses at 778.1. |
| 778.4 | 779.9 | Oil shale: Dark to medium olive gray, dolomitic. Very faint streaked bedding. Irregular to fairly regular thick parting; irregular slightly hackly fracture. Abundant coarse colorless to brownish-yellow crystals. |
| 779.9 | 783.1 | Oil shale: Medium and rare dark olive gray to olive green, dolomitic. Very faint streaked bedding with some indistinct layering. Irregular thick parting; irregular fracture. Abundant coarse crystals; some crystalline streaks, stringers, and patches with disseminated pyrite in lower part. Irregular thin blebby tan to buff pyritic algal layer at 780.7. Sample of olive-green oil shale with crystalline streaks and stringers from 781.8 feet: X-ray--dolomite, quartz, shortite, feldspar, illite, pyrite. |
| 783.1 | 787.2 | Oil shale: Medium to rare light and dark olive gray and olive green. Very faint streaked bedding with rare laminae and bands. Irregular thick parting; irregular and some hackly fracture. Abundant coarse disseminated colorless to some yellowish crystals; becoming sparse in lower half foot. |

Illustration No. SBR-4718P Sheet 18 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|--|
| 787.2 | 788.2 | Oil shale: Medium and rare light greenish to olive gray, dolomitic to slightly calcareous. Faint regular bands and laminae. Irregular thick to rare thin parting; irregular to slightly conchoidal fracture. A fine zone of very abundant very fine pyrite blebs at 787.8. Abundant moderately coarse disseminated crystals and fine pyrite blebs in lower 2 inches. Sample of olive-green oil shale from 787.6 feet: X-ray--dolomite, quartz, apatite, illite. |
| 788.2 | 790.6 | Marlstone (partly oil shale): Medium and rare light olive gray to almost neutral gray to olive green, dolomitic to slightly calcareous. Faint laminae and bands. Irregular to regular thick parting; regular and slightly conchoidal to irregular fracture. Abundant coarse crystals; some concentrated in thin to thick layers. Some very fine disseminated pyrite blebs. A thin white earthy tuff layer with rare hornblende (?) near top. A 1-inch irregular dense tight marly band at 788.4-788.5. |
| 790.6 | 792.8 | Oil shale: Medium and some light olive gray to slightly greenish gray, dolomitic. Faint to some fairly distinct laminae and bands; some lenticular streaks and bands in lower part. Irregular to some regular thick to medium parting; fairly regular to irregular fracture. Abundant crystals and crystalline layers. Two fine white biotitic tuff laminae at 791.4. Few light brownish-gray to buff dolomite lenses and laminae in lower part. |
| 792.8 | 793.9 | Oil shale: Medium and rare light olive gray, dolomitic. Faint to moderately distinct laminae and bands in upper part to very faint streaked bedding in lower part. Irregular thick to medium parting; irregular fracture. Abundant coarse crystals. Few irregular light brownish-gray to buff cherty (?) dolomite layers in upper part. Sample of irregular buff cherty dolomite band from 793.3 feet: X-ray--quartz, dolomite. |
| 793.9 | 794.9 | Oil shale: Medium to some dark olive gray and brownish gray, dolomitic. Very faint streaked bedding to faint and some fairly distinct laminae and rare bands. Irregular thick parting; irregular fracture. Abundant coarse crystals (rarely up to 1/2 inch). A 3/4-inch irregular tan silty tuff at top. Sample of coarse crystals from 794.4-794.7 feet: X-ray--shortite. |
| 794.9 | 797.1 | Oil shale: Very dark to some medium slightly brownish and olive gray, dolomitic. Faint slightly distorted streaked bedding. Irregular thick parting; irregular and slight to rare coarse hackly fracture. Abundant coarse disseminated crystals. |
| 797.1 | 798.9 | Oil shale: Dark to some light olive gray to olive green. Mostly thin to 1-inch rounded core pieces and some rubble. Abundant coarse disseminated crystals. |

Illustration No. SBR-4718P Sheet 19 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|---|
| 798.9 | 801.4 | Marlstone: Light to medium olive green and greenish gray to some almost neutral gray, dolomitic. Faint streaked bedding and slightly irregular laminae and bands. Irregular to rare regular thick to some thin parting; slightly conchoidal to irregular fracture. Few buff dolomite lenses and streaks in upper part (like 793.3 feet). Abundant fine to very coarse crystals in lower 0.6 foot (very abundant pyrite in crystalline layer at 800.8). Thin distinct finely laminated tan dolomite layer at base. |
| 801.4 | 802.5 | Oil shale: Medium to dark olive gray. Faint slightly distorted streaked bedding and some laminae. Irregular thick parting; irregular fracture. Abundant coarse disseminated crystals. |
| 802.5 | 805.6 | Oil shale: Very dark to some medium slightly olive gray. Very faint streaked bedding. Irregular parting and fracture. Abundant very coarse to medium-fine crystals. |
| 805.6 | 807.7 | Marlstone: Medium to light gray, slightly olive near top and bottom, dolomitic to calcareous. Faint bands and laminae. Irregular thick to rare thin parting; irregular to slightly irregular and conchoidal fracture. Abundant coarse crystals in upper part; some fine-grained crystalline streaks and blebs and rare coarsely crystalline laminae in lower part. |
| 807.7 | 808.4 | Oil shale: Light to medium olive gray and rare olive buff, dolomitic. Faint and some fairly distinct laminae and bands to very faint streaked bedding. Slightly irregular to irregular thick parting; irregular fracture. Abundant coarse disseminated crystals (up to 1/4 inch). |
| 808.4 | 809.5 | Oil shale: Medium and some dark olive gray to some grayish brown, dolomitic. Faint streaked bedding. Irregular parting and fracture. Abundant coarse platy crystals (up to 3/4-inch maximum dimension). |
| 809.5 | 812.0 | Oil shale: Dark olive gray and brownish gray to some black in lower part, dolomitic. Faint streaked bedding and distorted laminae. Irregular thick parting; irregular and some coarse hackly fracture. Abundant fine to fairly coarse crystals commonly concentrated in very irregular streaks and patches. |
| 812.0 | 812.7 | Oil shale: Medium-dark to rare light olive gray. Nearly massive to faint streaked bedding and rare laminae. Irregular parting and fracture. Abundant moderately coarse disseminated crystals. Very irregular unconformable or disrupted bedding at 812.5. |
| 812.7 | 815.0 | Marlstone: Medium to light olive gray and olive green, some greenish buff, dolomitic to slightly calcareous. Faint to some moderately distinct slightly irregular laminae and thin bands. Irregular to slightly irregular thick to rare thin parting; slightly irregular to irregular and some slight to rare coarse hackly fracture. Abundant coarse crystals, mostly concentrated in thin to 1-inch layers. |
| 815.0 | 815.6 | Marlstone: Medium and rare light slightly greenish gray, dolomitic to calcareous. Faintly laminated in upper part; contorted and conglomeratic with oil-shale stringers as below in lower part. Some crystalline laminae and streaks. |

Illustration No. SBR-4718P Sheet 20 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|--|
| 815.6 | 816.9 | Oil shale: Medium to dark olive gray and brownish gray, dolomitic. Faint and rare distinct slightly distorted and displaced laminae to faint disrupted streaked bedding. Irregular thick parting; irregular and coarse hackly fracture. Abundant coarse crystals. |
| 816.9 | 820.1 | Oil shale: Dark and rare medium olive gray and brownish gray, some black in upper part, dolomitic. Faint streaked bedding; some very distorted. Irregular thick parting; irregular and some coarse hackly fracture. Abundant coarse disseminated crystals. |
| 820.1 | 821.1 | Oil shale: Medium and rare dark olive gray to olive green, dolomitic. Very faint slightly disrupted streaked bedding. Irregular thick parting; irregular hackly fracture. Abundant medium to coarse crystalline streaks and stringers (commonly with brown oil stains). Sample of crystalline streaks and stringers from 820.7 feet: X-ray--shortite; some quartz, pyrite. |
| 821.1 | 824.0 | Marlstone: Medium to some light gray with very slight green to brown tint, dolomitic. Faint to rare distinct laminae. Irregular to some regular thick to medium parting; irregular to regular fracture. Abundant coarse crystals and dense crystalline blebs. Very thin white biotitic tuffs at 821.4 and 821.7. Some medium to rare dark brownish-gray oil shale and thin to fine buff to tan dolomite lenses in lower 0.4 foot. Sample of gray marlstone with some fine dark dense crystal blebs from 823.5 feet: X-ray--dolomite, quartz, calcite, feldspar, shortite. |
| 824.0 | 824.6 | Oil shale: Medium to very dark olive gray and brownish gray, dolomitic. Very faint to some moderately distinct slightly distorted streaks and laminae. Irregular parting and fracture. Abundant coarse disseminated crystals. Fine tan dolomite (?) streaks near bottom. |
| 824.6 | 826.8 | Oil shale: Black to dark slightly brownish and olive gray, dolomitic. Very faint streaked bedding. Irregular parting and fracture. Abundant coarse disseminated crystals (up to 1/2 inch). Rare fine buff to tan dolomite streaks. Sample of black oil shale with coarse crystals from 825.1 feet: X-ray--dolomite, quartz, feldspar, shortite, illite, pyrite. |
| 826.8 | 827.3 | Oil shale: Dark to medium olive gray. Very faint streaked bedding. Irregular thick parting; irregular hackly fracture. Abundant coarse crystals. Fine irregular tan tuff (?) lamina near top. Abrupt change to leaner shale below. |
| 827.3 | 828.4 | Oil shale: Medium to rare light olive green, dolomitic. Faintly streaked to variegated. Irregular thick to some medium parting; irregular fracture. Abundant coarse to medium crystals, commonly concentrated in irregular patches and stringers. |

Illustration No. SBR-4718P Sheet 21 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|--|
| 828.4 | 831.3 | Marlstone: Medium to light greenish to almost neutral gray, dolomitic. Faint to fairly distinct laminae and bands. Irregular to some fairly regular thick to medium parting; regular to slightly hackly fracture. Abundant crystalline laminae and irregular to vermiform high angle stringers; abundant pyrite with crystals. Occasional fine dense white laminae. Some regular to wavy dense buff dolomite laminae and bands in lower 0.2 foot. Sample of light greenish-gray marlstone from 830.5 feet: X-ray--dolomite, quartz, feldspar, illite. |
| 831.3 | 832.6 | Oil shale: Brownish gray to black, dolomitic. Faint and some distinct distorted and broken streaks. Irregular thick parting; irregular slight to coarse hackly fracture. Fairly abundant coarse to medium disseminated crystals. |
| 832.6 | 833.6 | Oil shale: Dark to some medium brownish and olive gray. Faint distorted bedding. Speckled and blotched with <u>very</u> abundant fairly coarse crystalline blebs and patches. Rare light brownish-gray dolomite streaks. Irregular parting and fracture. |
| 833.6 | 835.2 | Oil shale: Olive gray and olive green, dolomitic. Very faint contorted bedding. Irregular thick parting; irregular fracture. Abundant fairly coarse crystals. Some contorted and broken stringers and inclusions of dense light gray chert. Thin broken and disrupted white biotitic tuff at 834.6. |
| 835.2 | 842.8 | Marlstone: Light to medium greenish gray, some olive gray at 839.1-840.1, dolomitic. Faint bands and thin laminae; becoming massive in some zones. Irregular to regular thick to some thin parting; irregular to slightly conchoidal fracture. Abundant coarse crystals with common fine pyrite; some in thin to thick layers or short high angle streaks and stringers. Buff marlstone with crystalline pyritic laminae and streaks in lower 0.2 foot. |
| 842.8 | 843.8 | Marlstone and oil shale: Light gray and gray buff to medium-dark olive gray, dolomitic. Distinct to faint irregular and distorted thin to fine streaks and stringers. Irregular thick to rare thin parting; irregular fracture. Some fine distorted and shredded to braided black oil-shale stringers near base. Rare fine-grained pyritic streaks. |
| 843.8 | 844.6 | Oil shale: Dark brownish gray to black; common satiny to some resinous luster, dolomitic. Faint streaked bedding and very fine laminae. Irregular to regular thick parting; slightly irregular fracture. Few coarse crystals in lower 0.2 foot. Sample of black oil shale from 844.2 feet: X-ray--dolomite, quartz, feldspar. |
| 844.6 | 845.0 | Oil shale: Very dark to some medium brownish gray. Very faint streaked bedding. Irregular parting and fracture. Very abundant coarse disseminated crystals. |

Illustration No. SBR-4718P Sheet 22 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|--|
| 845.0 | 845.7 | Oil shale: Medium to light olive gray, dolomitic. Very faintly banded. Irregular thick parting; slightly irregular to irregular fracture. Abundant fairly coarse crystals. |
| 845.7 | 848.1 | Marlstone: Light to medium greenish gray, dolomitic. Very faintly laminated to massive. Irregular to rare regular thick to rare thin parting; irregular to slightly conchoidal fracture. Abundant coarse crystals and crystalline streaks with fine pyrite. |
| 848.1 | 849.9 | Oil shale: Very dark to some medium brownish and olive gray, dolomitic. Faint streaked bedding. Irregular and rare regular thick parting; irregular and some coarse hackly fracture. Abundant coarse crystals. |
| 849.9 | 851.9 | Oil shale: Medium to some light olive green. Very faint streaked bedding. Irregular parting and fracture. Abundant coarse crystals; some concentrated in stringers and patches in lower part. Some fine to rare coarse pyrite (frequently in cubic habit). |
| 851.9 | 854.2 | Marlstone and lean oil shale: Light and some medium olive gray in upper part to light greenish gray in lower part, dolomitic. Faint laminae and bands to very faint streaked bedding. Irregular and some regular thick to medium parting; irregular to regular fracture. Some coarse crystals in upper part becoming rare in lower part. |
| 854.2 | 858.0 | Oil shale: Olive gray to olive green, rare medium to dark brownish gray in lower part. Very faint streaked bedding and interrupted laminae. Irregular parting and fracture. Very abundant coarse crystals (coarsest crystals--1/4 to 1/2 inch--are commonly pale yellowish green). Sparse disseminated pyrite cubes. A thin white tuff layer with very abundant biotite at 857.2. (856.7-856.9 missing.) Sample of oil shale with very abundant crystals from 854.9 feet: X-ray--shortite, dolomite, quartz, feldspar, calcite. |
| 858.0 | 859.4 | Oil shale: Medium to some light olive gray and olive green. Massive with some faint bands. Irregular thick to rare thin parting; irregular and some hackly fracture. Abundant coarse crystals and crystalline stringers. |
| 859.4 | 861.2 | Marlstone: Light greenish gray, slightly calcareous. Massive to very faintly streaked. Irregular thick parting; irregular and some coarse hackly fracture. Abundant coarse crystals. |
| 861.2 | 863.7 | Oil shale: Medium to dark olive gray and brownish gray. Faint streaked bedding. Irregular parting and fracture. Very abundant coarse crystals. Few thin buff to tan marlstone lenses and inclusions in upper part. Fine gray-buff biotitic tuff streaks at 863.2. |
| 863.7 | 865.7 | Oil shale: Olive gray and rare medium to dark brownish gray in upper part to medium and light olive green in lower part. Faint streaked bedding to very faint laminae and bands. Irregular parting and fracture. Abundant coarse crystals. |

Illustration No. SBR-4718P Sheet 23 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|--|
| 865.7 | 866.7 | Oil shale: Medium to light olive green and olive gray, slightly calcareous to dolomitic. Very faint laminae, bands, and streaks. Irregular thick to thin parting; irregular and some hackly fracture. Some coarse crystals. Thin white biotitic tuff at 866.2. |
| 866.7 | 868.4 | Marlstone: Light to medium greenish gray. Faint streaked bedding and rare laminae. Irregular thick to thin parting; irregular hackly fracture. Fairly abundant coarse greenish-yellow crystals. |
| 868.4 | 869.6 | Oil shale: Medium to light olive green and olive gray, dolomitic. Very faint bands, laminae, and streaked bedding. Irregular thick parting; irregular to slightly conchoidal fracture. Abundant coarse crystals. |
| 869.6 | 872.8 | Marlstone: Light and some medium olive gray to gray green, dolomitic to some calcareous. Very faint streaks, laminae, and bands. Irregular thick to rare thin parting; irregular and some coarse hackly fracture. Abundant coarse crystals. Thin grayish-brown oil-shale layer at 870.1. Sample of light greenish-gray marlstone with some coarse shortite crystals from 872.2 feet: X-ray--dolomite, shortite, quartz, feldspar, illite. |
| 872.8 | 874.5 | Oil shale: Medium greenish gray to some olive gray, dolomitic. Faint streaked bedding and rare bands. Irregular thick to some medium parting; irregular and rare coarse hackly fracture. Abundant coarse crystals. |
| 874.5 | 878.0 | Marlstone (oil shale in part?): Greenish gray to olive green, very slightly calcareous. Faint streaked bedding and indistinct irregular layers. Irregular thick to rare thin parting; irregular coarse hackly fracture. Abundant coarse greenish-yellow crystals. |
| 878.0 | 881.3 | Marlstone: Medium to light gray green. Very faint streaked bedding. Irregular thick to thin parting; irregular hackly fracture. Abundant coarse crystals, becoming concentrated in thick bands of very tightly packed crystals in lower part. Sample of coarsely crystalline band from 881.1 feet: X-ray--shortite, dolomite, loughlinite, calcite. |
| 881.3 | 882.8 | Oil shale: Olive gray and some medium to dark brownish gray. Faint streaked bedding. Irregular parting and fracture. Abundant coarse crystals. |
| 882.8 | 887.3 | Oil shale: Medium and some light olive gray to olive green, some dark olive gray in middle part. Very faint streaked bedding and rare laminae. Irregular parting and fracture. Abundant coarse crystals and crystalline patches. |
| 887.3 | 888.4 | Oil shale: Medium and some light olive green and olive gray, dolomitic. Faint streaked bedding and some thin laminae. Irregular thick parting; irregular to slightly conchoidal fracture. Fairly abundant coarse crystals. Some very fine pyrite. |

Illustration No. SBR-4718P Sheet 24 of 25.

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from U.S. Bureau of Mines Wyoming Corehole 9A

| From | To | Description |
|-------|-------|---|
| 888.4 | 889.5 | Marlstone: Light to medium greenish gray, dolomitic to slightly calcareous. Faint laminae and bands. Irregular to rare regular thick to some thin parting; slightly conchoidal to irregular fracture. Some coarse crystals. |
| 889.5 | 892.5 | Oil shale: Medium to dark olive gray and some brownish gray. Faint to rare moderately distinct streaked bedding and some very fine interrupted laminae. Irregular thick parting; irregular and coarse hackly fracture. Abundant coarse crystals. Sample of dark oil shale with abundant crystals from 890.4 feet: X-ray--shortite, dolomite, quartz, feldspar. |
| 892.5 | 894.1 | Oil shale: Medium and some dark olive gray to olive green. Faint streaked bedding and very fine distorted and interrupted laminae. Irregular parting and fracture. Abundant coarse crystals. |
| 894.1 | 896.8 | Oil shale and marlstone: Medium to light olive gray and olive green. Faint streaks, laminae, and bands. Irregular thick to some medium parting; irregular to some slightly conchoidal fracture. Abundant coarse crystals in most parts. |
| | 896.8 | Bottom of core. |
| | 896.9 | Bottom of hole. |

Illustration No. SBR-4718P Sheet 25 of 25.