

SAMPLE/CORE DESCRIPTION

Hole No. West Willow #4
 Location SE SE NW SW Sec. 36, T3S, R98W
 County and State Rio Blanco County, Colorado
 Elev. KB 7620' TD 2490 0
 Spud 6/3/80 Compl. 7/25/80
 Examined by J. Hartley - C. McMullin

From	To	
752.1	753.4	Oil Shale and Tuff interbedded, medium brown and light brown to buff, irregular bedding, poor to fair competence, very low grade, several 45-60° open irregular fractures (parallel)
753.4	771.5	Siltstone, light brown gray, massive with trace irregular bedding, poor to fair competence, trace kerogen, several scattered zones with medium to dark brown oil shale streaks and stringers, open planar and irregular parallel fractures common, light brown to buff and light gray tuffaceous band and beds as follows: from 753.8-755.4, from 757.9-758.2, from 768.6-769.0, .15 at 764.5 .50 core loss from 754.0-754.5, several scattered dark green gray occasionally metallic pyrite blebs, trace scattered leached vugs with pyrite mineralization, .20 core loss from 764.3-764.5, several scattered medium to dark brown irregular asphaltic streaks associated with oil shale or tuffaceous zones, .05-.15 irregular buff to white granular calcareous tuff bands with associated dark brown to black oil shale stringers at 768.5, 768.7 and 770.4, .20 zone with dark brown to black irregular oil shale band with associated white calcareous granular tuff streak at 771.3.
771.5	774.8	Oil Shale, light brown with buff marly streaks and stringers from top to 773.4, wavy with even and irregular bedding, fair competence, very low grade, light gray brown granular irregular tuffaceous streaks and stringers common from 773.7-774.8, several scattered irregular white calcareous and dark brown to black asphaltic tuff streaks and stringers, trace pyrite.
774.8	793.0	Siltstone, medium brown gray, massive with trace irregular bedding, poor competence, trace kerogen, open planar and irregular 45-70° parallel fractures with abundant pyrite common, .20 light brown marly band at 775.95, few scattered zones with dark brown silty irregular oil shale bands and beds, few scattered light to medium brown granular tuff streaks, stringers and bands, .30 light brown marly zone with trace wavy oil shale stringer at 783.4, .10 zone with irregular black asphalt and gilsonite mineralization at 785.3, from 788.3-788.5 abundant dark green metallic pyrite blebs and streaks, few open planar fractures with asphalt mineralization .50 core loss from 792.5-793.0.

From	To	
793.0	795.9	Oil Shale, with Marlstone, light to medium brown and buff to white, irregular with even bedding, fair competence, very low grade, buff to white irregular Marlstone streaks, stringers, bands and bed with associated buff granular tuff common, trace dark brown to black asphalt mineralization.
795.9	809.0	Siltstone, light gray brown, massive with trace irregular bedding, fair competence, several scattered medium to dark brown irregular oil shale streaks, stringers and bands, several open irregular parallel fractures some with pyrite mineralization, several scattered dark green pyrite blebs and streaks with heavy pyrite mineralized fractures from 802.1-803.4, few scattered light brown and medium gray granular tuffaceous stringers and bands, few scattered soft zones.
809.0	810.6	Oil Shale, light to medium brown, even with looped bedding, poor to fair competence, very low grade, several scattered light brown to buff granular tuffaceous streaks common, 1.10' long vertical fracture with calcite at 809.4.
810.6	813.0	Oil Shale, medium olive brown, even with trace looped bedding, fair to good competence, low grade, numerous white granular calcareous tuff blebs and streaks from top to 810.8, .30 medium brown gray siltstone bed at 811.4, open and closed planar and irregular poker chip partings with calcite cement from 811.6-811.9, .30 light brown granular tuffaceous bed with associated irregular dark brown oil shale streaks at 812.5, light brown to buff calcareous granular tuff stringer at 812.9, trace dark green gray pyrite blebs.
813.0	815.8	Oil Shale, light to medium olive brown, even with trace looped bedding, fair competence, very low to low grade, marly, few scattered light brown granular tuffaceous streaks, trace dark green gray pyrite stringers.
815.8	818.9	Oil Shale, dark brown to black, irregular bedding, fair competence, medium to high grade, .30 medium brown slightly tuffaceous concretion at 816.6, light brown granular calcareous tuff stringers at 817.6, grades to even bedding from 817.7-818.9.
818.9	824.0	Oil Shale, light olive brown with dark gray brown bands and stringers, even with trace looped bedding, fair to good competence, very low grade; few scattered light brown and white calcareous tuffaceous blebs, several zones with abundant 30°-60° open fractures with calcareous mineralization.
824.0	830.9	Oil Shale, medium gray brown, even with streaked and trace looped bedding, fair competence, low to medium grade; few scattered white calcite and black asphalt tuff blebs and streaks; thin dark green gray pyrite clay stringers at 829.5; few scattered open, planar fractures and partings some with pyrite.

From	To	
830.9	835.0	Oil Shale, medium to dark gray brown with black, even with irregular and trace looped bedding, fair competence, medium with high grade from 830.9-831.5 and 834.5-834.8; several scattered 45°-90° fractures with calcite; gradational contact with following oil shale.
835.0	836.1	Oil Shale, light olive brown with medium gray brown stringers and bands, irregular with even bedding, fair competence, low to medium grade.
836.1	838.1	Oil Shale, medium to dark gray brown, even bedding, poor to fair competence, low to medium grade; several scattered 85° fractures with pyrite and several 45°-60° closed fractures with calcite; thin light brown with medium blue gray tuffaceous stringers at 837.9.
838.1	845.0	Oil Shale, medium olive brown with dark gray brown, even with trace wavy bedding, poor to fair competence, low grade; light brown to buff granular tuffaceous stringers .10 at 840.3, .05 at 840.7 and .10 at 841.9; light to medium blue gray analcitized tuffaceous bleb and streaks at 840.4; gilsonite streaks at 843.9; several scattered light brown granular tuffaceous blebs and streaks; 90° fractures from 838.7-843.3.
845.0	846.2	Oil Shale, medium gray brown, streaked bedding, poor competence, low to medium grade; several 45-70° fractures with calcite and pyrite.
846.2	860.4	Oil Shale, medium olive brown with medium dark gray brown banding, even with trace wavy bedding, fair to good competence, low to medium grade; several scattered small light brown tuffaceous streaks and blebs; few scattered 70° fractures with calcite and pyrite; dark brown asphaltic stringer at 854.4; from 854.4-855.4 medium grade, medium to dark gray brown oil shale; from 855.5-860.4 numerous 70°-90° irregular fractures with abundant calcite; gilsonite stringers with associated asphalt at 855.4; .20 zone with light brown, very low grade oil shale band at 856.2.
860.4	868.5	Oil Shale, light to medium olive brown, even with trace looped and irregular bedding, good competence, low grade; numerous scattered small light brown tuffaceous blebs and streaks; thin, light gray, granular tuffaceous stringer at 861.1; light to medium blue gray analcitized tuffaceous blebs at 863.3; .10 light brown and light gray granular tuffaceous band at 864.4; .40 light to medium gray, calcareous silty band with disseminated pyrite at 865.6; several scattered white calcareous sealed partings; few scattered light brown granular tuffaceous stringers; large .10 pod with medium brown granular tuffaceous at 867.9; gilsonite streaks at 868.0; few scattered light blue gray analcitized tuffaceous streaks and blebs; gradational contact.

From	To	
868.5	871.9	Oil Shale, medium to dark olive brown, even bedding, excellent competence, medium to high grade; light brown granular tuff, streaks, stringers and blebs common; gradational contact.
871.9	875.7	Oil Shale, light to medium olive brown, even with trace looped bedding, good competence, low grade; light brown granular tuff and marly blebs and streaks common; trace irregular bedding.
875.7	882.5	Siltstone with interbedded oil shale bands; light to medium gray with light to medium olive brown, massive with irregular bedding, fair to good competence, very low to barren; abundant incipient fractures with dark gray pyrite mineralization common with calcareous siltstone from 881.6-882.4 siltstone with small pinpoint vugs and pyrite filling.
882.5	885.7	Oil Shale, light olive brown, even with irregular and trace contorted and looped bedding, fair competence, very low grade; marly; dark olive brown medium grade oil shale from 882.5-883.6; light to medium gray calcareous siltstone stringers and bands with disseminated pyrite common; trace gilsonite; medium brownish gray silty bed with oil shale stringers, from 885.0-885.7.
885.7	890.6	Oil Shale, medium olive brown, even with trace irregular and looped bedding, poor competence, low to medium grade; several scattered zones of solution fractures; numerous irregular and planar partings with calcite; trace leached nahcolite vugs; .40 zone of medium brown gray calcareous siltstone with few irregular stringers at 886.4 and .05 bleb at 889.4; gradational contact.
890.6	891.6	Oil Shale, medium to dark olive brown, even with trace looped bedding, poor competence, medium grade; light brown granular tuffaceous stringer at 891.1; solution fractures with calcite from 890.6-891.6; gradational contact.
891.6	916.4	Oil Shale, light to medium olive brown, even with trace looped bedding, poor competence, very low to low grade; several solution fracture zones with calcite and pyrite; few scattered light brown marly and tuffaceous stringers and streaks; numerous partings with calcite; dark olive brown, even with trace looped bedding medium to high grade oil shale from 899.6-899.9, medium gray calcareous siltstone bed; .05 medium brown, granular tuff band at 901.0; tuff stringer at 901.8; .10 gray calcareous siltstone band at 902.1; .10 solution breccia zone at 912.9; several scattered dark gray pyrite streaks and stringers.
916.4	919.1	Oil Shale, dark olive brown to black, even bedding, very poor competence, medium to high grade; solution fractures with calcite common; several scattered shaly partings; grades to medium olive brown, medium grade from 917.6-919.1; trace collapsed leached nahcolite and leached nahcolite vugs.

From	To	
919.1	922.7	Oil Shale, light olive brown, even with faint streaked bedding, poor to fair competence, very low grade; several scattered solution fracture zones with pyrite; dark gray brown granular asphalt and pyrite tuffaceous streaks at 921.6.
922.7	925.4	Oil Shale, light to medium olive brown with dark brown, even with faint irregular bedding, fair competence, very low to low grade; dark brown, irregular bedded, medium to high grade oil shale from 922.7-923.9; several scattered buff granular and dark brown asphaltic tuff blebs and streaks, at 923.2; gradational contact.
925.4	947.3	Oil Shale, light olive brown, even with trace looped bedding, fair competence, low grade; few scattered light brown granular and light blue gray analcitized tuffaceous stringers and bands; dark gray pyrite streaks, stringers and sealed fractures common; several scattered zones of solution fractures with calcite; dark brown to black with light brown bands, medium to high grade oil shale from 931.1-932.2; .10 solution breccia with collapsed leached nahcolite and leached nahcolite vugs with abundant calcite at 934.3; several scattered partings with calcite, kaolinite and asphalt; .30 zone with dark brown to black, streaked bedding, high grade oil shale band at 946.3.
947.3	963.9	Oil Shale, light to medium olive brown, even with trace looped bedding, fair competence, low grade; several scattered zones of solution fractures with kaolinite and calcite; several scattered light brown to white tuffaceous blebs, streaks, and stringers; several scattered partings with kaolinite and calcite; several scattered zones with numerous closed fractures with abundant asphalt from 959.2-961.2; several dark brown tuffaceous zones with abundant fractures with asphalt and offset bedding from 958.6-959.6 and 961.0-962.3.
963.9	966.8	Oil Shale, dark olive brown to black, streaked with irregular bedding, poor to fair competence, high grade; light brown marly blebs and streaks common; long 1.10 vertical fractures with kaolinite and pyrite at 965.0.
966.8	970.7	Oil Shale, light olive brown, even with trace looped bedding, poor competence, low grade; several scattered solution fracture zones with pyrite and kaolinite; several partings with kaolinite; light brown, very low grade, silty oil shale bed with abundant solution fractures from 969.0-969.7.
970.7	973.0	Oil Shale, medium olive brown, irregular with even bedding, fair to good competence, low to medium grade; few scattered light brown granular and dark brown asphaltic tuff blebs and streaks; gradational contact.

From	To	
973.0	986.6	Oil Shale, light olive brown, even bedding, fair competence, very low to low grade; several high angular fractures with abundant asphalt and kaolinite from 973.5-974.2; light to medium brown slightly asphaltic granular tuffaceous streaks and stringers common from 974.8-975.6 and several scattered thru-out; numerous solution fractures with asphalt and kaolinite from 975.3-976.8; medium olive brown band from 976.9-977.2; numerous brown tuffaceous bands and stringers from 977.15-978.6; trace scattered dark gray pyrite stringers; few scattered solution fracture zones; few white analcitized tuffaceous blebs and stringers from 980.0-980.7; few scattered gilsonite blebs; grades to light brown to tan marly very low grade oil shale from 979.7-986.6; .40 brown to buff massive tuffaceous bed with disseminated pyrite from 981.3-981.7; several fractures with abundant asphalt from 982.0-983.0; few scattered collapsed vugs with soft white chalky kaolinite filling at 982.9, 983.6, and 984.2.
986.6	987.9	Tuff, light brown to buff, streaked to wavy bedding, good to excellent competence; abundant light olive brown oil shale streaks and stringers.
987.9	1007.6	Oil Shale, light olive brown, even with few zones of streaked and irregular bedding; fair competence, very low to low grade; several scattered fractures with asphalt, kaolinite and calcite; numerous scattered light brown and white tuffaceous blebs, bands, stringers and streaks; few scattered solution fractures with calcite and kaolinite, brown granular irregular bedded tuffaceous from 998.8-999.1; .15 zone of light blue gray granular analcitized tuff at 1000.8; trace scattered gilsonite streaks; 45°-60° joint set from 1000.0-1005.0; large .10 tuff nodule with disseminated pyrite at 1006.0.
1007.6-	1011.4	Oil Shale, medium olive brown, irregular with streaked and even bedding, fair to good competence, low to medium grade; large irregular leached nahcolite vugs with radiated crystalline nahcolite structure at 1008.8; bedding inclined around vug 15° from 1008.5-1009.5; gradational contact.
1011.4	1017.0	Oil Shale, light olive brown to light gray brown, even with faint streaked bedding, poor to fair competence, very low grade; slightly marly, abundant hairline calcite sealed solution fractures from 1011.5-1012.5; thin white to light blue gray granular analcitized tuffaceous stringers at 1013.4, 1013.8; numerous fractures and partings with asphalt, calcite and kaolinite from 1013.5-1017.0; 0.5 core loss from 1015.3-1015.8 with altered leached nahcolite on partings at 1015.8.
1017.0	1019.7	Oil Shale, light to medium olive brown with few dark olive brown stringers and bands, even, looped and streaked bedding, fair competence, low to medium grade; several scattered gilsonite streaks and stringers, trace dark gray pyrite streaks; asphaltic tuff stringers at 1019.5; gradational contact.

From	To	
1019.7	1027.9	Oil Shale, light olive brown, even with trace faint streaked bedding, poor competence, very low grade; large leached nahcolite vug with asphalt coating and radiated crystalline structure at 1020.6-1020.8, 1021.6-1021.7; 0.8 core loss from 1020.8-1021.6 (possible loss in leached nahcolite vugs); few scattered light gray to white analcitized tuff blebs and stringers; few white calcite sealed hairline solution fractures from 1022.2-1023.5; several parallel 60° fractures (joints) with calcite from 1024.5-1027.8.
1027.9	1029.4	Oil Shale, medium olive brown, even bedding, very poor competence, low grade, abundant solution fractures, .30 core loss from 1078.7-1079.0.
1029.4	1032.1	Tuff, light brown, wavy bedding, fair competence; hard; partly analcitized; numerous medium brown oil shale streaks and stringers; few scattered fractures with asphalt, slightly asphaltic in places; slightly calcareous; with well defined undulatory upper and lower contacts.
1032.1	1038.7	Oil Shale, light to medium gray brown, even bedding, fair competence, low grade; several scattered solution fracture zones with calcite and kaolinite; few scattered gilsonite stringers; numerous white analcitized tuffaceous streaks, blebs and stringers from 1033.7-1035.8; gradational contact.
1038.7	1075.2	Oil Shale, light to medium brown, even with few zones of streaked and irregular bedding, poor to fair competence, low grade; numerous scattered 45°-60° calcite sealed fractures; few zones of solution breccia with collapsed leached nahcolite structure, carbonaceous material, calcite and kaolinite mineralization .20 at 1043.7, .10 at 1044.9, .10 at 1046.0, 1.1 from 1046.0-1047.1, .10 at 1051.4, .30 at 1053.4; several thin zones of hackly calcite sealed solution fractures; 0.4 core loss from 1046.6-1047.0, 0.2 core loss from 1049.8-1050.0; 0.2 core loss from 1064.8-1065.0; few scattered dark gray to black pyrite stringers; heavy carbonaceous material on partings at 1044.8; from 1045.0-1046.0 medium brown to dark olive brown medium grade oil shale; bedding inclined 05°-30° from 1047.0-1047.4; numerous white analcitized tuffaceous blebs from 1047.5-1047.7; scattered white analcitized tuffaceous blebs from 1048.5-1049.8; .10 blue gray-white analcitized tuff band at 1051.9; from 1053.1-1055.0 abundant solution fractures with calcite and collapsed leached nahcolite; few scattered blue gray analcitized blebs and stringers from 1055.8-1056.4; from 1067.5-1070.0 grades to medium brown medium grade oil shale; from 1070.0-1071.5 faint dark olive brown banding.
1075.2	1076.6	Oil Shale, medium to dark olive brown, even with trace looped bedding, fair competence, medium to high grade, slightly low density; gradational contact.
1076.6	1085.0	Oil Shale, light to medium brown, even with trace looped and irregular bedding, fair to good competence, low grade, few scattered solution fractures; partings with leached nahcolite structure at 1081.7; few scattered calcite sealed fractures and partings; gradational contact.

From	To	
1085.0	1092.1	Oil Shale, light to medium olive brown, even and looped bedding, good competence, low to medium grade; few thin zones with contorted bedding, few scattered gray pyrite streaks from 1089.0-1092.1; analcitized tuff stringers at 1089.2; faint tan banding from 1090.8-1091.8.
1092.1	1093.5	Oil Shale, dark olive brown, streaked with trace irregular bedding, very poor competence, high grade; solution breccia with collapsed leached nahcolite from 1092.8-1093.5.
1093.5	1096.0	Oil Shale, light brown, irregular bedding, brecciated and recemented from 1093.5-1094.6, very poor competence, very low grade; abundant collapsed leached nahcolite with kaolinite, calcite, pyrite and asphalt; grades to marly oil shale from 1095.4-1096.0; gradational contact.
1096.0	1101.5	Marlstone, light to medium brown with tan banding, even bedding, very poor competence, trace kerogen; numerous planar poker chip partings with kaolinite and pyrite; solution fracture zones with collapsed leached nahcolite, pyrite and kaolinite from 1098.3-1100.3; few scattered fractures with pyrite and kaolinite.
1101.5	1106.5	Marlstone, light brown to tan, even bedding, very poor to poor competence; numerous open planar partings with kaolinite and pyrite; numerous dark gray pyrite streaks and stringers; several scattered zones with hairline pyrite sealed fractures.
1106.5	1108.5	Marlstone, light to medium brown, even with faint streaked bedding, very poor competence, few oil shale stringers and bands; fractures with pyrite and kaolinite common; several partings with kaolinite.
1108.5	1110.0	Oil Shale, medium to dark brown, even and streaked bedding, very poor competence, medium to high grade; light brown granular tuff blebs, streaks and stringers from 1108.5-1109.0; .10 diameter partly collapsed leached nahcolite vugs with associated contorted and inclined (15°) bedding at 1109.1.
1110.0	1114.6	Marlstone, light to medium brown and tan, even with trace streaked, wavy and irregular bedding, poor competence, trace kerogen; numerous medium brown and tan granular tuffaceous bands, stringers and streaks; several open planar partings with kaolinite and pyrite; gradational contact.
1114.6	1117.1	Oil Shale and interbedded tuff; Oil Shale, dark brown to black, irregular and wavy bedding; Tuff, light gray to brown, massive with few oil shale stringers; overall: very poor to poor competence, very low grade.
1117.1	1119.5	Oil Shale, light to medium olive brown, even with trace looped bedding, fair competence, low grade; several scattered light blue gray analcitized and light brown tuff blebs and stringers; .10 irregular dark green to gray pyrite patch at 1118.0.

From	To	
1119.5	1121.0	Oil Shale, dark brown to black, even with trace looped and wavy bedding, poor competence, high grade; light brown tuffaceous stringer at 1120.5 and 1120.6; several partings with kaolinite.
1121.0	1122.8	Oil Shale, light to medium olive brown, even bedding, poor competence, medium grade; few scattered dark brown asphaltic blebs and streaks; zones with collapsed leached nahcolite, associated pyrite, and contorted bedding at 1122.4 and 1122.7.
1122.8	1136.2	Oil Shale, light olive brown, even bedding, poor to fair competence, very low grade, solution fractures with kaolinite, leached nahcolite from 1123.0-1124.7; 0.90 core loss from 1123.1-1124.0; several scattered calcite sealed solution fractures; several scattered 60°-90° fractures with pyrite and kaolinite; few scattered medium brown asphaltic blebs and streaks; trace looped bedding; trace pyrite streaks and stringers; .50 light brown to blue gray, granular analcitized tuffaceous bed (Mahogany Maker) from 1131.5-1132.0; medium gray granular tuffaceous band .075 at 1135.9.
1136.2	1137.0	Oil Shale, dark brown to black, even bedding, poor competence, high grade; thin white granular tuffaceous stringers and lamina common from 1136.2-1136.6; trace gilsonite.
1137.0	1141.1	Oil Shale, light to medium olive brown, even with trace looped bedding, fair to good competence, low to medium grade; long vertical fractures with kaolinite at 1139.8.
1141.1	1143.0	Oil Shale, dark brown to black, streaked and even bedding, fair to good competence, high grade; fairly low density; 1.0' long vertical fractures with kaolinite and asphalt at 1141.3; white granular tuffaceous stringers at 1141.3; few scattered light brown tuffaceous streaks.
1143.0	1147.7	Oil Shale, medium to dark olive brown, even and looped with trace streaked bedding, fair to good competence, high grade; slightly low density; abundant light brown banding from 1142.4-1143.5 and 1145.4-1146.3; grades to medium olive brown, medium to high grade oil shale from 1146.0-1147.7; few scattered thin light brown tuffaceous stringers and blebs; gradational contact.
1147.7	1151.8	Oil Shale, medium brown with light brown, even bedding, poor competence, medium grade; several 80° fractures (joints) with pyrite and kaolinite from 1147.7-1149.2; large 10' diameter partially collapsed leached nahcolite vug with associated 15° inclined bedding at 1150.7; .10 dark brown asphaltic band at 1151.3; "poker chip" partings from 1150.0-1151.0; gradational contact.
1151.8	1157.3	Oil Shale, medium olive brown, even with trace looped bedding, good to excellent competence, medium grade; dark mahogany brown streaked bedding, high grade oil shale from 1155.7-1156.1; .25 at 1156.4; dark mahogany brown with even bedding from 1156.8-1157.3.

From	To	
1157.3	1160.1	Oil Shale, light olive brown, even with irregular bedding, good to excellent competence, low to medium grade; numerous light gray brown irregular silty clay stringers from 1157.3-1158.3; .05 light brown marly band at 1160.05.
1160.1	1163.7	Oil Shale, medium to dark mahogany brown, even with streaked bedding, fair competence, very high grade; very low density; abundant scattered light brown oil shale bands; .20 medium brown asphaltic band at 1162.05 and thin stringers at 1161.9.
1163.7	1164.6	Oil Shale, light to medium mahogany brown, even and streaked bedding, good to excellent competence, high grade; fairly low density.
1164.6	1168.2	Oil Shale, light olive brown, even with trace looped bedding, good to excellent competence, low to medium grade; trace gilsonite streaks; faint streaked to irregular bedding from 1167.4-1168.2.
1168.2	1169.2	Oil Shale, medium olive brown, streaked, even and irregular bedding, good to excellent competence, medium to high grade; from 1168.2-1168.5 medium olive brown streaked bedding, from 1168.5-1168.9 medium olive brown, even and irregular bedding; from 1168.9-1169.2 dark olive brown, even bedding inclined 05°.
1169.2	1172.8	Oil Shale, light brown, even with trace looped bedding, fair competence, very low to low grade; slightly marly, slightly brittle; few scattered calcareous sealed solution fractures; numerous irregular black pyrite stringers from 1159.3-1159.6; several calcareous sealed partings from 1169.5-1169.8; few scattered tan granular tuffaceous streaks and blebs; .20 brittle marly zone with gray pyrite stringers at 1171.2; few pyrite stringers at 1172.1.
1172.8	1174.5	Oil Shale, medium to dark olive brown; looped, even and irregular bedding, fair competence, high grade; buff to white granular irregular tuff stringers at 1173.7, 1173.8 and 1174.4; trace gilsonite streaks; gradational contact.
1174.5	1177.1	Oil Shale, light brown to medium olive brown, even bedding, fair competence, low to medium grade; trace gilsonite streaks; few scattered tectonic fractures; blue gray analcitized tuffaceous stringers at 1175.8.
1177.1	1180.7	Oil Shale, medium olive brown, streaked bedding, fair competence, high grade; abundant light brown granular tuffaceous streaks and dark brown oil shale streaks; few partings and fractures with pyrite and calcite.
1180.7	1184.7	Oil Shale, light to medium olive brown, irregular and looped bedding, very poor competence, low grade; from 1181.7-1184.7 abundant solution fractures, solution breccia zone and irregular partings with collapsed leached nahcolite structures, calcite, and pyrite;

From	To	
1184.7	1186.8	Oil Shale, medium olive brown, streaked bedding, very poor competence, medium grade; numerous light brown marly and dark brown oil shale streaks; abundant partings and solution fractures with calcite, pyrite and collapsed leached nahcolite.
1186.8	1194.0	Oil Shale, light to medium brown, irregular with even and looped bedding, poor competence, low grade; numerous calcite sealed solution fractures and thin solution breccia zones with collapsed leached nahcolite, calcite and pyrite; bedding, irregular to contorted, inclined 5°-30° associated with solution breccia from 1188.9-1190.0; few scattered dark gray pyrite streaks and stringers,
1194.0	1195.2	Oil Shale, medium olive brown, even with looped bedding, poor to fair competence; medium to high grade; trace solution fractures with pyrite; .10 blue gray granular analcitized tuffaceous band at 1194.9.
1195.2	1209.1	Oil Shale, light olive brown to light gray brown, even bedding, very poor competence, very low grade; abundant solution fracturing with calcite and pyrite; numerous planar shaly poker chip partings some with pyrite; numerous thin crumbly solution breccia zones; collapsed leached nahcolite common, dark gray pyrite streaks and lamina common from 1200.0-1200.7 very crumbly solution breccia zones; from 1200.7-1203.9 very poor competence with very crumbly core with abundant partings and long irregular fracture with abundant pyrite; from 1205.0-1206.7 light to medium olive brown, high grade oil shale, 1.1 core loss from 1203.9-1205.0.
1209.1	1211.5	Oil Shale, light olive brown, medium olive brown and dark olive brown, even and looped bedding, fair competence, medium to high grade; from 1209.1-1209.8 light olive brown and dark olive brown banded; from 1210.3-1210.9 dark olive brown; from 1209.8-1210.3 and 1210.9-1211.5 medium olive brown; trace gilsonite streaks from 1210.3-1210.6 trace collapsed leached nahcolite and few white tuffaceous stringers; gradational contact.
1211.5	1217.8	Oil Shale, light brown to light olive brown, even and irregular bedding, very poor to poor competence, low grade; from 1213.3-1217.8 abundant solution fractures and solution breccia with calcite, kaolinite, pyrite and collapsed leached nahcolite; asphalt from 1216.7-1217.1.
1217.8	1221.4	Oil Shale, medium olive brown, even with looped bedding, fair competence, medium to high grade; several scattered tectonic fractures with offset bedding; light brown massive, brecciated and recemented asphaltic oil shale bed from 1218.2-1219.1 and banded from 1219.3-1219.5.
1221.4	1222.1	Tuff, medium gray brown, massive to wavy bedding, poor to fair competence, slightly asphaltic; few oil shale streaks and stringers, well defined planar upper and lower contact.
1222.	1224.7	Oil Shale, medium olive brown, streaked with irregular bedding, very poor competence, low to medium grade; abundant solution fractures with collapsed leached nahcolite and pyrite; numerous tan marly blebs, streaks, and irregular stringers.

From	To	
1224.7	1235.4	Oil Shale, light to medium brown, offset with trace irregular bedding, very poor competence, low to medium grade; solution fractures and solution breccia with abundant collapsed leached nahcolite and some calcite common; trace scattered dark brown asphaltic tuff blebs and stringers; thin light brown marly stringers with associated pyrite at 1229.3; .30 zone with white pinpoint calcite at 1231.0 and from 1232.4-1235.0; gradational contact.
1235.4	1241.3	Marlstone, light to medium gray brown, even bedding, very poor competence, trace kerogen; few scattered oil shale streaks and stringers; pinpoint calcite common; poker chip partings and solution fractures with abundant calcite and some pyrite; .10 medium gray granular asphaltic tuff band at 1238.1 several scattered dark pyrite lamina.
1241.3	1246.2	Marlstone, brecciated and recemented, light brownish gray, very poor competence; few scattered rotated light brown oil shale fragments; wavy bedding from 1243.5-1245.3; 0.2 core loss from 1244.8-1245.0.
1246.2	1251.3	Marlstone, light brown to tan, even bedding, very poor competence; trace light brown oil shale lamina; poker chip partings with pyrite and calcite common; trace brecciated and recemented marlstone; trace pyrite streaks; pinpoint calcite from 1250.8-1251.3; bedding inclined 15°-30° throughout.
1251.3	1252.7	Marlstone, brecciated and recemented, light blue gray, very poor competence; trace oil shale fragments; faint oil shale stringers from 1252.2-1252.7; trace pinpoint calcite.
1252.7	1253.9	Oil Shale, medium to dark brown, wavy with irregular bedding, fair competence, high grade; dark brown asphaltic bands and stringers common; trace collapsed leached nahcolite.
1253.9	1256.9	Oil Shale, marly, light brown with dark brown streaks and stringers, irregular and even bedding, poor competence, very low grade; several scattered solution fractures with asphalt, poker chip partings with pyrite common; trace looped bedding; 0.20 core loss from 1254.8-1255.0.
1256.9	1261.3	Oil Shale, dark brown, even with streaked and trace wavy bedding, very poor competence, medium grade; solution fractures with collapsed leached nahcolite common; light orange brown, slightly oxidized, granular tuffaceous streaks at 1260.5; gradational contact; 2.30 core loss from 1257.7-1260.0.
1261.3	1270.7	Oil Shale, marly light gray to brown to tan, even bedding, poor competence, very low grade; bands of tan silty claystone at 1261.6, 1262.4 and bed from 1264.0-1264.5; few scattered solution fractures with asphalt; thin light brown silty claystone stringer with pyrite at 1263.5; trace leached nahcolite vugs; medium brown, even bedded low grade oil shale from 1264.5-1265.3; several scattered light orange brown tuffaceous streaks with dark brown asphalt from 1264.7-1265.0; numerous dark gray pyrite lamina and bands of disseminated pyrite from

From	To	
		1265.4-1267.7; abundant solution fractures with offset bedding and asphalt from 1267.7-1269.6; very marly from 1268.5-1270.7.
1270.7	1275.0	Oil Shale, light gray - brown to tan, even with wavy and trace streaked bedding, poor to fair competence; very low grade; very marly, .20 solution fracture zones with collapsed leached nahcolite and asphalt at 1271.0; few scattered dark brown asphaltic tuff blebs; 75° joint set from 1273.2-1274.4; gradational contact.
1275.0	1276.7	Oil Shale, light to medium brown, even with trace looped bedding, fair to good competence, low to medium grade; dark brown asphaltic tuff streaks and bands as follows: streaks at 1275.4 and 1276.1; bands at 1276.5 and 1276.6; trace gilsonite stringers; .05 medium brown granular tuff band at 1276.65.
1276.7	1278.8	Oil Shale, marly, light brownish gray and tan, even with trace looped and streaked bedding, poor to fair competence, very low grade; few scattered dark brown asphalt and light brown granular tuffaceous blebs and streaks; trace gilsonite; several scattered dark gray pyrite lamina.
1278.8	1283.0	Oil Shale, medium gray brown, even with streaked and trace irregular bedding, fair to good competence, medium grade; light brown marly blebs, streaks and stringers common from 1280.1-1281.1; trace gilsonite.
1283.0	1284.5	Oil Shale, marly, light brownish gray, even with trace streaked bedding, very poor competence, very low to barren; solution fractures common; thin light brown marly stringers common.
1284.5	1289.9	Oil Shale, medium gray brown, streaked with trace irregular bedding, poor competence, medium grade; several solution fracture zones with collapsed leached nahcolite; abundant solution fractures from 1288.3-1289.9; tuffaceous bed with abundant disseminated pyrite from 1289.4-1289.8.
1289.9	1294.0	Oil Shale, marly, light brownish gray, even bedding, very poor competence, very low to barren; poker chip partings with pyrite common; abundant solution fractures with calcite and some asphalt; dark gray pyrite stringers at 1292.5; gilsonite stringers at 1293.3; .15 dark brown asphaltic band at 1293.2; trace dark gray pyrite streaks.
1294.0	1295.5	Oil Shale, medium to dark gray brown, streaked bedding, poor competence, high grade; numerous small light brown marly streaks and blebs; numerous light brown granular tuffaceous blebs and streaks; light blue gray analcitized tuffaceous blebs at 1294.3 and 1294.6.
1295.5	1299.3	Oil Shale, light to medium brown and light gray brown, even bedding, fair to good competence, low to medium grade; marly from 1297.6-1299.0; few scattered dark brown asphaltic tuff blebs and streaks; trace light brown to tan marly streaks and stringers.

From	To	
1299.3	1301.7	Oil Shale, medium gray brown, even bedding, fair to good competence, low grade; light gray brown to tan marly bands with interbedded dark brown to black oil shale from 1300.8-1301.7; light to medium blue gray analcitized tuffaceous stringers at 1300.0; .15 dark brown asphaltic tuff band at 1300.4; trace gilsonite; few scattered dark gray pyrite lamina; .05 zone of irregular dark gray pyrite and dark brown asphalt mineralization at 1301.0.
1301.7	1302.4	Oil Shale, dark olive brown to black, streaked bedding, poor competence, high grade.
1302.4	1303.3	Oil Shale, marly, light olive brown, even with trace looped bedding, poor competence, very low grade; .05 dark brown asphaltic tuff at 1302.9; few dark brown oil shale streaks.
1303.3	1305.6	Oil Shale, dark olive brown to black, streaked bedding, poor competence, very high grade; several scattered partings with kaolinite and asphalt, trace gilsonite; trace dark gray pyrite streaks.
1305.6	1308.7	Oil Shale, light brown, even bedding, poor to fair competence, very low grade; dark gray pyrite streaks and lamina common; .05 dark gray to brown asphaltic and pyrite tuffaceous band at 1306.4.
1308.7	1310.5	Oil Shale, dark gray brown, even with trace wavy bedding, poor to fair competence; low to medium grade, 45° fractures (joint) from 1309.0-1310.0; several scattered .05 light brown asphaltic marly tuffaceous bands.
1310.5	1322.7	Oil Shale, marly, light brown to tan, even bedding, poor to fair competence, very low grade; solution fractures common with collapsed leached nahcolite from 1312.1-1314.5; several scattered zones of dark brown, streaked to irregular oil shale streaks; several scattered dark pyrite streaks and lamina; few scattered zones of dark brown asphaltic stringers and patches; medium to dark brown, medium to high grade oil shale from 1316.5-1317.8; few scattered light brown tuffaceous stringers and streaks; zone with streaked bedding from 1319.2-1319.7; abundant dark brown oil shale stringers associated with abundant solution fractures from 1321.2-1322.7.
1322.7	1324.2	Oil Shale, dark olive brown, even bedding, fair competence, high grade; trace gilsonite.
1324.2	1328.3	Oil Shale, light olive brown, even with trace looped and offset bedding, fair competence, low grade; several scattered light brown tuffaceous blebs and stringers; trace dark brown, asphaltic, tuff blebs and stringers; 1.20' 85° fractures with kaolinite at 1325.2.
1328.3	1329.0	Oil Shale, medium to dark brown, even with looped bedding, poor competence, high grade; .05 light gray clay band at 1328.3 and 1329.0.

From	To	
1329.0	1331.5	Oil Shale, light to medium brown, even with trace looped and offset bedding, poor competence, low grade; light to medium gray pyrite lamina common from 1330.4-1331.5; solution fractures common from 1330.4-1331.5.
1331.5	1337.1	Oil Shale, marly, light gray to brown blue gray lamina, even and offset with trace looped bedding, poor competence, very low grade; light blue gray pyrite stringers and lamina common; abundant solution fractures with offset bedding; dark gray pyrite stringers at 1331.8.
1337.1	1339.5	Oil Shale, dark brown with several light brown bands, streaked bedding, poor to fair competence, medium to high grade; zone of solution fractures with associated light brown argillaceous oil shale band .20 at 1337.4; thin dark brown asphaltic tuffaceous stringer at 1337.9; numerous small light brown tuffaceous blebs and streaks.
1339.5	1342.3	Oil Shale, light olive brown, even with looped bedding, fair competence, low to medium grade; numerous light gray pyrite stringers and lamina from 1341.3-1342.0; trace irregular bedding; trace dark brown asphaltic tuffaceous blebs.
1342.3	1345.0	Oil Shale, marly, light olive brown and light brown to tan, offset with even bedding, very poor competence, very low grade; solution fractures common with collapsed leached nahcolite and kaolinite; several dark gray pyrite streaks and several dark brown asphaltic blebs and streaks from 1342.3-1342.5; leached nahcolite vugs at 1342.7; trace streaked bedding.
1345.0	1346.0	Oil Shale, medium to dark olive brown, even with trace wavy bedding, poor competence, high grade; .10 dark brown asphaltic tuff band at 1345.9; gradational contact.
1346.0	1349.0	Oil Shale, light to medium olive brown, even with trace irregular bedding, poor competence, low grade; trace gilsonite; trace light brown granular tuffaceous blebs.
1349.0	1354.8	Oil Shale, light brown, offset bedding, very poor competence, low grade; heavy solution fractures with collapsed leached nahcolite; few wavy light to medium brown oil shale stringers.
1354.8	1356.2	Oil Shale, dark brown, streaked with trace wavy bedding, poor competence, medium to high grade; light brown marly blebs and streaks common; light brown argillaceous bands with irregular to wavy dark brown oil shale streaks and stringers .10 at 1354.8, .10 at 1355.1 and from 1355.9-1356.2; .10 medium brown asphaltic tuff band at 1356.1.
1356.2	1358.3	Oil Shale, light olive brown to tan, even bedding, very poor competence, low grade; abundant white pinpoint calcite "poker chip" partings with kaolinite and asphalt common.

From	To	
1358.3	1360.1	Oil Shale, medium brown with medium gray brown, even bedding, very poor competence, low to medium grade; abundant poker chip partings with associated collapsed leached nahcolite and wavy bedding.
1360.1	1363.7	Oil Shale, marly, light brown to tan, offset with even bedding, very poor competence, very low grade; few scattered zones of white pinpoint calcite; solution fractures with calcite and collapsed leached nahcolite common from 1360.5-1362.3; 45° joint set from 1360.7-1361.7 gradational contact.
1363.7	1369.1	Oil Shale, dark gray brown, even bedding, poor competence, medium grade; several scattered dark gray pyrite streaks and lamina; abundant white calcite sealed incipient fractures with some pyrite from 1367.2-1368.6; few zones of white pinpoint calcite; light brown, very low grade, argillaceous oil shale from 1368.3-1369.1.
1369.1	1376.0	Marlstone, light brownish gray, even with massive bands, very poor competence; numerous partings with pyrite; abundant dark gray pyrite stringers and lamina; very brittle and crumbly in places; numerous scattered thin zones of very small leached nahcolite vugs replaced with pyrite; abundant evidence leached disseminated nahcolite; very argillaceous with irregular soft calcareous stringers and pinpoint calcareous blebs from 1373.0-1376.0.
1376.0	1377.5	Oil Shale, dark olive brown, streaked bedding with abundant bleby structure, fair competence, high grade; abundant tan marly blebs and black asphaltic streaks; few dark gray pyrite blebs.
1377.5	1379.7	Oil Shale, medium brown, even bedding, fair competence, low grade; abundant very small disseminated pyrite and calcite blebs; numerous dark gray pyrite stringers; gradational contact.
1379.7	1383.2	Oil Shale, light brown, even with looped bedding, very poor competence, low grade; very brittle with abundant solution fractures from 1380.6-1381.6 and 1382.4-1383.2; pyrite common in solution fractures; abundant scattered zones of very small disseminated pyrite blebs; few scattered zones with pinpoint calcite.
1383.2	1385.0	Oil Shale, medium olive brown, irregular bedding, poor competence, low to medium grade; several scattered dark gray pyrite streaks and blebs; gradational contact.
1385.0	1390.2	Oil Shale, light gray brown to light olive brown, even with trace looped bedding, poor competence, very low grade; brittle and marly; abundant dark gray pyrite streaks and stringers; abundant pinpoint calcite and pinpoint pyrite; fractures and partings with pyrite common.
1390.2	1392.9	Oil Shale, light brown and tan with faint greenish brown casting in places; even and irregular bedding; poor to fair competence, very low grade; abundant pinpoint calcite; from 1391.6-1392.0 with cemented solution fractures; highly contorted bedding from 1392.1-1392.9.

From	To	
1392.9	1401.4	Oil Shale, light brown, medium gray brown, medium brown and medium greenish brown; even with trace irregular bedding, fair competence, low to medium grade; abundant dark gray pyrite streaks, stringers, blebs and lamina; few scattered zones with abundant pinpoint calcite; trace gilsonite streaks; numerous closed hairline fractures with offset bedding.
1401.4	1404.0	Marlstone, light brownish gray, even with massive bedding, poor competence; abundant pyrite stringers; few thin zones of white pinpoint calcite streaks from 1401.4-1402.7; abundant pinpoint calcite streaks from 1402.9-1404.0.
1404.0	1406.7	Oil Shale, very marly, light olive brown to medium greenish brown, irregular bedding, poor competence, very low grade; abundant hairline sealed fractures with offset; solution fractures common; numerous white irregular calcite streaks from 1404.0-1405.0; .05 orange oxidized marly stringers at 1405.6.
1406.7	1410.6	Marlstone, light gray to light brown, irregular and massive, fair competence, abundant white irregular calcite streaks and finely disseminated pinpoint calcite blebs from 1406.7-1408.4; brittle.
1410.6	1412.6	Oil Shale, very marly, tan, even and irregular bedding, poor to fair competence, very low grade; abundant scattered pinpoint calcite streaks.
1412.6	1417.9	Oil Shale, medium olive brown to medium greenish brown, even bedding, poor competence, very low grade; slightly marly; few scattered zones of pinpoint calcite blebs and streaks; faint orange oxidized streaks and lamina common thru-out; few dark gray pyrite stringers and streaks; trace gilsonite blebs; numerous hairline fractures with offset bedding.
1417.9	1419.9	Marlstone, light gray to buff, even bedding to nearly massive, poor competence; abundant pinpoint calcite blebs and irregular calcite streaks; abundant pyrite streaks and stringers; .25 orange brown massive marlstone band at 1417.9; .20 zone of collapsed leached nahcolite with pyrite filling and orange stained calcite.
1419.9	1421.7	Oil Shale, light to medium brown, even and irregular bedding, poor competence, very low grade; very marly; abundant hairline fractures with offset bedding, abundant pinpoint vugs, several dark gray pyrite blebs; numerous pyrite stringers; orange oxidized stringers at 1420.5 and 1421.4.
1421.7	1424.0	Marlstone, light gray brown to tan, even bedding to nearly massive, poor to fair competence; trace kerogen; abundant pyrite stringers, blebs and streaks; abundant disseminated pinpoint pyrite and calcite from 1422.4-1422.7 and 1423.0-1424.0, orange oxidized tuffaceous stringers at 1421.8, 1422.2 and 1422.5.
1424.0	1427.3	Marlstone, light gray to buff, massive with trace even and irregular, very poor competence, very brittle, solution breccia from 1425.5-1426.0 and 1426.3-1427.0; numerous pyrite stringers.

From	To	
1427.3	1431.6	Oil Shale, light olive brown, dark greenish brown and medium greenish brown, even bedding, very poor competence, low grade; collapsed leached nahcolite vugs from 1427.7-1428.1; .10 irregular clay clast with slightly oxidized orange staining at 1428.2, abundant disseminated pinpoint calcite streaks; light yellow orange oxidized bands with dark gray pyrite blebs .15 at 1430.8 and .30 at 1431.3.
1431.6	1433.7	Marlstone, light brownish gray to buff, even and irregular bedding, very poor competence, abundant solution fractures and numerous planar shaly partings; abundant white disseminated pinpoint calcite; trace scattered collapsed leached nahcolite vugs; abundant pyrite stringers and lamina; very brittle, crumbly core.
1433.7	1436.3	Oil Shale, marly, light to medium greenish brown; even with abundant offset bedding, very poor competence, very low grade; abundant hairline fractures; light orange oxidized staining on marly stringers at 1435.7.
1436.3	1445.9	Marlstone, light brownish gray to buff, even and massive, very poor competence, very brittle and crumbly; abundant solution fractures and hairline sealed fractures with offset bedding; abundant pyrite streaks and stringers; abundant white disseminated pinpoint calcareous streaks and blebs; abundant evidence collapsed leached nahcolite.
1445.9	1447.8	Oil Shale, light to medium brown gray with light brown, even bedding, very poor competence, very low grade; marly; dark gray pyrite stringers and lamina common; solution fractures common; .05 light brown clay band with disseminated pinpoint pyrite at 1446.5; gradational contact.
1447.8	1453.4	Marlstone, medium blue gray with light brown to tan banding, even and offset bedding, very poor competence, trace kerogen; solution fractures with kaolinite and some pyrite common; solution breccia with angular rotated oil shale fragments from 1452.0-1453.0; light to medium gray stringers and lamina common; few scattered dark brown asphalt and dark gray pyrite streaks common.
1453.4	1455.3	Oil Shale, medium brownish gray, even bedding, very poor competence, very low grade, dark gray pyrite stringers and lamina common; few light brown tuffaceous stringers common; solution fractures with kaolinite common; gradational contact.
1455.3	1460.7	Marlstone, light brown gray to tan, even bedding to nearly massive with offset, very poor competence, trace kerogen; brittle from 1455.3-1457.0; very crumbly brittle from 1457.0-1460.7; abundant poker chip partings with pyrite and kaolinite; .30 light gray to white granular tuffaceous band with trace disseminated pyrite at 1458.0; wavy bedding associated with collapsed leached nahcolite inclined 5°-15° from 1459.2-1460.7; trace leached nahcolite vugs; pyrite stringers and lamina common.
1460.7	1461.8	Oil Shale, medium brown, streaked with offset bedding, very poor competence, medium to high grade; solution fractures with collapsed leached nahcolite and leached nahcolite vugs common.

From	To	
1461.8	1469.1	Oil Shale, marly, light brown to tan with medium blue gray banding, medium green gray, even bedding, poor to fair competence, very low grade; abundant medium gray pyrite blebs, streaks and stringers from 1462.0-1463.0; pyrite lamina common 1463.0-1465.4 and 1466.0-1469.1; several zones with poker chip partings with pyrite; few scattered small light brown and light gray tuffaceous streaks; gradational contact.
1469.1	1472.5	Oil Shale, medium to dark gray brown with greenish cast, even and streaked bedding, poor competence, low grade; 45° joint set with kaolinite from 1469.4-1471.6; few zones of solution fractures with collapsed leached nahcolite and leached nahcolite vugs; trace light brown granular tuffaceous stringers and blebs; trace looped bedding; dark brown to black irregular tuffaceous stringers at 1472.4 and 1472.5; gradational contact.
1472.5	1479.0	Marlstone, silty, light gray with light brown to tan, even bedding to nearly massive, poor to fair competence, trace kerogen; brittle, few scattered dark gray pyrite stringers and streaks; few scattered zones of light gray marly bands with disseminated pyrite; very poor competence with abundant solution fractures and offset bedding from 1476.6-1479.0; irregular bedding from 1475.4-1475.9; grades to dark gray argillaceous marlstone from 1477.0-1479.0; trace gilsonite.
1479.0	1481.1	Oil Shale, light to medium olive brown, even with contorted and streaked bedding, very poor to poor competence, low grade; solution fractures with abundant collapsed leached nahcolite and leached nahcolite vugs common; several scattered zones of medium gray to brown argillaceous and light brown marly stringers and bands.
1481.1	1490.9	Marlstone, silty, light gray brown to tan, even bedding with few silty massive bands and beds, poor competence, trace kerogen; poker chip parting zones with kaolinite common; slightly brittle; several scattered thin dark gray pyrite lamina and stringers; several scattered solution fracture zones with kaolinite; 60° joint set with kaolinite from 1485.6-1486.5; very poor competence, argillaceous, brittle solution fracture zones with collapsed leached nahcolite from 1486.6-1490.9; few light brown marly stringers.
1490.9	1493.4	Oil Shale, medium brown, streaked with trace irregular bedding, very poor to poor competence, medium to high grade; solution fractures with abundant kaolinite and collapsed leached nahcolite common; several dark gray irregular pyrite stringers from 1490.9-1491.2; scattered evidence leached nahcolite vugs.
1493.4	1497.9	Oil Shale, marly, light gray brown, even with trace looped and irregular bedding, very poor to poor competence, very low grade; several scattered zones of solution fractures with abundant collapsed leached nahcolite and kaolinite; from 1496.1-1497.6 white kaolinite replaced disseminated nahcolite blebs and streaks common; some with associated pyrite; gradational contact.

From	To	
1497.9	1500.6	Oil Shale, medium brown, streaked with even bedding, fair competence, medium grade; large .20 leached nahcolite vug with bladed structure and abundant kaolinite at 1498.8; leached nahcolite vug with kaolinite at 1499.0; few scattered white kaolinite replaced leached nahcolite vugs.
1500.6	1502.7	Marlstone, light brownish gray, even bedding, poor to fair competence, trace kerogen; abundant crossing 60° fractures with kaolinite from 1501.2-1502.0.
1502.7	1506.4	Oil Shale, light to medium gray brown, even bedding, fair to good competence, low to medium grade; thin light brown to buff tuffaceous stringers with pinpoint pyrite at 1505.5; light to medium brown granular tuffaceous streaks and stringers with asphalt from 1506.1-1506.3.
1506.4	1510.9	Marlstone, light brown with light gray brown, even to nearly massive with trace irregular bedding, fair competence, trace kerogen; numerous light to medium gray, irregular pyrite streaks and stringers from 1506.6-1506.9; several scattered light to medium brown tuffaceous blebs and streaks; .20 zones of solution fractures with brittle silty Marlstone and abundant kaolinite at 1509.5 and 1510.1; .40 zone with abundant small pyrite replaced leached nahcolite vugs at 1510.0; partings with massive pyrite at 1510.0; thin .025 stringer with abundant kaolinite replaced disseminated leached nahcolite and associated pyrite at 1510.9.
1510.9	1519.8	Oil Shale, light to medium brown, streaked with trace even and irregular bedding, poor to fair competence, low grade; zones with kaolinite replaced disseminated leached nahcolite common; several scattered light brown, brittle, marly bands and stringers; few scattered fractures with kaolinite; several scattered dark gray pyrite streaks and stringers; trace gilsonite; light brown, marly blebs common; several scattered light to medium brown, granular, tuffaceous blebs and stringers; medium gray brown, even bedding, low to medium grade oil shale from 1518.3-1518.9; 1.20 irregular vertical fractures with kaolinite at 1518.6; from 1519.2-1519.8 abundant solution fractures with kaolinite replaced disseminated leached nahcolite vugs and associated pyrite.
1519.8	1522.2	Oil Shale, light to medium gray brown, even with irregular bedding, fair competence, very low grade; marly; trace light gray brown granular and light blue gray pyrite tuffaceous streaks; gilsonite streak at 1521.0; from 1519.8-1520.3 abundant tectonic fracture with kaolinite.
1522.2	1524.0	Marlstone, light brown with light gray brown, wavy bedding to nearly massive, poor competence, trace kerogen; solution fractures common; several dark brown oil shale lamina and stringers; several scattered stringers with pinpoint pyrite; evidence leached nahcolite vugs; brittle in parts; gradational contact.

From	To	
1524.0	1529.0	Oil Shale, light brown, streaked with trace even and offset bedding, fair to good competence, low grade; leached disseminated nahcolite from 1525.6-1529.5, some replaced with kaolinite; solution fracture zones with abundant collapsed leached nahcolite from 1527.9-1529.0; few dark gray to black pyrite stringers at 1524.5; .40 zone of brittle marly nearly massive oil shale at 1524.5; several scattered light brown marly blebs.
1529.0	1532.3	Oil Shale, light brown, even bedding, very poor to poor competence, low grade; 45° joint set from 1529.1-1530.7; solution fractures with collapsed leached nahcolite and kaolinite from 1531.0-1532.3; 2 60° parallel fractures with abundant kaolinite at 1530.6 and 1531.5.
1532.3	1537.2	Oil Shale, light to medium brown, streaked bedding, fair competence, medium grade; small leached nahcolite vugs common; some replaced with kaolinite, asphalt and pyrite 0.60 core loss from 1534.4-1535.0; solution fractures with abundant kaolinite and trace leached disseminated nahcolite vugs from 1534.0-1534.4; collapsed leached nahcolite vugs with abundant kaolinite and pyrite at 1537.2.
1537.2	1547.0	Oil Shale, medium gray brown, even with trace irregular and streaked bedding, good to excellent competence, medium grade; trace gilsonite, few scattered light brown tuffaceous blebs and streaks; .10 granular tuff with abundant kaolinite at 1540.3; .30 zone of light gray brown, slightly marly, very low grade oil shale at 1540.5; few scattered dark gray pyritic blebs and streaks; few light brown marly blebs and stringers from 1544.7-1545.0.
1547.0	1549.6	Oil Shale, medium to dark brown, even bedding, excellent competence, medium to high grade; several scattered zones of thin light brown tuff stringer; thin .025 medium blue gray, analcitized tuff stringer at 1547.7; gilsonite streak at 1549.1.
1549.6	1555.1	Marlstone, silty, light brown with faint light gray brown, nearly massive with even and trace irregular bedding, fair to good competence, trace kerogen; several scattered leached nahcolite vugs, some with pyrite and kaolinite; zones of poker chip with kaolinite coating common; dark gray pyrite stringer at 1549.95; trace faint dark brown oil shale stringer; several scattered light brown granular and light blue gray tuffaceous streaks and stringers; 60° joint set with kaolinite from 1554.6-1555.1; few scattered leached nahcolite vugs replaced with kaolinite and pyrite from 1554.7-1555.0.
1555.1	1558.4	Oil Shale, light brown, even bedding, poor competence, very low grade; marly; several scattered leached nahcolite vugs some replaced with kaolinite; few scattered solution fracture zones with kaolinite; several scattered thin pinpoint pyrite stringers; large .20 leached nahcolite vugs with pyrite and kaolinite at 1557.9; gradational contact.

From	To	
1558.4	1560.5	Oil Shale, light to medium gray brown, even bedding, good competence, very low to low grade; several scattered white tuffaceous stringers and lamina; trace dark brown asphaltic streaks; .30 light brown marly band with thin light gray brown granular tuffaceous stringer at 1559.2; gradational contact.
1560.5	1563.6	Oil Shale, light brown to tan with medium brown, even with trace streaked and wavy bedding, fair to good competence, very low to low grade; few scattered 30° fractures with kaolinite; several scattered marly zones with few dark brown oil shale streaks and stringers.
1563.6	1566.6	Oil Shale, light to medium olive brown, streaked bedding, fair to good competence, medium grade; .10 dark brown asphaltic tuff with dark gray pyrite at 1564.8; several scattered light brown marly blebs and streaks; trace leached nahcolite vugs with pyrite at 1566.2; light brown and tan granular tuffaceous stringer at 1566.4.
1566.6	1570.9	Oil Shale, marly, light brown to tan, even bedding, poor competence, very low grade; several scattered tan marly zones with dark brown oil shale stringer; several scattered pinpoint pyrite stringer; several scattered light brown brittle argillaceous bands; several scattered leached nahcolite vugs some with kaolinite; trace irregular and streaked bedding; .20 medium brown, medium grade oil shale band at 1570.2; gradational contact.
1570.9	1573.8	Oil Shale, light brown, irregular with trace even and streaked bedding, poor to fair competence, very low to low grade; 0.70 core loss from 1571.7-1572.4; several scattered small leached nahcolite vugs with kaolinite; large .20 irregular leached nahcolite vugs with heavy kaolinite filling and some pyrite at 1572.7; solution fracture zone with kaolinite from 1572.4-1572.8; thin dark gray pyrite tuffaceous stringer at 1573.7.
1573.8	1575.7	Oil Shale, medium brown, even bedding, poor to fair competence, low to medium grade; several scattered light brown tuffaceous streaks, blebs and lamina; light blue gray to white analcitized tuff stringer at 1575.5.
1575.7	1582.7	Oil Shale, marly, light brown and light gray brown, nearly massive with trace even and irregular bedding, poor to fair competence, very low grade; several scattered 45-60° fractures with kaolinite; several scattered zones of leached nahcolite vugs; several scattered light brown marly zones with few dark brown oil shale streaks and stringers.
1582.7	1586.9	Oil Shale, light to medium brown, streaked with trace even and irregular bedding, good to excellent competence, medium grade; numerous leached nahcolite vugs some with kaolinite and pyrite from 1582.7-1583.4; light brown marly blebs and streaks common; several scattered dark green gray pyrite blebs and streaks.

From	To	
1586.9	1592.5	Oil Shale, light brown with light gray brown cast, even bedding, good competence, low grade; several scattered zones with light brown, irregular tuffaceous blebs and streaks; medium gray pyrite tuff stringers at 1590.4; trace irregular bedding; trace dark brown asphaltic blebs; gradational contact.
1592.5	1596.4	Oil Shale, medium gray brown, streaked with trace even bedding, good to excellent competence, medium grade; several scattered dark brown asphaltic blebs.
1596.4	1599.1	Oil Shale, light brown, even bedding, poor to fair competence, very low grade; few scattered dark brown asphaltic blebs; trace light brown granular tuffaceous blebs and streaks; 1.20' long vertical fracture with heavy asphalt coating and several associated fractures from 1597.0-1598.2; several light brown to white tuffaceous stringer at 1598.2.
1599.1	1610.9	Oil Shale, medium brown with medium gray brown, streaked with irregular bedding, good to excellent competence, medium to high grade; trace gilsonite; from 1602.4-1605.5 medium gray brown and light brown, irregular and streaked bedding medium grade oil shale; several light brown granular and dark gray pyrite tuffaceous blebs and streaks from 1604.0-1606.0; leached nahcolite vugs with pyrite and kaolinite at 1602.6 and 1603.0; numerous light brown granular tuffaceous lamina and stringers from 1609.6-1610.9; gradational contact.
1610.9	1616.15	Oil Shale, light to medium brown, irregular and even with trace streaked bedding, good competence, low to medium grade; several scattered light brown to white tuffaceous streaks and stringers, trace looped bedding; light brown marly oil shale with abundant leached nahcolite vugs from 1612.5-1613.1; .85 core loss from 1613.1-1613.95; few scattered medium brown asphaltic tuff streaks and stringers, 45° joint fractures set with kaolinite from 1615.0 and continued into next lithologic unit (1618.2).
1616.15	1623.0	Oil Shale, marly, tan to buff, nearly massive with even and irregular bedding, fair competence, very low grade; numerous thin zones of very small leached nahcolite vugs, few scattered gray pyrite streaks at 1616.6; several dark gray to black pyrite blebs and stringers from 1620.1-1621.1; few scattered small leached nahcolite vugs replaced with kaolinite and pyrite; numerous 30°-60° fractures with kaolinite from 1621.4-1623.0; .40 zone of light olive brown streaked bedding oil shale at 1618.1.
1623.0	1629.5	Oil Shale, medium olive brown with trace light olive brown and medium gray brown, fair competence, medium grade; several open and closed partings with leached disseminated nahcolite from 1623.0-1625.0; few scattered small leached nahcolite vugs; thin brown asphaltic tuff stringers at 1625.2; few scattered gilsonite streaks; large irregular leached nahcolite vugs with pyrite and kaolinite from 1626.6-1627.0.

From	To	
1629.5	1633.9	Marlstone, light brownish gray to buff, even bedding, fair to good competence, trace kerogen; dark brown oil shale stringers and lamina common; dark gray to black pyrite stringer at 1631.7; thin leached disseminated nahcolite stringer and small vugs from 1631.8-1632.0; few thin leached disseminated nahcolite zones with kaolinite and pyrite .25 at 1632.9, .10 at 1633.5, .10 at 1633.8.
1633.9	1637.5	Oil Shale, medium olive brown, even and streaked bedding, fair to good competence, medium to high grade; few scattered gilsonite streaks; large irregular bladed partly leached nahcolite patch with translucent brown coarse crystalline nahcolite and associated pyrite coating and inclined bedding .50 at 1636.5.
1637.5	1645.6	Marlstone, light gray brown to buff, even with looped, wavy and nearly massive bedding; good competence, trace kerogen; silty, few scattered brown oil shale lamina; from 1638.7-1639.5 few small leached vugs; from 1645.0-1645.6 several scattered leached disseminated nahcolite stringers, .10 light brown, brittle argillaceous marly band at 1645.0; gradational contact.
1645.6	1651.4	Oil Shale, light olive brown with light to medium olive brown, even with streaked and irregular bedding, good competence, low grade; numerous leached nahcolite vugs some with pyrite and kaolinite mineralization from 1647.2-1649.0; several scattered light brown to buff granular tuffaceous blebs and streaks; few light brown tuff stringers at 1649.1; abundant dark brown asphaltic blebs and streaks from 1646.3-1646.5; few scattered leached nahcolite vugs from 1645.6-1646.5.
1651.4	1654.6	Oil Shale, light brown, even bedding, good competence, very low to low grade, few scattered dark gray pyrite and dark brown asphaltic streaks and stringers; thin light brown granular tuffaceous stringers with associated dark gray pyrite mineralization at 1653.4 and 1654.1; .70 long 90° fractures with kaolinite at 1651.6.
1654.6	1657.4	Oil Shale, light to medium olive brown, even bedding, good competence, low to medium grade; trace gilsonite, streaked bedding from 1655.9-1656.5; grades to medium gray brown low grade oil shale from 1656.0-1657.4.
1657.4	1661.3	Marlstone, light gray brown to buff, even with nearly massive bedding, poor to fair competence; trace kerogen; medium gray brown, even bedding, low to medium grade oil shale bed from 1658.5-1659.0; few scattered light brown to buff marly blebs and streaks; dark gray to black pinpoint pyrite blebs, streaks, and stringers common; solution fracture zone with kaolinite from 1659.2-1659.7; several scattered white tuffaceous streaks and stringers with associated pyrite mineralization; abundant dark green gray to black irregular pyrite streaks and stringers; gradational contact.
1661.3	1664.1	Oil Shale, light to medium brown, even and streaked with irregular bedding, good competence, low to medium grade; dark gray to black irregular pyrite streaks and stringers common; dark brown asphaltic tuff blebs at 1662.5, and 1663.7; .30 dark brown asphaltic band at 1663.8; gradational contact.

From	To	
1664.1	1665.1	Oil Shale, light to medium gray brown, even bedding, good competence, medium grade numerous thin white granular tuffaceous lamina from 1664.1-1664.4.
1665.1	1677.0	Oil Shale, marly, light olive brown with tan, even bedding, good competence, very low grade; few scattered light brown marly blebs and streaks; trace gilsonite; .025 light brown granular tuffaceous stringer at 1671.9; dark gray pyrite stringer at 1672.4; 1.10 vertical fracture with asphalt at 1669.7; several scattered dark gray pyrite streaks and stringers from 1675.4-1675.9.
1677.0	1684.5	Marlstone, silty and dolomitic, light gray brown to buff, even with trace wavy and irregular bedding, good competence, trace kerogen; numerous scattered dark brown oil shale stringers and lamina; abundant interbedded dolomitic stringers and streaks; .15 light brown irregular marly patch with dark brown very calcareous mineral-nahcolite ? at 1680.8; gradational contact.
1684.5	1695.4	Oil Shale, light olive brown, even with streaked and irregular bedding, excellent competence, low grade; several scattered medium gray pyrite streaks and stringers from 1684.5-1685.0; dark green gray to black, irregular, pyrite stringers at 1689.5, 1690.9 and 1691.6; several scattered light brown marly blebs; from 1692.0-1692.6 dark olive brown to black, medium to high grade oil shale; several scattered dark brown asphalt and black pyrite blebs from 1691.6-1691.8; few scattered dark brown asphalt and light brown granular tuff blebs from 1694.1-1694.6.
1695.4	1698.5	Oil Shale, light olive brown, streaked bedding with bleby structure, excellent competence, low to medium grade; light brown marly blebs and streaks common; several scattered dark green to gray pyrite blebs, streaks and stringers; irregular bedding from 1697.1-1697.8.
1698.5	1701.1	Oil Shale, light brown with medium to dark gray brown banding, even with trace irregular bedding, excellent competence, medium grade; trace dark blue gray analcitized tuffaceous blebs and streaks; gradational contact.
1701.1	1702.8	Oil Shale, light olive brown, even with trace irregular bedding, excellent competence, very low to low grade; numerous scattered medium gray granular tuffaceous blebs from 1701.7-1702.4 few scattered light brown granular tuff lamina.
1702.8	1706.1	Oil Shale, medium gray brown, streaked with trace even and irregular bedding, excellent competence, medium grade; few scattered light blue gray analcitized tuff; few scattered light brown granular tuffaceous blebs; .20 zone of 15° inclined bedding at 1703.9.
1706.1	1709.2	Oil Shale, light to medium olive brown, even bedding, poor to fair competence, low to medium grade; few scattered medium blue gray analcitized tuffaceous blebs and streaks; few scattered light brown tuffaceous blebs and streaks.

From	To	
1709.2	1717.7	Oil Shale, marly, light gray brown to tan, even with trace wavy bedding, good to excellent competence, very low grade; few scattered light brown tuffaceous blebs and streaks; few scattered dark brown asphaltic blebs and streaks; trace gilsonite; few scattered light blue gray dolomitic streaks and stringers; several scattered light blue gray tuffaceous lamina and stringers.
1717.7	1723.8	Oil Shale, medium to dark olive brown, even with streaked bedding, good to excellent competence, medium to high grade; light brown tuffaceous blebs common from 1717.7-1721.3; few scattered dark brown asphaltic blebs; medium olive brown, streaked bedding, medium grade, from 1717.7-1719.0.
1723.8	1728.9	Oil Shale, medium to dark olive brown and dark brown with light brown banding, even with streaked bedding, good competence, high grade; streaked bedding medium to high grade oil shale with abundant light brown blebs, streaks and bands from 1723.8-1725.4; 1725.4-1727.3 medium to dark mahogany brown, even bedding, high grade oil shale with several light brown bands; from 1727.3-1728.1 dark olive brown to black, even bedding, high grade oil shale; from 1728.1-1728.9 medium to dark olive brown with light brown banding, streaked and irregular bedding, medium grade oil shale; trace offset bedding.
1728.9	1734.4	Oil Shale, medium olive brown, streaked bedding, excellent competence, medium grade; several scattered light brown blebs and streaks; several scattered dark brown asphaltic blebs and streaks; few scattered light brown tuffaceous blebs and streaks; even bedding from 1732.8-1734.4; .10 light brown marly band at 1733.7; gradational contact.
1734.4	1744.4	Oil Shale, medium to dark olive brown, even with faint streaked bedding, poor to fair competence, medium to high grade; light brown marly zones with several dark brown irregular oil shale stringers from 1735.4-1735.9 and 1737.4-1737.7; 2.9 core loss from 1737.7-1740.6; light to medium brown irregular marly stringers with pyrite and asphalt at 1741.6; few scattered light brown granular tuffaceous blebs and streaks; gradational contact.
1744.4	1747.9	Oil Shale, light to medium olive brown, even with trace streaked and wavy bedding, good to excellent competence, medium grade; light to medium brown slightly marly stringers at 1745.1 and .30 zone at 1747.1.
1747.9	1748.9	Oil Shale, light olive brown to tan, even with trace wavy bedding, excellent competence, very low to low grade; slightly marly, .10 zone with dark brown wavy oil shale stringer at 1748.0.
1748.9	1752.6	Oil Shale, medium olive brown and dark olive brown, streaked bedding with blebby structure, excellent competence, medium to high grade; numerous scattered large light brown marly blebs; several scattered dark asphaltic blebs and streaks.

From	To	
1752.6	1754.8	Oil Shale, dark olive brown with light olive brown from 1753.6-1754.2; even with streaked bedding from 1753.6-1754.2; poor competence, high grade; several scattered light brown slightly asphaltic stringers from 1754.3-1754.8; trace gilsonite.
1754.8	1758.2	Oil Shale, medium olive brown and light olive brown with tan banding, even with trace looped and wavy bedding, poor to fair competence, low to medium grade; slightly dolomitic from 1756.0-1757.6; light gray brown, marly bands at 1756.6 and 1756.8; light brown to tan marly zone .25 at 1757.7 few scattered zones of irregular dark gray pyrite streaks; several scattered light brown marly streaks and stringers.
1758.2	1761.0	Oil Shale, medium olive brown, streaked bedding, excellent competence, medium grade; several scattered large light brown marly blebs; few scattered zones of dark brown wavy oil shale stringer; .10 light brown marly patch at 1760.1.
1761.0	1762.7	Oil Shale, medium to dark olive brown, even with streaked bedding, good to excellent competence, medium to high grade; several scattered light brown irregular marly zones; gradational contact.
1762.7	1765.3	Oil Shale, medium olive brown and light brown to tan, even with wavy and trace streaked bedding, good to excellent competence, low grade; .10 light brown marly bands at 1763.2 and 1763.8; light brown to tan wavy bedding marlstone bed from 1764.1-1765.3; slightly dolomitic from 1763.1-1763.4.
1765.3	1768.4	Oil Shale, medium olive brown, streaked bedding with blebby structure and even bedding, excellent competence, medium grade; trace irregular bedding; several scattered large light brown marly blebs; .10 light brown marly patch with gilsonite at 1766.8; few scattered medium green gray pyrite blebs and streaks; trace gilsonite.
1768.4	1770.9	Oil Shale, dark brown to black, even with trace streaked bedding fair competence, high grade; medium olive brown, medium grade oil shale with streaked bedding from 1768.4-1768.7.
1770.9	1775.0	Oil Shale, light olive brown with tan banding, even, streaked and wavy bedding, fair to good competence, low to medium grade; several scattered light brown marly bands and stringers; several scattered zones with numerous light brown marly blebs; .10 zone with irregular dark brown oil shale at 1773.1; medium olive brown from 1774.0-1775.0.
1775.0	1776.3	Oil Shale, light olive brown, streaked bedding, excellent competence, low to medium grade; light brown marly blebs and streaks common.

From	To	
1776.3	1786.3	Oil Shale, dark olive brown with several light brown bands, even with streaked and trace irregular bedding, good competence, medium to high grade; zones with abundant dark green gray pyrite blebs and streaks from 1778.2-1779.0 and 1779.8-1781.4; trace gilsonite streaks; light to medium olive brown from 1785.0-1786.3; few scattered dark green gray pyrite blebs and dark brown asphaltic blebs.
1786.3	1789.7	Oil Shale, light to medium brown, streaked with trace even bedding, excellent competence, medium grade; light brown marly blebs common; numerous scattered small vugs with dark green gray pyrite and dark brown asphaltic filling from 1786.8-1789.7; trace gilsonite.
1789.7	1792.4	Oil Shale, dark olive brown, even bedding, fair to good competence, high grade; several scattered light brown bands from 1791.6-1792.4; trace offset and looped bedding.
1792.4	1795.6	Oil Shale, light to medium olive brown with faint bluish cast, even with trace streaked and irregular bedding, good to excellent competence, low to medium grade; several scattered light brown marly bands and stringers; several scattered zones of numerous light brown marly blebs and streaks with some associated pyrite.
1795.6	1797.1	Oil Shale, light brown to tan, even with streaked and irregular bedding, excellent competence, very low grade; marly, numerous scattered dark green gray pyrite blebs; several scattered white calcareous blebs from 1796.6-1797.1.
1797.1	1804.8	Oil Shale, light to medium olive brown, with several light brown bands, even bedding, good to excellent competence, low grade; slightly silty, several scattered dark green gray pyrite blebs and streaks from 1797.1-1799.8; several scattered white calcareous blebs, streaks and lamina from 1797.1-1799.6; dark gray pyrite stringer at 1804.6; trace gilsonite.
1804.8	1808.1	Oil Shale, marly, light brown to tan, even bedding, good to excellent competence, very low grade; dark gray pyrite streaks and stringers common; trace gilsonite.
1808.1	1819.0	Marlstone, dolomitic, light brown with light blue gray cast, even with trace wavy bedding, good to excellent competence; several scattered dark brown wavy oil shale stringer and lamina; few scattered zones of dark gray pyrite streaks and lamina; gradational contact.
1819.0	1824.5	Marlstone, silty and dolomitic, light brown to tan with light blue cast, even with irregular and trace blebby structure, fair competence; dark brown oil shale stringers and lamina common; light gray, medium crystalline with granular texture, dolomitic streaks and blebs common; light brown very low grade oil shale with even and streaked bedding from 1821.6-1821.75 and 1822.3-1822.7; gradational contact.

From	To	
1824.5	1834.6	Oil Shale, light olive brown to tan, even with irregular and streaked bedding, excellent competence, very low grade; few scattered zones of dark brown oil shale stringers and lamina; few scattered dark gray pyrite blebs and streaks; few scattered light brown marly blebs, streaks and bands; numerous dark gray pyrite blebs and streaks from 1833.1-1834.0; gradational contact.
1834.6	1853.6	Oil Shale, silty and dolomitic, light brown to tan with zones of light blue gray cast, even, wavy and streaked bedding with trace blebby structure, excellent competence, very low grade; marly; several scattered zones with medium to dark brown oil shale stringers and lamina; several scattered zones with light blue gray, medium crystalline, granular texture dolomitic blebs and streaks; few scattered light brown marly stringers and blebs; 1.0 long 90° fractures with calcite at 1843.9; gradational contact.
1853.6	1858.7	Oil Shale, light brown to tan, even with trace streaked bedding, excellent competence, low grade; several scattered zones with dark brown oil shale stringers and lamina; few scattered light brown marly blebs, trace asphaltic blebs.
1858.7	1860.4	Oil Shale, medium to dark brown, even with trace irregular bedding, fair competence, medium to high grade; gilsonite streaks at 1859.4; few scattered thin light brown marly streaks and stringers, light brown marly band at 1860.3.
1860.4	1861.4	Oil Shale, light brown to tan, even with wavy bedding, excellent competence, very low grade; marly; trace looped bedding; few scattered light brown granular tuffaceous blebs and streaks; trace light brown marly blebs.
1861.4	1863.8	Marlstone, silty and dolomitic, even with wavy bedding, excellent competence, medium to dark brown oil shale stringers and lamina common; gradational contact.
1863.8	1867.9	Oil Shale, light brown, even with trace wavy bedding, excellent competence, very low to low grade; slightly marly; trace light blue gray dolomitic streaks and stringers; trace dark gray pyrite streaks; gradational contact.
1867.9	1870.1	Oil Shale, light to medium brown, streaked with even bedding, excellent competence, medium grade; several scattered light brown marly blebs, streaks and stringers.
1870.1	1871.6	Oil Shale, light brown, faintly streaked bedding, excellent competence, low to medium grade; several scattered light brown marly and dark brown asphaltic blebs.

From	To	
1871.6	1873.0	Oil Shale, dark brown, even with trace streaked bedding, excellent competence, high grade; .10 zone with numerous irregular dark gray pyrite streaks at 1870.3; .025 light brown marly band at 1872.9.
1873.0	1873.8	Oil Shale, light to medium brown banded, streaked with even bedding, excellent competence, low to medium grade, few scattered light brown marly stringers.
1873.8	1884.1	Oil Shale, light brown with trace tan, even with trace looped and streaked bedding, excellent competence, very low grade; slightly marly; several scattered zones with dark brown oil shale stringers and lamina, light blue gray dolomitic streaks from 1874.3-1875.4; marly from 1873.8-1874.5; gradational contact.
1884.1	1884.8	Oil Shale, light to medium olive brown, streaked with even bedding, excellent competence, very low to low grade; several scattered light brown marly and dark brown asphaltic blebs.
1884.8	1886.4	Oil Shale, medium brown, even with faint streaked bedding, fair competence, medium grade; light brown marly and dark brown asphaltic blebs common; gilsonite streaks at 1886.0; gradational contact.
1886.4	1889.9	Oil Shale, dark brown with medium brown, even with trace irregular bedding, excellent competence, high grade; thin medium brown asphaltic tuff stringers at 1888.1; trace gilsonite.
1889.9	1892.1	Oil Shale, medium brown and light brown to tan, even with trace off-set bedding, good competence; very low to low grade; gradational contact.
1892.1	1908.2	Oil Shale, marly, tan, even with wavy bedding, good to excellent competence, very low grade; silty and slightly dolomitic, several scattered zones with light blue gray dolomitic streaks and stringers; several dark gray pyrite streaks, stringers and lamina from 1892.1-1892.4; light to medium brown oil shale stringers and lamina common; 70° joint set with calcite from 1903.5-1904.4; trace offset bedding, several scattered planar shaly partings; gradational contact.
1908.2	1917.4	Oil Shale, light gray brown and light brown with light blue gray cast, even with wavy and trace faint streaked bedding, good to excellent competence, very low grade; slightly marly and dolomitic; several scattered zones with light blue gray dolomitic stringers, several 90° closed fractures with calcite and asphalt from 1908.3-1911.6; light brown to tan marly oil shale from 1912.6-1913.6 and 1914.1-1914.7; .10 zone with several dark brown asphaltic streaks at 1912.9; grades to medium olive brown, medium to high grade oil shale from 1915.9-1917.4.
1917.4	1920.4	Oil Shale, dark olive brown with black, even bedding, good to excellent competence, high grade; fairly low density; numerous scattered dark brown asphaltic blebs from 1917.4-1917.9; thin light brown tuffaceous stringer at 1918.0; gradational contact,

From	To	
1920.4	1925.1	Oil Shale, light to medium olive brown, even with trace faint streaked bedding, fair to good competence, low to medium grade; several scattered light brown oil shale bands and stringers from 1920.4-1922.0; gradational contact.
1925.1	1933.5	Oil Shale, light gray brown and light brown, even bedding, fair to good competence, very low grade; marly; few scattered dark gray pyrite streaks and stringers; few thin light brown to tan marly stringers.
1933.5	1958.0	Oil Shale, dolomitic and marly, light brown to tan, wavy bedding with trace massive, good competence, very low grade; abundant very fine to fine crystalline, light blue gray, dolomitic streaks and stringers with granular texture; few scattered buff massive marly and dolomitic beds; several planar shaly partings from 1937.8-1940.7; joint set of 70° crossing fractures from 1949.4-1950.7; nearly massive bedding from 1944.3-1957.1.
1958.0	1962.4	Oil Shale, light gray brown, even with trace wavy and irregular bedding, excellent competence, very low grade; marly; several scattered light brown granular tuffaceous blebs with trace asphalt; .10 irregular marly patch at 1959.9.
1962.4	1968.6	Oil Shale, light to medium gray brown, wavy with even and trace offset bedding, excellent competence, very low grade; slightly dolomitic; marly; few scattered light brown marly blebs and streaks; trace irregular bedding from 1967.9-1968.6; gradational contact.
1968.6	1971.5	Oil Shale, dolomitic, light brown gray, irregular with wavy bedding, good competence, very low grade; abundant light blue gray, very fine to fine crystalline dolomitic streaks and stringers with granular texture; 2.90 long 90° fractures with calcite and asphalt at 1968.6.
1971.5	1975.1	Oil Shale, light olive brown with medium to dark brown from 1971.5-1972.3; faintly streaked with even bedding, good competence, very low grade; several scattered dark gray pyrite blebs; few scattered light brown marly blebs and streaks.
1975.1	1978.1	Oil Shale, light and medium brown, faintly streaked bedding with wavy bedding and blebby structure, excellent competence, medium grade; light brown marly blebs with trace asphalt common.
1978.1	1997.4	Oil Shale, light brown with light gray brown and medium brown, faintly streaked bedding with wavy bedding, excellent competence, low to medium grade; several scattered light brown marly blebs with trace asphalt; trace gilsonite; few scattered thin slightly dolomitic bands; zones of dark brown medium to high grade oil shale .30 at 1988.5 and .40 at 1991.9; light to medium brown, low to medium grade oil shale with faint wavy and streaked bedding from 1994.9-1995.4; light olive brown low grade oil shale with wavy and streaked bedding from 1995.6-1997.4.

From	To	
1997.4	2005.0	Oil Shale, marly, light brown to buff, faint even bedding to massive, excellent competence, very low grade; several scattered light brown marly blebs with trace pyrite; several scattered dark brown asphaltic blebs.
2005.0	2008.5	Oil Shale, light to medium brown, faint streaked bedding, excellent competence, low to medium grade; light to medium brown marly blebs common; several scattered dark brown asphaltic blebs;.05 asphaltic bleb with associated wavy bedding at 2005.1.
2008.5	2011.0	Oil Shale, medium to dark gray brown, even bedding, poor competence, medium to high grade; several scattered shaly partings; slightly argillaceous.
2011.0	2013.1	Oil Shale, dark gray to brown to black, even bedding, fair to good competence, high grade.
2013.1	2015.1	Oil Shale, light to medium brown, even with trace wavy bedding, poor to fair competence, low grade; few scattered light brown marly blebs and streaks; few scattered dark gray pyrite blebs.
2015.1	2024.6	Oil Shale, dark brown to black, even with faint streaked bedding, poor competence, high to very high grade; medium brown low to medium grade oil shale from 2016.0-2017.5; several scattered dark brown asphaltic blebs and streaks; numerous asphaltic blebs from 2018.2-2019.1; poker chip partings zones common from 2019.6-2023.3; argillaceous oil shale with abundant poker chip disked and planar partings from 2022.1-2023.3.
2024.6	2035.4	Oil Shale, light brown to buff, even with trace wavy bedding, good competence, very low grade; marly; several scattered zones with light brownish gray tint; poker chip partings from 2034.4-2035.0; gradational contact.
2035.4	2043.6	Oil Shale, argillaceous, medium gray to brown, even bedding, very poor competence, low to medium grade; poker chip partings common; slightly bentonitic, greasy; numerous soft, bentonitic clay stringers and lamina from 2035.4-2037.0; several scattered light gray brown oil shale bands and stringers; gradational contact.
2043.6	2048.5	Oil Shale, light olive brown, even with trace irregular bedding, fair to good competence, low grade; few scattered marly blebs and streaks from 2046.0-2048.5; marly from 2046.5-2048.5; .15 zone of brittle fissile marlstone at 2045.9; numerous scattered medium brown granular analcitized tuffaceous blebs and stringers.
2048.5	2051.2	Oil Shale, light olive brown to light brown, streaked bedding, fair competence, low grade; numerous scattered light brown marly blebs and stringers; numerous scattered analcitized tuffaceous blebs; .10 brittle fissile marlstone band at 2050.5.
2051.2	2052.0	Oil Shale, light to medium olive brown, even with slightly wavy bedding, fair to good competence, medium grade.

From	To	
2052.0	2058.2	Oil Shale, light brown to light olive brown, faintly streaked bedding with trace even bedding, fair to good competence, low grade; light brown to tan very low grade oil shale with wavy bedding from 2052.0-2052.6; abundant scattered gray brown granular analcitized tuffaceous blebs and streaks with pyrite rims; trace scattered dark brown oil shale streaks and stringers; few scattered shaly partings with fossile casts.
2058.2	2071.7	Oil Shale, dark mahogany brown with scattered dark gray brown zones; even with trace irregular bedding, very poor competence, high to high grade; slightly argillaceous; dessication common; abundant shaly partings with gilsonite replaced fish fossils; numerous 85°-90° fractures with carbonaceous material; several scattered dark brown and light brown slightly asphaltic analcitized tuffaceous blebs with associated pyrite; .05 zone of white bentonitic clay stringers with orange oxidized staining; white translucent flaky mineral (Dawsonite ?) on several fractures; few scattered thin crumbley tectonic fractures. zones; abundant scattered gilsonite stringers and flakes; dark gray brown fairly argillaceous oil shale from 2067.5-2071.7; light brown to tan bands common at 2067.2, 2069.2 and 2071.2; 0.8 core loss from 2064.2-2065.0.
2071.7	2079.0	Oil Shale, medium olive brown with dark olive brown and dark mahogany brown banding, even bedding, very poor to poor competence, medium grade, slightly argillaceous, heavy dessication common; abundant shaly partings with gilsonite replaced fish fossils common; abundant scattered dark gray brown and black asphaltic analcitized tuff blebs with associated pyrite; numerous round light brown granular tuff blebs with pyrite rims from 2071.7-2072.8; few scattered gilsonite streaks; numerous scattered analcitized asphaltic tuff stringers and bands from 2075.8-2077.0; gradational contact.
2079.0	2082.9	Oil Shale, dark olive brown to black, even bedding, poor competence, high grade; slightly argillaceous; dessication common; numerous planar shaly partings with gilsonite fish fossils; few scattered light olive brown bands; bedding inclined 5°-15° from 2080.7-2081.5.
2082.9	2088.7	Oil Shale, light greenish brown with light brown to tan banding, streaked with even bedding, excellent competence; very low grade.
2088.7	2091.5	Oil Shale, light brown to tan, contorted and even bedding, excellent competence, very low grade; even bedding from 2090.7-2091.5.
2091.5	2097.0	Oil Shale, light brown, medium brown and light greenish brown banded; even, looped, wavy and streaked bedding, fair to good competence, low grade; few scattered analcitized tuff blebs and stringers; few scattered tan marly blebs, stringers and lamina; 90° fractures and few shaly partings from 2095.0-2097.0.

From	To	
2097.0	2100.4	Oil Shale, light brown and medium mahogany brown banded, even with looped bedding, poor competence, medium grade; numerous 90° fractures with calcite; few scattered shaly partings; trace scattered analcitized and asphaltic tuff blebs.
2100.4	2102.5	Oil Shale, dark gray brown, even bedding with trace looped and offset bedding, poor to fair competence, medium grade; heavy dessication common; slightly argillaceous; few scattered fractures with slicks; trace light olive brown banding; gradational contact.
2102.5	2107.0	Oil Shale, argillaceous, dark brownish gray to medium greenish brown, even bedding with offset bedding, very poor competence, very low grade; dessication common; abundant shaly "poker chip" partings; greasy and bentonitic; few scattered shaly fractures with slicks; few scattered tan oil shale bands; gradational contact.
2107.0	2125.1	Shale, bentonitic, light greenish gray brown, even with offset bedding, very poor competence, heavy dessication common; abundant "poker chip" partings, closed shaly fractures with offset bedding common; gilsonite fish fossils common on partings; several scattered gilsonite flakes and streaks; very argillaceous with numerous soft bentonitic light gray clay lamina and bands from 2114.5-2115.5; slightly to moderately calcareous; fair competence from 2118.4-2123.0.
2125.1	2135.7	Oil Shale, light brown, medium brown, medium gray to brown and light gray banding, even with trace offset bedding, poor competence, low grade; slightly argillaceous; slight dessication; numerous shaly partings; gradational contact.
2135.7	2148.9	Oil Shale, argillaceous, medium gray to brown with light brown bands, even bedding, very poor competence, very low to low grade; heavy dessication, greasy, bentonitic; "poker chip" partings common; grades to medium greenish gray bentonitic shale from 2141.9-2148.9; thin soft bentonitic clay stringers and lamina common.
2148.9	2152.7	Core loss (3.80')
2152.7	2175.0	Oil Shale, argillaceous, light to medium gray brown with greenish gray tint, even bedding, very poor to poor competence, very low grade, dessication common; greasy, bentonitic, "poker chip" partings common; numerous scattered thin soft bentonitic clay stringer and lamina; irregular bedding from 2166.0-2168.0; grades to light brownish gray, soft bentonitic shale from 2165.8-2173.0; 0.20 core loss from 2174.8-2175.0; gradational contact.
2175.0	2210.8	Shale, medium brownish gray, even bedding, very poor competence, trace kerogen; slightly bentonitic, moderately calcareous; abundant planar shaly partings; bentonitic zone with "poker chip" partings and several 90° fractures from 2183.5-2184.8; several scattered white calcite, lamina and stringer; grades to very low grade oil shale; few scattered oil shale stringers and lamina; few scattered 15°-30° shaly, slicks fractures; numerous scattered soft bentonitic clay lamina and stringers.

From	To	
2210.8	2217.7	Oil Shale, argillaceous, dark brownish gray and medium grayish brown with trace light gray brown; even with trace offset bedding, very poor to poor competence, very low to low grade, moderately calcareous, numerous planar and disked shaly partings; trace gilsonite fossils on partings, few scattered shaly fractures with slicks; gilsonite flakes and streaks common; from 2210.8-2213.0, very low grade, from 2213.0-2217.7 low grade.
2217.7	2222.7	Shale, bentonitic with interbedded marlstone bands, medium gray and light gray brown banded, even with wavy and irregular bedding, very poor to poor competence; numerous soft bentonitic clay stringers; medium brown medium grade oil shale with light brown bands from 2220.8-2221.4.
2222.7	2225.0	Oil Shale, dark gray brown with light brown banding, even with trace looped and offset bedding, very poor competence, low grade, argillaceous, abundant "poker chip" partings, 90° fractures continued from 2221.5 thru 2224.0.
2225.0	2228.0	Oil Shale, dark gray brown, even with faint streaked bedding, very poor competence, low to medium grade; moderately argillaceous; "poker chip" partings common; slight to moderate dessication; 2.20' long 90° fracture continued from above units from 2221.5-2226.2; gradational contact.
2228.0	2232.8	Oil Shale, light to medium gray brown, even bedding, very poor competence, very low to low grade; moderately argillaceous; slight dessication; "poker chip" partings common with trace slicks; trace gilsonite blebs; trace gilsonite replaced fossils on partings; few scattered low angle shaly fractures with slicks; gradational contact.
2232.8	2239.0	Oil Shale, light to medium gray brown with light brown, even with irregular bedding, very poor to poor competence, low grade; slightly argillaceous; slight dessication in part; numerous scattered partings with gilsonite and associated pyrite replaced fish fossils; light brown very low grade oil shale from 2235.7-2237.3; gradational contact.
2239.0	2241.1	Oil Shale, dark brown to black, even bedding, poor to fair competence, high grade; very slightly argillaceous; slight dessication; medium brown, medium grade oil shale from 2240.1-2240.6; several scattered partings.
2241.1	2249.1	Oil Shale, light to medium gray brown with light brown, even with trace streaked and irregular bedding, poor competence, low to medium grade; several scattered shaly partings with associated pyrite and gilsonite replaced fish fossils; several scattered dark green gray and black, associated pyrite and gilsonite streaks; .40 zone with light brown to buff irregular marly streaks at 2243.6; inclined bedding (5°-15°) from 2244.4-2245.0; few scattered dark brown asphaltic blebs and streaks from 2247.2-2249.1.

From	To	
2249.1	2256.0	Oil Shale, dark brown to black with dark gray brown, even bedding, fair to good competence, high grade; several scattered light brown oil shale bands and stringers from 2253.7-2254.7.
2256.0	2264.2	Oil Shale, light to medium brown, even with trace irregular bedding, very poor to poor competence, low to medium grade; planar shaly partings common; few scattered high angle fractures; from 2258.6-2260.5 numerous light brown soft bentonitic clay stringers and bands; light brown low grade oil shale from 2258.6-2259.0; dark green gray pyrite streaks at 2258.9; gradational contact.
2264.2	2272.7	Oil Shale, medium to dark brown, even bedding, poor to fair competence, medium to high grade; few scattered shaly partings; medium gray soft clay stringers common from 2267.6-2268.1 and scattered thru-out; gradational contact.
2272.7	2275.3	Oil Shale, dark brown to black, even with trace looped bedding, poor competence, high to very high grade; several scattered shaly partings some with slicks; .10 zone with abundant medium gray soft bentonitic clay stringers at 2273.1; trace gilsonite fish fossils on partings; gradational contact.
2275.3	2276.9	Oil Shale, medium brown, irregular with looped bedding, fair competence, medium grade.
2276.9	2282.2	Oil Shale, argillaceous with interbedded gray bentonitic shale, dark gray brown and medium gray banded, even with trace looped bedding, very poor competence, very low grade; gray shale from 2276.9-2277.4; 1.6 core loss from 2277.4-2279.0; light brown oil shale bands with even bedding .20 at 2280.2, .15 at 2281.0; trace gilsonite fossils on partings; numerous scattered short .05-.10 planar shaly fractures.
2282.2	2286.8	Oil Shale, dark brown to black, even with trace looped bedding, fair competence, very high grade; few shaly partings with trace gilsonite fossils; numerous white calcareous stringers from 2283.1-2283.6; buff, brittle massive tuff exuding sticky asphaltic resin from 2284.6-2285.0.
2286.8	2290.3	Oil Shale, dark gray brown, even bedding, very poor competence, low grade; slightly argillaceous; numerous poker chip partings with trace gilsonite fish fossils; trace scattered gilsonite flakes and stringers.
2290.3	2293.8	Oil Shale, dark mahogany brown with few light brown bands, even with trace looped and irregular bedding, fair to good competence, high to very high grade; fairly low density; few scattered shaly partings; few scattered dark greenish gray pyrite blebs.

From	To	
2293.8	2296.8	Oil Shale, dark brown to black, even with trace looped and irregular bedding, fair competence, very high grade; very low density; few scattered light brown bands and stringers; few planar shaly partings; few scattered greenish gray pyrite streaks and stringers; bedding inclined approximately 5° from 2294.9-2296.4; .15 light brown slightly marly, slightly calcareous lenticular band at 2295.5; .025 calcareous band at 2295.95; gradational contact.
2296.8	2299.5	Oil Shale, medium olive brown to medium mahogany brown, even with trace streaked bedding, excellent competence, high grade; few light gray pyrite blebs; trace gilsonite blebs.
2299.5	2301.4	Oil Shale, light brown, irregular bedding, good to excellent competence, medium grade; numerous small greenish gray pyrite blebs, streaks and stringers; few dark brown tuffaceous blebs with associated asphalt and pyrite from 2301.1-2301.4.
2301.4	2312.4	Oil Shale, medium mahogany brown to medium gray brown, even bedding, fair competence, medium to high grade; very slight dessication; slightly argillaceous with poker chip partings from 2304.0-2305.5; numerous scattered brown analcitized tuff blebs and stringers with associated pyrite and asphalt; dark brown to black fairly low density very high grade oil shale from 2307.0-2308.0 and 2309.2-2310.4; few dark gray pyrite blebs from 2301.4-2301.8 and 2308.4-2309.7; numerous scattered gilsonite flakes and streaks; medium bluish gray massive hard granular analcitized tuff with strong hydrocarbon smell from 2302.9-2303.2; few scattered light brown tuff stringers; light gray and brown tuff stringer at 2305.7.
2312.4	2328.2	Oil Shale, medium to dark gray brown, even bedding, poor competence, low grade; argillaceous, dessication common, abundant shaly partings; several 80°-90° fractures some with asphalt; trace gilsonite fossils on partings; few scattered brown asphaltic tuff stringers; gilsonite blebs and streaks common; white calcite stringers and sealed partings common from 2318.3-2318.7 and 2320.4-2320.8; numerous dark gray pyrite blebs and streaks from 2323.0-2328.2; numerous white non-calcareous streaks and stringers from 2324.7-2326.2.
2328.2	2330.0	Oil Shale, light olive brown, irregular with trace even and looped bedding, fair competence, low grade; several scattered light to medium gray pyrite streaks, stringers and blebs.
2330.0	2337.7	Oil Shale, dark gray brown to black, even bedding, fair to good competence, very high grade; slightly argillaceous with few planar shaly partings; very slight dessication; fairly low density; trace scattered gilsonite flakes and streaks.
2337.7	2341.8	Oil Shale, medium and dark brown with light brown, even with irregular and streaked bedding, fair to good competence, medium grade; several scattered dark green gray pyrite streaks and blebs; streaked bedding from 2340.2-2341.8; .30 light brown granular asphaltic tuff bed at 1341.5.

From	To	
2341.8	2344.0	Oil Shale, dark gray brown, even bedding, very poor competence, low to medium grade; abundant poker chip partings; light brown granular tuffaceous stringer at 2342.2; .10 light brown asphalt marly band at 2343.6.
2344.0	2348.3	Oil Shale, light gray brown, even bedding, very poor competence, low grade, slightly argillaceous, several shaly partings; 85° fractures with heavy asphalt from 2344.0-2345.0; light orange brown marly band with asphalt blebs .30 at 2345.8; trace scattered gilsonite flakes; gradational contact.
2348.3	2352.4	Oil Shale, dark gray brown to black, even with trace looped and irregular bedding, poor competence, medium to high grade; dessication common; slightly argillaceous; several scattered gilsonite flakes and streaks; several scattered shaly partings with gilsonite fossils casts; gradational contact.
2352.4	2355.3	Oil Shale, dark gray brown, even bedding, very poor competence, very low grade; argillaceous; abundant poker chip partings, several shaly fractures with slicks and asphalt.
2355.3	2358.1	Oil Shale, dark brown with light olive brown and tan banding, even with looped bedding, poor to fair competence, medium grade; thin light gray bentonitic clay stringer at 2355.3; .30 massive light brown and buff asphaltic dolomitic band with few small vugs at 2355.6.
2358.1	2363.2	Oil Shale, dark brown to dark gray brown and black, even bedding with trace looped, poor competence, medium to high grade; slightly argillaceous; numerous scattered shaly partings; few gilsonite fish fossils on partings; few scattered gilsonite flakes and streaks; moderate dessication; thin orange bentonitic clay stringers at 2358.3 and 2358.4; dark brown asphaltic tuff stringers at 2360.5, 2360.7, 2361.7, and 2362.5.
2363.2	2365.0	Oil Shale, dark brown to black with tan banding, even with looped bedding, fair competence, high grade; few shaly partings with trace pyrite replaced fossils; trace gilsonite streaks; gradational contact.
2365.0	2370.8	Oil Shale, medium brown and dark gray brown to black, even, looped and irregular bedding, fair competence, medium to high grade; few shaly partings; slight dessication; very slightly argillaceous; few thin dark green gray pyrite streaks; few asphalt and pyrite blebs from 2369.0-2369.4.
2370.8	2372.4	Oil Shale, dark gray brown to black, even bedding, poor competence, low to medium grade; moderately argillaceous, moderate dessication, several planar shaly partings; several white calcareous stringers from 2371.0-2371.5; few scattered pyrite streaks.
2372.4	2376.2	Oil Shale, light to medium olive brown, streaked with trace irregular bedding, fair to good competence, medium grade.

From	To	
2376.2	2381.9	Oil Shale, medium gray brown, even with trace looped bedding, poor to fair competence, low grade; slightly argillaceous, slight dessication; several scattered shaly partings with gilsonite fossils, abundant white calcareous streaks and blebs from 2376.9-2377.4; blue gray soft bentonitic clay stringers at 2377.6, and 2378.8; scattered gilsonite streaks and blebs common.
2381.9	2388.1	Shale, bentonitic, calcareous, medium gray with medium gray brown, even bedding; very poor competence, trace kerogen; dessication common, abundant planar and disked shaly partings; numerous slicked shaly fractures with trace asphalt; numerous interbedded medium gray brown oil shale bands and lamina.
2388.1	2390.9	Oil Shale, dark brown to black, even bedding, poor competence, medium to high grade; medium to dark gray brown with trace tan banding, slightly argillaceous from 2388.0-2388.5; several shaly partings from 2388.0-2388.8; numerous scattered gilsonite blebs and streaks; .20 zone of fine hairline pyrite stringers at 2389.7.
2390.9	2393.8	Shale, bentonitic, calcareous, with interbedded argillaceous oil shale, medium gray and medium brown, even bedding, very poor competence, very low grade; dessication common; abundant poker chip partings; several scattered shaly fractures with slicks; several 85°-90° fractures with asphalt from 2390.9-2391.7; gilsonite blebs and streaks common; several scattered light brown marly stringers; several gilsonite fossils on partings; gradational contact.
2393.8	2394.8	Oil Shale, argillaceous, dark gray brown, even bedding, poor competence, very low grade, several scattered shaly partings with gilsonite fish fossils; abundant scattered gilsonite streaks; gradational contact.
2394.8	2397.2	Oil Shale, medium to dark brown with light brown banding, even bedding, fair competence, medium to high grade, slightly argillaceous; gilsonite streaks common; few shaly partings with gilsonite fish fossils, numerous medium brown and light apple green bentonitic clay bands and stringers from 2395.9-2394.3.
2397.2	2398.5	Oil Shale, argillaceous, dark gray brown with light gray banding, even with trace irregular bedding, poor competence, low grade; abundant gilsonite streaks; numerous planar shaly partings, some with gilsonite fish fossils; moderate dessication.
2398.5	2403.9	Shale, bentonitic, medium gray and medium brownish gray, even with trace offset and irregular bedding, very poor competence, trace kerogen; poker chip partings common; dessication common, several scattered 30° asphaltic fractures from 2399.5-2400.0; medium to dark olive brown oil shale bands and lamina common; several scattered gilsonite streaks and blebs; gilsonite fish fossils common on partings; few scattered dark greenish gray pyrite stringers.

From	To	
2403.9	2407.2	Oil Shale, argillaceous, light olive brown to medium gray brown, even bedding, very poor competence, very low grade; greasy and bentonitic; abundant poker chip partings; dessication common; numerous dark brown gilsonite stringers and blebs from 2403.9-2404.1; very soft crumbly very argillaceous from 2405.8-2406.5; thin light orange stringer at 2406.3.
2407.2	2410.9	Oil Shale, medium brown, medium gray brown and dark brown black; even with looped bedding, fair competence, medium to high grade; dark brown black high grade oil shale from 2407.8-2409.8; few scattered buff granular tuff blebs from 2407.9-2408.2 and 2409.2-2409.3; numerous large black gilsonite lenses and streaks from 2409.1-2410.0; .10 dark apple green pyrite and asphalt tuff band at 2409.4; trace scattered slicks and polished fractures with asphalt; gradational contact.
2410.9	2414.1	Oil Shale, argillaceous, light olive brown to light greenish brown; even bedding, poor to fair competence, very low grade, greasy, bentonitic; dessication common; numerous shaly partings; few scattered slicks and polished fractures; dark green gray pyrite stringers and blebs common.
2414.1	2419.4	Oil Shale, slightly argillaceous; dark brown and medium greenish brown, even with trace streaked and looped bedding, poor to fair competence; low to medium grade; grades to medium green gray shale with poker chip partings from 2415.0-2415.7; several scattered medium green gray pyrite blebs and stringers; few scattered partings with dark green gray pyrite blebs; several scattered dark brown gilsonite lenses, stringers, and streaks; gradational contact.
2419.4	2423.1	Oil Shale, argillaceous and shale interbedded; light olive brown, tan and light green gray; even with offset and trace irregular bedding; very poor to poor competence; very low grade; greasy; bentonitic; dessication common; abundant poker chip partings; several scattered tan marly bands.
2423.1	2427.9	Oil Shale, dark brown and dark gray brown, even bedding, poor to fair competence, medium grade; argillaceous, several shaly partings with gilsonite fish fossils; few scattered tan and light olive brown oil shale bands; abundant gilsonite flakes, streaks and stringers; light gray bentonitic stringer at 2424.8; large gilsonite blebs and streaks common from 2426.3-2427.8; buff asphaltic dolomitic bands at 2426.9 and 2427.4.
2427.9	2432.1	Shale, light and medium green gray; even and irregular bedding, very poor to poor competence, trace kerogen; several light brown irregular beds and stringers from 2427.9-2429.9, very bentonitic and greasy; shaly poker chip partings common with trace scattered gilsonite fossils; trace gilsonite stringers and streaks.

From	To	
2432.1	2435.7	Oil Shale, medium brown to dark olive brown, even bedding, fair competence, medium to high grade; abundant very small gilsonite flakes and streaks; large dark brown asphaltic pod .05 at 2434.4; abundant finely disseminated pyrite stringers on core and partings; gradational contact.
2435.7	2439.4	Oil Shale, light olive brown and tan banded; even bedding, poor competence, very low grade; slightly bentonitic; planar shaly partings common with finely disseminated pyrite; dessication common; several fractures with asphalt, numerous medium green gray pyrite stringers.
2439.4	2441.1	Oil Shale, medium and dark brown, irregular to streaked bedding, fair competence, medium to high grade.
2441.1	2444.2	Oil Shale, dark brown to black, even with trace streaked and irregular bedding, good to excellent competence from 2441.1-2442.7, poor competence from 2442.7-2444.2; high grade; abundant pyrite stringers and blebs; several scattered gilsonite blebs; .40 core loss from 2443.1-2443.5; gradational contact.
2444.2	2445.9	Oil Shale, medium brown, even and looped bedding, poor competence, very low grade, argillaceous, dessication common, slightly bentonitic; abundant shaly partings; slightly greasy; gradational contact.
2445.9	2447.4	Oil Shale, dark brown, even to irregular bedding, good to excellent competence, high grade, slightly argillaceous, abundant irregular pyrite streaks; trace gilsonite streaks; gradational contact.
2447.4	2448.9	Oil Shale, dark gray brown, even bedding, fair competence, medium grade, slightly argillaceous, abundant to irregular pyrite stringers; few scattered gilsonite streaks; gilsonite fossils and finely disseminated pyrite stringers common on few shaly partings.
2448.9	2450.4	Oil Shale, dark brown to black, even with faint streaked and irregular bedding; good competence; high grade, slightly low density; abundant pyrite stringers and streaks; gradational contact.
2450.4	2462.3	Oil Shale, medium brown with dark brownish black banding, even bedding, fair competence, medium grade; slightly argillaceous; few shaly partings; few poker chip zones; pyrite stringers and blebs common; from 2453.5-2454.8 medium to high grade oil shale.
2462.3	2464.2	Oil Shale, dark gray brown to black, even bedding, good competence, medium to high grade; very slightly argillaceous, gradational contact.
2464.2	2471.4	Shale, bentonitic, dark brownish gray, even bedding, very poor competence; numerous shaly partings; few scattered fractures with slicks and trace asphalt; slightly greasy; trace gilsonite; trace irregular bedding; gradational contact.

From	To	
2471.4	2475.3	Oil Shale, argillaceous, dark gray brown, even bedding, very poor competence, very low grade, abundant shaly partings, slightly greasy; slight dessication; gradational contact.
2475.3	2478.3	Shale, medium to dark brownish gray, even bedding, very poor competence, trace kerogen, greasy, bentonitic, numerous shaly partings; very irregular fractures with heavy sticky asphalt coating with hydrocarbon smell .30 long at 2477.5; light olive brown band .30 at 2477.4; gradational contact; trace gilsonite streaks and trace gilsonite replaced fish fossils on shaly partings.
2478.3	2480.8	Oil Shale, dark gray brown, even with trace irregular bedding, poor competence, low to medium grade; several shaly partings with trace gilsonite fish fossils; few scattered fractures with slicks; light olive brown from 2480.3-2480.6; .20 light tan dolomitic band with 90° asphalt sealed fractures at 2480.6.
2480.8	2485.8	Shale, dark green gray with light olive brown to tan marly bands, even bedding with few nearly massive zones, very poor competence; greasy, bentonitic; gilsonite fossils common on poker chip partings; dessication common; numerous scattered gilsonite streaks.
2485.8	2488.3	Oil Shale, dark gray brown, tan and dark brownish gray, banded, even with trace irregular bedding, poor to fair competence, very low to low grade; trace brown asphaltic tuff blebs at 2486.5; irregular green gray pyrite stringer at 2487.4; trace asphaltic blebs at 2487.7.
2488.3	2489.1	Shale, dark brownish gray, even bedding, very poor to poor competence, slight to moderate calcareous, fairly hard; large gilsonite stringer at 2488.4.
2489.1	2490.0	Oil Shale, light olive brown with dark olive brown banding, even bedding, fair to good competence, low grade; several scattered asphaltic blebs and streaks.
	2490.0	Total Depth