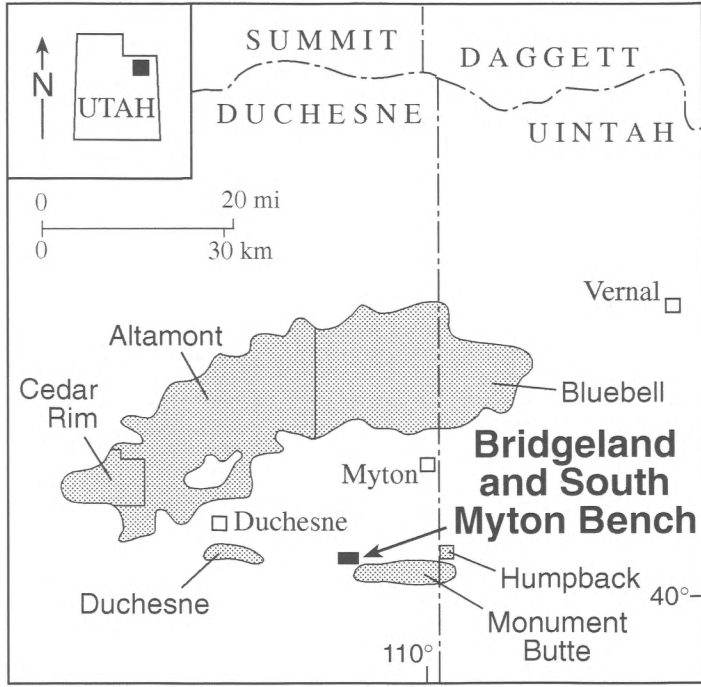


BRIDGELAND AND SOUTH MYTON BENCH OIL FIELDS,
T. 4 S., R. 2 AND 3 W., UBM
DUCHESE COUNTY, UTAH
by
Craig D. Morgan
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 Oil and Gas Field Study 17
UTAH GEOLOGICAL SURVEY
a division of
UTAH DEPARTMENT OF NATURAL RESOURCES

INTRODUCTION

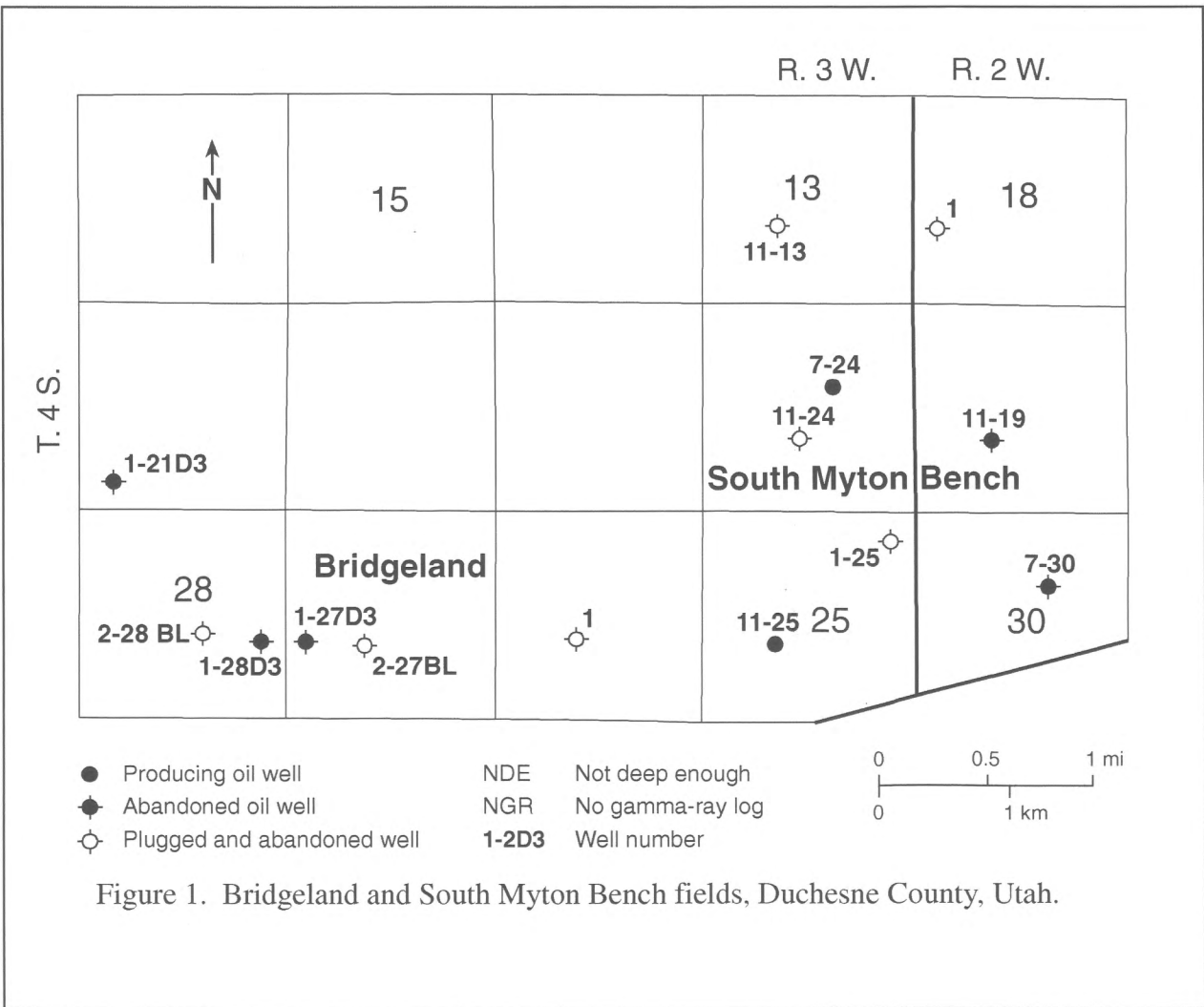
Bridgeland (abandoned) and South Myton Bench (active) fields are located in T. 4 S., R. 2 and 3 W., Uinta Base Line and Meridian, Duchesne County (figure 1). Hydrocarbons were produced from the Tertiary Wasatch and Green River Formations at Bridgeland field but only the Green River Formation is productive at South Myton Bench field. The Green River reservoir sandstones were deposited in fluvial-deltaic, interdeltaic, to shallow-lacustrine environments. The Wasatch reservoir sandstones are fluvial-channel deposits.

Analysis of geophysical well logs from Bridgeland and South Myton Bench fields identified several beds in the lower Green River Formation (Garden Gulch, Douglas Creek, and Castle Peak Members) that may still have hydrocarbon potential. The upper Green River and Wasatch Formation potential was not investigated.

TerraTek Incorporated is conducting a study in the Duchesne - Monument Butte area titled *Advanced Fracture Modeling in the Uinta Basin (Utah) for Optimized Primary and Secondary Recovery*. The Utah Geological Survey, under a subcontract to TerraTek Inc., compiled and mapped basic oil-well data from the Duchesne, South Myton Bench, and Bridgeland fields, as well as the Humpback Unit. The data will be used by TerraTek Inc. in developing their geologic characterization of the area. The Bridgeland and South Myton Bench fields are east of, and on trend with, the Duchesne fault zone, a major focus of the TerraTek Inc. study. The Bridgeland and South Myton Bench fields are located about midway between the Duchesne fault zone and Humpback Unit where Balcron Oil Division will be collecting core in cooperation with TerraTek Inc.

HYDROCARBON PRODUCTION

Bridgeland field was first placed into production in 1983 and was abandoned in August 1989. A total of 75,358 barrels of oil (BO) [10,550.1 MT] and 30,717 thousand cubic feet of gas [MCFG] 869,810 m³) were produced from Bridgeland field. South Myton Bench field was first placed into production in 1984. As of November 1996, there were two active wells in the South Myton Bench field that produced intermittently. A total of 62,078 BO (8,690.9 MT) and 189,871



MCFG (5,376,580 m³) have been produced from South Myton Bench field. All production data in this report are from the records of the Utah Division of Oil, Gas and Mining.

STRUCTURE

A structure contour map of the top of the Douglas Creek Member of the Green River Formation was constructed using tops picked from geophysical well logs. The structural dip is about 400 feet/mile (196.3 m/km) northeast into the Uinta Basin (figure 2). Faulting was not identified in the correlations of the well logs at the Douglas Creek horizon. The highly complex, heterogeneous character of the Green River Formation makes it very difficult to identify faults that have displacements of a few feet to a few tens of feet.

Oleson (1986) interpreted a fault below the "C" marker (about 200 feet [61 m] below the top of the Douglas Creek Member) in the number 1 well (section 18) and 11-13 well. Oleson determined that about 50 feet (15 m) of section was displaced by a normal fault, trending east to west with the downthrown side to the north. Although there is no surface faulting in the area, Olsen felt that the fault was related to the Duchesne fault zone.

Ballou (1993) states that the 1-27D3 was drilled to investigate the possibility of fractured reservoirs on trend with the east-west-trending Duchesne fault zone, in the Bridgeland field. The operator did not report encountering any faults in this well.

BRIDGELAND FIELD DEVELOPMENT HISTORY

The Bridgeland field was discovered in 1982 with the completion of the 1-28D3 well in the Green River Formation. The completion of the 1-27D3 in 1984 established production from the deeper Wasatch Formation. The 1-27D3 well was later recompleted in the upper Green River. Most of the hydrocarbons produced at Bridgeland field have come from the upper Green River (table 1).

Table 1. Cumulative hydrocarbon production from Bridgeland field.

Well	Formation	Oil Produced (BO)	Gas Produced (MCFG)
1-27D3	upper Green River	195	864
1-28D3	upper Green River	55,126	9,189
1-21D3	lower Green River	9,114	13,467
1-27D3	Wasatch	10,603	6,357

SOUTH MYTON BENCH FIELD DEVELOPMENT HISTORY

South Myton Bench field was discovered in 1983 with the completion of the 11-25 well in the Green River Formation. There are currently two active wells that produce intermittently and two abandoned oil wells. The hydrocarbons produced at South Myton Bench field have come from the lower Green River. The 7-30 well was completed in both the upper and lower Green River but never produced (table 2).

Table 2. Cumulative hydrocarbon production from South Myton Bench field, as of November 30, 1996.

Well	Formation	Oil Produced (BO)	Gas Produced (MCFG)	Status
7-30	upper and lower Green River	0	0	abandoned
11-19	lower Green River	6,043	21,903	abandoned
7-24	lower Green River	53,434	159,911	active ¹
11-25	lower Green River	2,621	8,057	active ²

¹November 1996 monthly production: 4 days, 0 BO, 80 MCFG

²November 1996 monthly production: 1 day, 5 BO, 0 MCFG

LOWER GREEN RIVER POTENTIAL

Hydrocarbons have been produced from the lower Green River Formation at Bridgeland and South Myton Bench fields. The lower Green River is the objective of the numerous water-flood units developed in the Monument Butte area (T. 8 and 9 S., R. 16 through 19 E., SLBM) located two miles south of South Myton Bench. Based on correlation and analysis of geophysical well logs the Bridgeland and South Myton Bench area may contain additional potential for exploitation of hydrocarbons from the lower Green River. In the following discussion bed boundaries were defined using a 75 API unit gamma-ray cut-off; density porosity was calculated using a matrix density of 2.68 grams/cubic centimeters. The following sandstones are believed to have areas with hydrocarbon potential that have not been exploited, based on 40-acre (16.2 ha) well spacing.

Upper Y-2 Sandstone

The upper Y-2 sandstone was perforated in the 7-30 well but was never produced. In the 11-19 well the upper Y-2 sandstone is at a drill depth of 4,847 feet (1,478.3 m), is 16 feet (4.9 m) thick with a maximum density porosity of 16 percent, and more than 200 ohm-meters resistivity (figure 3). The upper Y-2 sandstone is 12 feet (3.7 m) thick in the 11-24 well (figure 4) with density porosity of 12 to 18 percent. Using a minimum 6-foot (1.8-m) thickness, the upper Y-2 sandstone has hydrocarbon potential in the SE1/4 section 24 (T. 4 S., R. 3 W.), E1/2 section 20 (not shown), S1/2 section 19, and N1/2 section 30 (T. 4 S., R. 2 W.).

Lower Y-2 Sandstone

The lower Y-2 sandstone was perforated in the 7-30 well but was never produced. In the 11-19 well the lower Y-2 sandstone is at a drill depth of 4,881 feet (1,488.7 m), is 8 feet (2.4 m) thick with a maximum density porosity of 20 percent, and more than 40 ohm-meters resistivity (figure 3). The lower Y-2 sandstone is 6 feet (4.9 m) thick in the 11-24 and 7-30 wells (figure 5). In the 11-24 well the lower Y-2 sandstone has 13 to 14 percent density porosity and 150 ohm-meters resistivity. Porosity of the lower Y-2 sandstone in the 7-30 well cannot be determined due to rugose hole conditions. Using a minimum 6-foot (1.8-m) thickness, the lower Y-2 sandstone has hydrocarbon potential in the SE1/4 section 24 (T. 4 S., R. 3 W.), SW1/4 section 19, and NW1/4NE1/4 section 30 (T. 4 S., R. 2 W.).

Y-6 Sandstone

The Y-6 sandstone bed was perforated in the 11-19 well. Based on the geophysical well logs and comparison with similar beds in the Monument Butte area it is surprising that the 11-19 well didn't produce a greater volume of hydrocarbons. In the 11-19 well the Y-6 sandstone is at a drill depth of 5,263 feet (1,605.2 m), is 9 feet (2.7 m) thick with a maximum density porosity of 15 percent, and has resistivity from 150 to more than 200 ohm-meters (figure 3). In the 1-25 well the Y-6 sandstone is 16 feet (4.9 m) thick (figure 6) with a maximum density porosity of 7 percent, and 70 ohm-meters resistivity. Using a minimum 6-foot (1.8-m) thickness, the Y-6 sandstone has hydrocarbon potential in the SE1/4 section 24 and NE1/4 section 25 (T. 4 S., R. 3 W.), SW1/4 section 19 and NW1/4 section 30 (T. 4 S., R. 2 W.). The hydrocarbon potential of the Y-6 sandstone may be limited by the small areal distribution and low porosity of the bed.

R-1 Sandstone

The R-1 and several beds in the Castle Peak Member of the Green River Formation are perforated in the 11-25 well. In the 11-19 well the R-1 sandstone is at a drill depth of 5,411 feet (1,650.4 m), is 8 feet (2.4 m) thick, with a maximum density porosity of 13 percent, and 70 to more than 100 ohm-meters resistivity (figure 3). In the 11-24 and 1-25 wells, porosity of the R-1 sandstone is generally less than 10 percent. In the 1-27D3 well, the R-1 sandstone is 14 feet (4.3 m) thick (figure 7) with density porosity of 12 to 16 percent, and 35 to 50 ohm-meters resistivity. The R-1 sandstone may be a poor objective in the South Myton Bench field due to low porosity, but has hydrocarbon potential in the Bridgeland field area (sections 27 and 28, T. 4 S., R. 3 W.).

R-5 Sandstone

The R-5 and other sandstone beds are perforated in the 7-30 and the 1-21D3 wells. In the 11-19 well the R-5 sandstone is at a drill depth of 5,564 feet (1,697.0 m), is 13 feet (3.9 m) thick with a maximum density porosity of 13 percent, and 125 to more than 200 ohm-meters resistivity (figure 3). Although the R-5 sandstone is more than 6 feet (1.8 m) thick in the 11-24, 1-25, and 1-27D3 wells (figure 8), density porosity is generally less than 10 percent. Therefore, the hydrocarbon potential of the R-5 sandstone may be limited to section 19 (T. 4 S., R. 2 W.), although additional drilling could find good porosity in the SE1/4 section 24 (T. 4 S., R. 3 W.) along the trend of the bed.

G-4 Sandstone

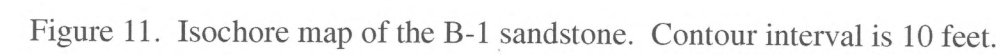
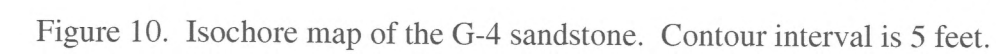
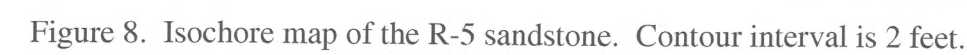
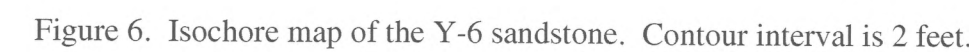
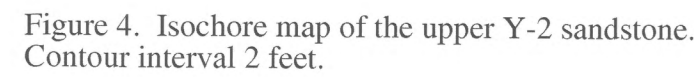
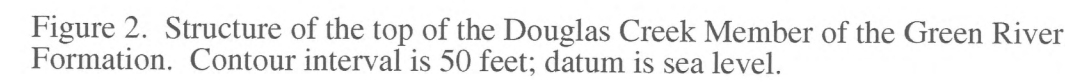
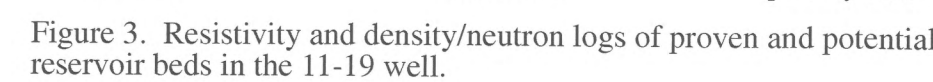
The G-4 and B-1 sandstone beds are perforated in the 7-24 well. In the 7-24 well the G-4 sandstone is at a drill depth of 5,982 feet (1,824.5 m), is 20 feet (6.1 m) thick with density porosity of 18 percent, and 90 to 150 ohm-meters resistivity (figure 9). Although the G-4 sandstone is more than 6 feet (1.8 m) thick in the 11-19, 7-30, and 1-27D3 wells (figure 10), density porosity is generally less than 10 percent. In the 1-21D3 well the G-4 sandstone is 9 feet (2.7 m) thick with density porosity of 10 to 16 percent, and 30 ohm-meters resistivity. Porosity in the G-4 sandstone appears to be developed only in portions of the bed. Therefore, the hydrocarbon potential of the G-4 sandstone cannot be determined until additional drilling occurs in the area.

B-1 Sandstone

In the 7-24 well the B-1 sandstone is at a drill depth of 6,411 feet (1,955.4 m), is 50 feet (15.3 m) thick with density porosity of 12 percent (over 34 feet [10.4 m]) and 25 to 70 ohm-meters resistivity (figure 9). In the 11-24 well the B-1 sandstone is 13 feet (3.9 m) thick (figure 11); a 9-foot (2.7-m) section of the B-1 has 10 percent or more density porosity with a maximum of 13 percent, and 32 ohm-meters resistivity. The B-1 sandstone appears to be a very limited reservoir.

CONCLUSIONS

Preliminary analysis of geophysical well logs and isochore mapping of potential reservoir beds show that good hydrocarbon potential exists in the Bridgeland and South Myton Bench area. The analysis did not include permeability data or oil-saturation calculations. The lower Green River is the objective of the many water-flood units being actively developed in the Monument Butte area two miles (3.2 km) to the south. Several beds in the lower Green River Formation have porosity and shows of hydrocarbons but have not been fully exploited in the Bridgeland and South Myton Bench area. The Bridgeland and South Myton Bench area has good potential for development drilling and eventually water flooding of the lower Green River.



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