UTELAND BUTTE CORE ANALYSIS

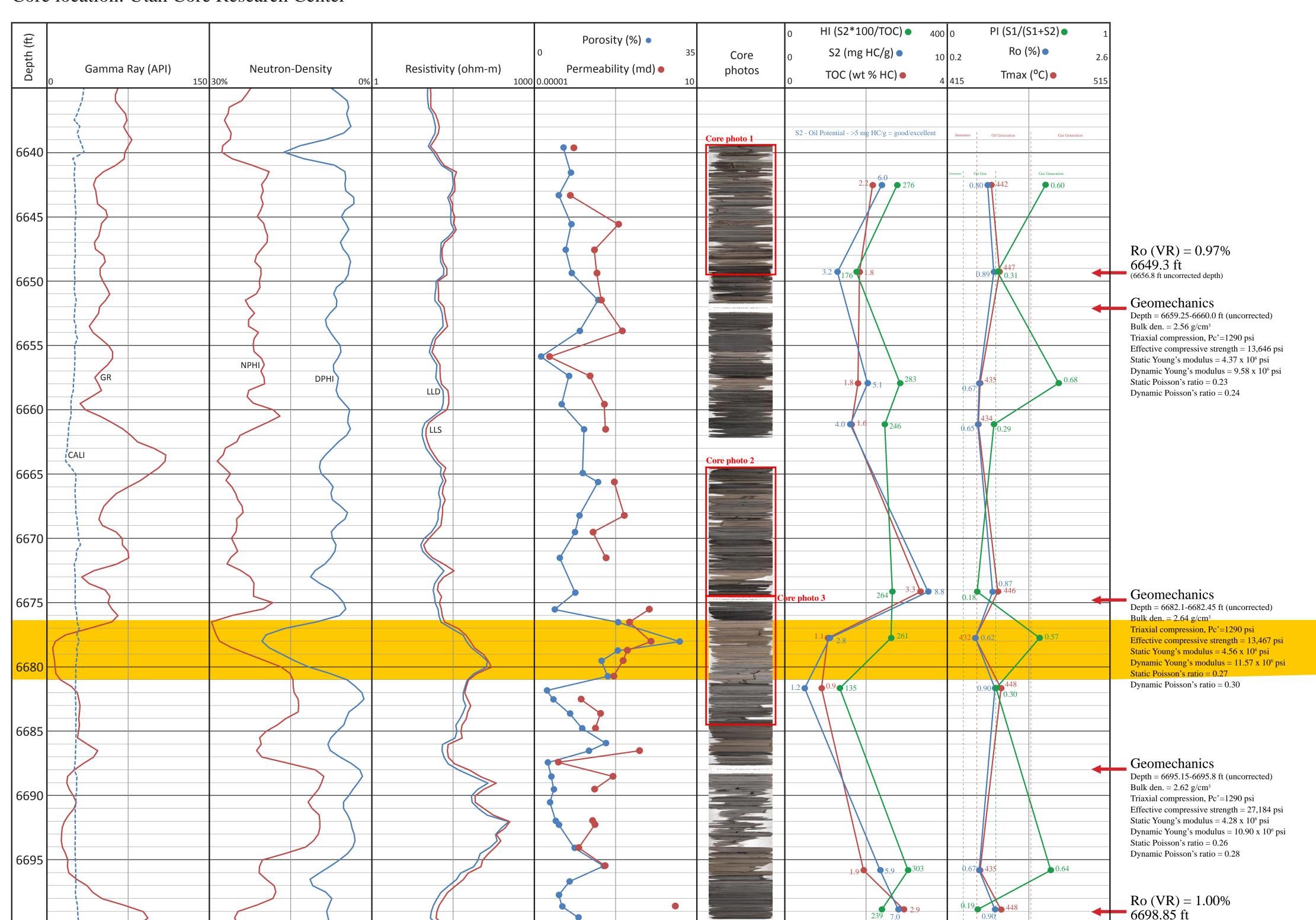
Several companies have made their Uteland Butte cores available to UGS for this study. This will allow for a comprehensive, regional evaluation of the study interval with a focus on facies characterization, changing depositional environments, and "sweet spot" mapping. Each core has been (or will be) analyzed in detail and compared to other cores from similar intervals across the basin. Highlighted in orange below is the main target interval consisting of a highly porous light to dark tan dolomite, ranging in thickness from 4 to 8 feet. Future research will include detailed core descriptions (including mineralogy, thin sections, SEM, elemental analysis, etc.), additional geochemical analysis (RockEval, vitrinite reflectance, etc.), and additional geomechanical analysis.

Well name: 14-1-46

Operator: Bill Barrett Corp.

API: 4301334113
Location: T4S, R6W, Sec. 1, Duchesne County, 3

Location: T4S, R6W, Sec. 1, Duchesne County, UTM E 541444, UTM N 4445336 Cored interval: 6647-6669.7, 6672-6707 ft (core shifted up ~7.5 ft to match logs) Core location: Utah Core Research Center





Typical interbedded dolomite (tan) and shale (darker grey) of the Uteland Butte Member of the Green River Formation. Limestones (see photo at right) are medium to dark grey, mudstone to packstone, argillaceous, and contain abundant pelecyopods, gastropods, and ostracods. Near vertical fractures are common, but typically restricted to individual beds or small zones.

Formation.
Soundant vidual beds

Ostracodal grainstone Carrier bed??

Horizontal drilling target ?? (yellow of Dolomite, ~4.5 feet thick

Horizontal drilling target ?? (yellow outline)
Dolomite, ~4.5 feet thick
15-30% porosity, low permeability

Mixed Type II/III
kerogen

6650.1 ft —
6650.3 ft —
6656.8 ft —
6656.8 ft —
66689.2 ft —
6689.2 ft —
66

Pseudo Van Krevelen Plot (Data source: Bill Barrett Corp.)

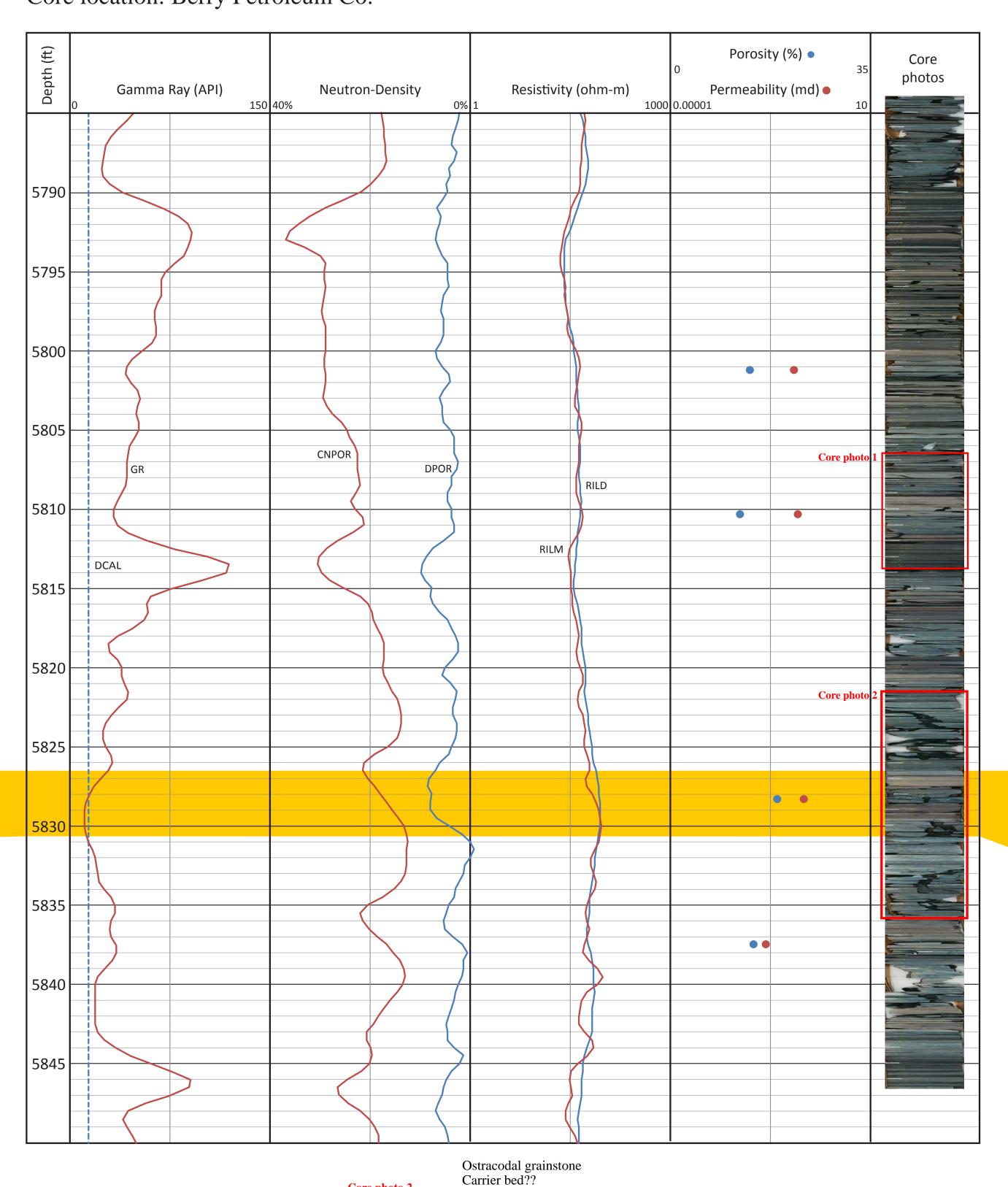
0 20 40 60 80 100 120 140 160 180 200

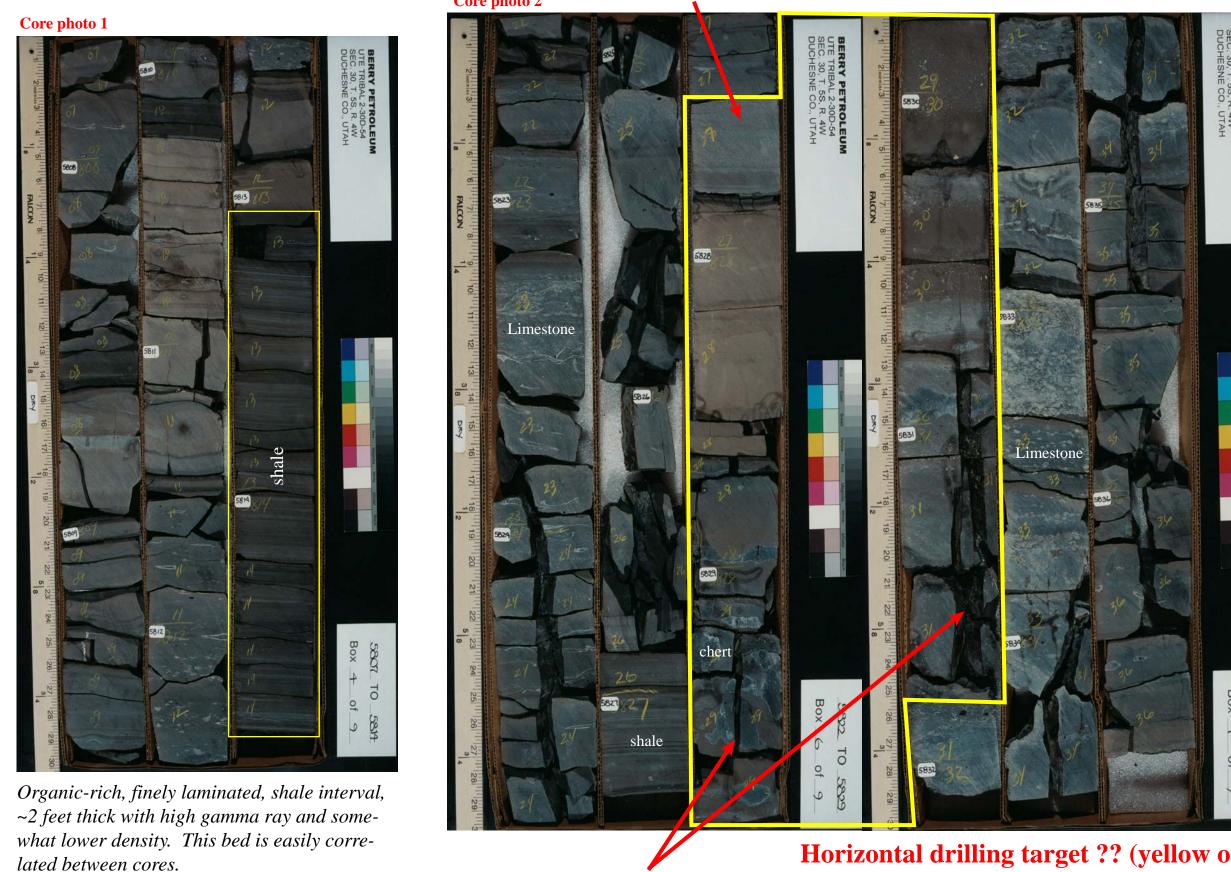
Oxygen index (mg CO₂/g TOC)

Well name: UT 2-30D-54

Operator: Berry Petroleum Co. (LINN Energy) API: 4301332894

Location: T5S, R4W, Sec. 30, Duchesne County, UTM E 553238, UTM N 4430434 Cored interval: 5785-5847 ft (core shifted up ~1 ft to match logs) Core location: Berry Petroleum Co.





Fractures common,

15-30% porosity, low permeability

many oil stained

CONCLUSIONS

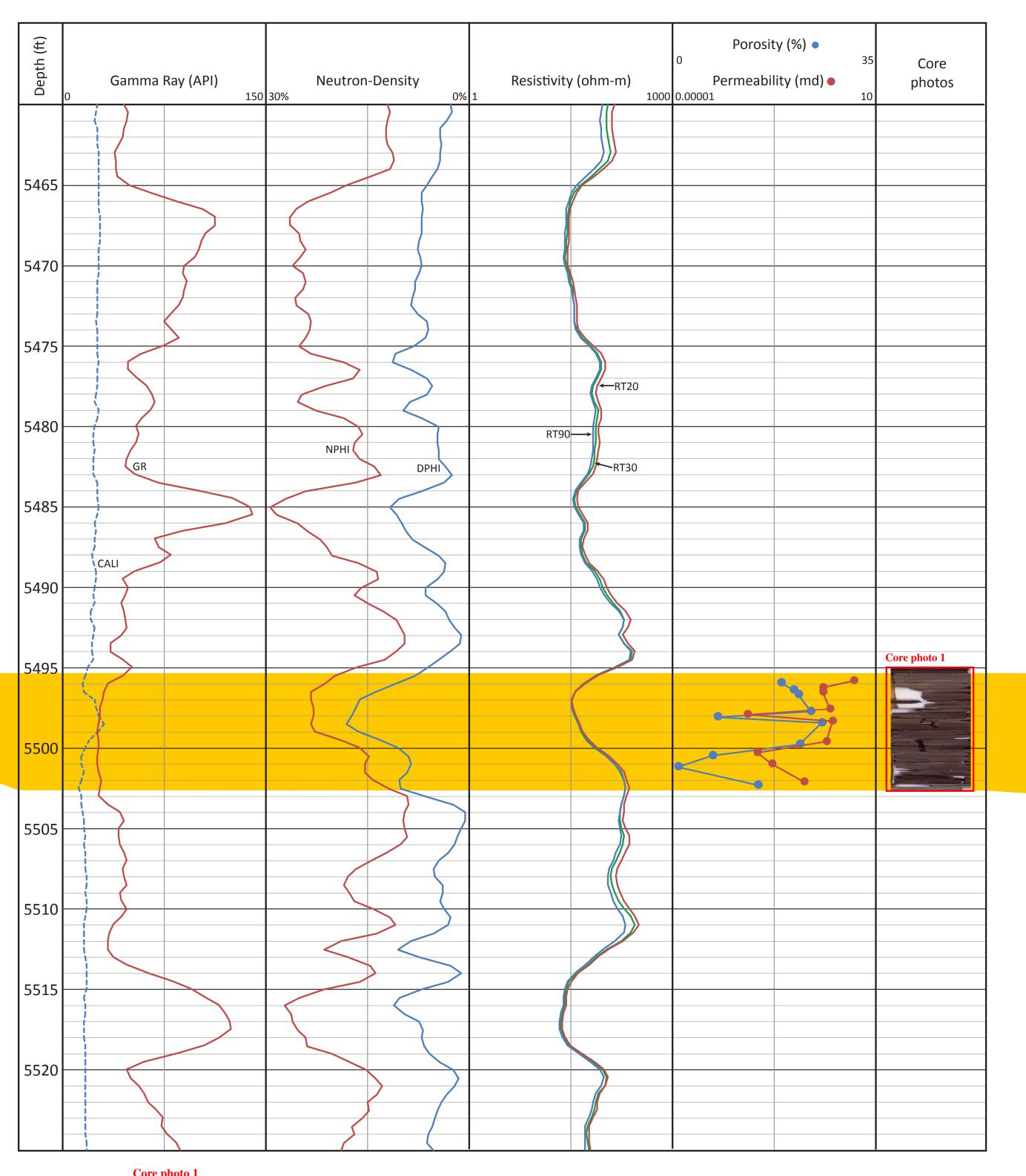
- The Uteland Butte is laterally extensive across the Uinta Basin, but questions remain as to how much of the unit has hydrocarbon production potential.
- The Uteland Butte is composed of interbedded organic-rich limestone, shale, and dolomite, often in regular shallowing upward cycles.
- Porosities in the thin dolomite intervals are very high, between 15 and 30%, but permeability is very low, unless fractures are present.
- Most fractures in the Uteland Butte are near-vertical and often isolated to individual beds.
- TOC values average 1.9% in the northwestern Bill Barrett core (with a high of 3.3%) and average 5.1% in the southern QEP core (with a high of 10.3%).
- Geochemistry data indicate that the mixed type II/III kerogen is mostly in the oil generation window.
- Currently, the most productive area of the Uteland Butte is in the central basin overpressured zone.
- Subsequent research will focus on well completion strategies to help unlock Uteland Butte production outside the overpressure zone.

Well name: GD 16G-35-9-15

Operator: QEP Resources API: 4301333833

Location: T9S, R15E, Sec. 35, Duchesne County, UTM E 568983, UTM N 4426024 Cored interval: 5497-5504.7 ft (core shifted up ~2 ft to match logs)

Core location: QEP Resources





Well name: GD 1G-34-9-15

Operator: QEP Resources API: 4301333827

Location: T9S, R15E, Sec. 34, Duchesne County, UTM E 567309, UTM N 4427321

Cored interval: 5850-5870, 5875-5883.3, 5892-5900.6 ft (core shifted down ~5 ft to match logs)

Core location: QEP Resources

