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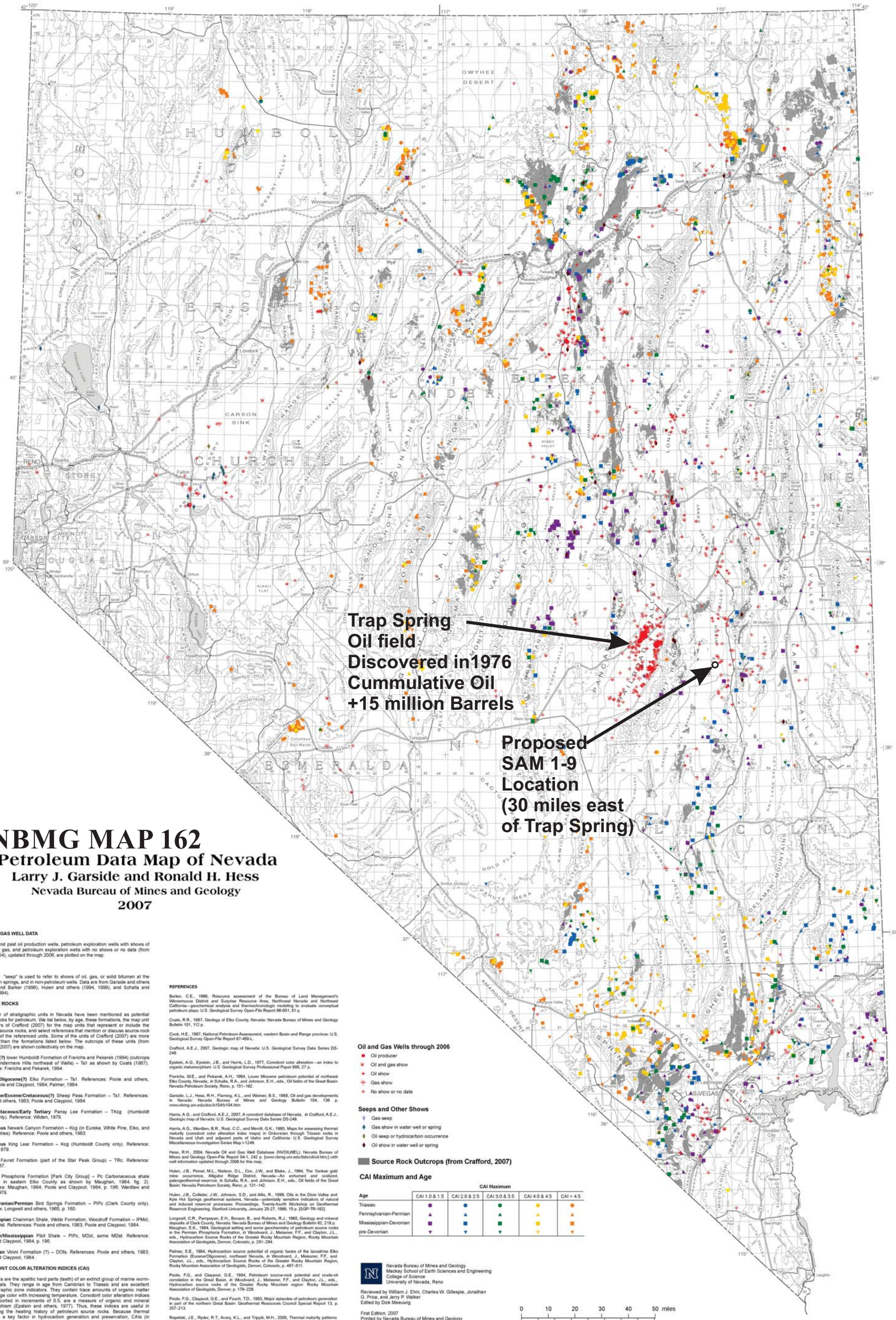
NEVADA BUREAU OF MINES AND GEOLOGY — MAP 162 PETROLEUM DATA MAP OF NEVADA



NBMG MAP 162

Petroleum Data Map of Nevada

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Nevada Bureau of Mines and Geology

2007

OIL AND GAS WELL DATA

Current and past oil production wells, petroleum exploration wells with shows of oil and/or gas, and petroleum exploration wells with no shows or no data (from Hess, 2004), updated through 2006, are plotted on the map.

SEEPS

The term "seep" is used to refer to shows of oil, gas, or solid bitumen at the surface, in springs, and in non-petroleum wells. Data are from Garside and others (1988), and Barker (1996), Hulen and others (1994, 1999), and Schalla and others (1994).

SOURCE ROCKS

A number of stratigraphic units in Nevada have been mentioned as potential source rocks for petroleum. We list below, by age, these formations, the map unit descriptors of Crafford (2007) for the map units that represent or include the potential source rocks, and select references that mention or discuss source-rock potential of the referenced units. Some of the units of Crafford (2007) are more inclusive than the formations listed below. The outcrops of these units (from Crafford, 2007) are shown collectively on the map.

Miocene(?) lower Humboldt Formation of Frerichs and Pekarek (1994) (outcrops in the Windermere Hills northeast of Wells) – Ts1 as shown by Coats (1987). Reference: Frerichs and Pekarek, 1994.

Eocene/Oligocene(?) Elko Formation – Ts1. References: Poole and others, 1983; Poole and Claypool, 1984; Palmer, 1984.

Paleocene/Eocene/Cretaceous(?) Sheep Pass Formation – Ts1. References: Poole and others, 1983; Poole and Claypool, 1984.

Late Cretaceous/Early Tertiary Pansy Lee Formation – TKcg (Humboldt County only). Reference: Wilden, 1979.

Cretaceous Newark Canyon Formation – Kcg (in Eureka, White Pine, Elko, and Nye Counties). Reference: Poole and others, 1983.

Cretaceous King Lear Formation – Kcg (Humboldt County only). Reference: Wilden, 1979.

Triassic Favret Formation (part of the Star Peak Group) – TRc. Reference: Cook, 1987.

Permian Phosphoria Formation [Park City Group] – Pc Carbonaceous shale members in eastern Elko County as shown by Maughan, 1984, fig. 2). References: Maughan, 1984; Poole and Claypool, 1984, p. 196; Wardlaw and others, 1979.

Pennsylvanian/Permian Bird Springs Formation – PIPc (Clark County only). Reference: Longwell and others, 1965, p. 160.

Mississippian Chainman Shale, Webb Formation, Woodruff Formation – IPMcl, MDcl, MDst. References: Poole and others, 1983; Poole and Claypool, 1984.

Devonian/Mississippian Pilot Shale – PIPc, MDcl, some MDst. Reference: Poole and Claypool, 1984, p. 196.

Ordovician Vinini Formation (?) – DOts. References: Poole and others, 1983; Poole and Claypool, 1984.

CONODONT COLOR ALTERATION INDICES (CAI)

Conodonts are the apatitic hard parts (teeth) of an extinct group of marine worm-like animals. They range in age from Cambrian to Triassic and are excellent biostratigraphic zone indicators. They contain trace amounts of organic matter that change color with increasing temperature. Conodont color alteration indices (CAI), reported in increments of 0.5, are a measure of organic and mineral metamorphism (Epstein and others, 1977). Thus, these indices are useful in interpreting the heating history of petroleum source rocks. Because thermal history is a key factor in hydrocarbon generation and preservation, CAIs (in combination with source-rock organic content) can be useful in evaluating petroleum potential. Harris and Crafford (2007) reported maximum and minimum CAI values for collections of Nevada conodonts. Most collections did not exhibit a range, and the maximum and minimum values were the same. However, some samples exhibited a range of 0.5 to 4 or more. We plotted the maximum values reported by Harris and Crafford (2007). We suggest that if any of the conodonts were heated to a higher level in the host rock, then any associated hydrocarbons would have also reached those temperatures (e.g., Repetski and others, 2005). In general, CAI > 4.5 is considered to be the thermal cutoff for most hydrocarbon production (Harris and others, 1980).

The ages of the conodonts (and thus the rocks sampled) were represented using the AgeMin numerical column in Harris and Crafford (2007): <3099 – Triassic; 3100–3299 – Pennsylvanian-Permian; 3300–3499 – Mississippian-Devonian; >3500 – pre-Devonian

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Oil and Gas Wells through 2006

- Oil producer
- Oil and gas show
- Oil show
- Gas show
- No show or no data

Seeps and Other Shows

- Gas seep
- Gas show in water well or spring
- Oil seep or hydrocarbon occurrence
- Oil show in water well or spring

Source Rock Outcrops (from Crafford, 2007)

CAI Maximum and Age

	CAI Maximum				
Age	CAI 1.0 & 1.5	CAI 2.0 & 2.5	CAI 3.0 & 3.5	CAI 4.0 & 4.5	CAI > 4.5
Triassic	●	●	●	●	●
Pennsylvanian-Permian	▲	▲	▲	▲	▲
Mississippian-Devonian	■	■	■	■	■
pre-Devonian	▼	▼	▼	▼	▼

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0 10 20 30 40 50 miles
0 20 40 60 80 kilometers

Scale 1:1,000,000
1 inch equals approximately 16 miles

Base Map: Modified from NBMG Map 43, 1995