

## ABSTRACTS

### DOCUMENTARY AND ARCHAEOLOGICAL EVIDENCE OF PREHISTORIC AND PROTOHISTORIC PETROLEUM IN PENNSYLVANIA

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While 27 August 1859 is normally considered to represent the birth of the petroleum industry both in North America and the world at large, extensive historic data suggest that oil exploitation minimally extends back into early historic and proto-historic times. Sporadic archaeological excavations throughout the twentieth century, and even earlier, further indicate the possibility that the aboriginal use of petroleum may date well into the Woodland period. The extant historic and prehistoric databases for aboriginal oil exploitation in Pennsylvania and neighboring areas are reviewed and assessed. Accelerator mass spectrometry analysis of a timber from an alleged aboriginal oil collection pit at 36VE174, conducted as part of this study, yielded a combined calibrated radiocarbon age of A.D. 1415-1440.

### EARTHEN OIL STORAGE IN 20<sup>TH</sup>-CENTURY U. S. FIELDS

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Crude oil storage in earthen tanks or pits became common with the discovery of heavy oil fields in California (1900) and Texas (1901). Earthen storage was used for two different purposes—as short-term lease storage during a flush production episode where other storage or transportation facilities were not yet available and as cheap longer-term storage at tank farms. The most common construction style was a rectangular pit 7 to 8 feet deep with surrounding earthen levees 6 feet high; California storage also included circular to oval-shaped styles. Better-built earthen storage was lined with clay or asphalt and covered with wooden roofs, but uncovered pits with no ground preparation were also common. Prior to market demand for lighter ends, evaporation loss in open storage was not considered a negative factor. Problems with extensive leakage and evaporation of light oil made earthen storage unpopular in high-gravity districts after the extensive and highly-publicized waste at Cushing Field, OK (1914-1916). Three regions used earthen storage tank farms for long-term heavy oil storage through the 1930s—southeast Texas (Spindletop, Humble, Sour Lake fields), central California (Kern River Field), and southern Arkansas (Smackover Field). Evaporation and seepage were less, and the loss was acceptable due to the lower value of heavy crude and the cheap cost of building earthen storage. Evaporation losses varied from 3 % to 6 % while seepage losses ranged from 4 % to 10 % per year for heavier crude.