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HYDROCARBON SEEPS IN MIDDLE MIOCENE TOPANGA FORMATION NORTH OF THE BEVERLY HILLS OIL FIELD, LOS ANGELES, CALIFORNIA

We investigated the migration pathway patterns of hydrocarbon residues observed in several cut slopes of an unnamed east-west-trending anticlinal fold, during grading operations of approximately 25 acres. The site is located within a valley and ridge located in the Santa Monica Mountains at Sec. 3, T1S, between Beverly Hills and Sherman Oaks.

The hydrocarbon residues were identified and mapped within inter-bedded sandstone and shale layers of the anticline. Results from the geologic mapping of the anticlinal structure on the northern portion of the site identified residues of the multiple hydrocarbon seeps in a medium-grained sandstone associated with sulfide deposits that occur within the middle Miocene strata of the Topanga Formation. Field and laboratory samples were collected for visual examination only and results were assessed as to having an 85% probability that samples collected were from inactive hydrocarbon seeps.

The primary tectonic controls for the location and distribution of hydrocarbons in sediments are in east-west trending faults and an east-west trending anticlinal fold related to pre-Modelo folding of middle Miocene age. Within the relatively small fault zone, several inactive hydrocarbon seeps are present and have migrated along fractures and bedding planes. The area is dominated by compressional faults in the Los Angeles region, where heavy oil-tar seeps were the result of a loss of volatiles and the biodegradation of the oil to tar migrating up-dip along the south-dipping outcrop of the middle Miocene Topanga Formation.