

COMMENT RE HUMMON ET AL. ( 1 994)

Harold R. Lang

Jet Propulsion Laboratory, California Institute of Technology, Pasadena,  
California 91109-8099

Most of the structures that Hummon et al. (1 994) report as new discoveries have actually been reported preciously in the 'literature. Some of their assertions are invalid based on available published subsurface mapping, and because of inconsistencies on their maps.

Based on **SURFICIAL** mapping alone, it may be true that the Whittier Narrows earthquake resulted in discovery of a "previously unrecognized zone of blind reverse faults and folds" in the **L.A.** basin. It is NOT true that the reverse Whittier fault system is blind based on long available published **SUBSURFACE** mapping. Twenty years ago, detailed maps and cross sections for the **Brea-Olinda, Sansinena, Whittier and Montebello** oil fields,' including the regional cross section A-B, published in California Division of Oil and Gas (**CDOG**) (1974) documented reverse faulting, thrust faulting and folding on the Whittier fault system. These structures were probably missed by **surficial** mapping because the basin's surface veneer is an extremely poor medium for recording structure. It is made of structurally incompetent, expansive clay-bearing Pliocene mudrocks and

Quaternary sediments that have been disrupted by Holocene slumping, sliding and erosion, and by two centuries of urban development.

Fig. 1 shows a published alternative to Hummon's et al. map of NW L.A. basin structure. The Wilshire fault (**WF**) of Hummon et al. is the same fault that Lang and Dreessen (1974) mapped as the 6th Street fault. The strike of the two faults is identical. The trace of the WF, modelled by Hummon et al. at -2800 m, falls on the downdip projection of the 6th Street fault plane as mapped by Lang and Dreessen, and by CDOG (1974) at -530 m in the Salt Lake oil field. Eastward connection of this fault with the Whittier fault system also was proposed twenty years ago by Lang and Dreessen.

Hummon's et al. assertion that the WF is "limited to the west by the Newport-Inglewood fault" (their WBHL NIF) is inconsistent with their own maps. Westward extension of their mapped trace of the WF does not intersect their mapped trace of the WBHL NIF (Fig. 1). Furthermore, subsurface data do not support their assertion that the WBHL NIF is the Newport-Inglewood fault. Their WBHL NIF would have to cut both the CH and BH oil fields (Fig. 1). Subsurface mapping of these fields (CDOG, 1974), constrained by dense subsurface control from some 200 boreholes, precludes the existence of any fault with the trace that they show.

Their assertion that the Hollywood fault (**HF**) is the NE continuation of

the Santa Monica fault (SMF) is incorrect. Their surficial mapping of the SMF is probably correct, because it corresponds with the surface projection of the fault plane as mapped in the subsurface (compare Fig. 1 to **Hummon's** et al. fig. 2). They map the HF on the NW side of the subsurface trace of the SMF. This implies that the I-IF is a different fault than the SMF. Hummon et al. missed the SMF in interpretation of their fig. 3 cross section. According to Lang and **Dreessen's** mapping, the SMF cuts their "cross section" in the area below the Hollywood basin where they show question marks and obvious structural disruption and thickening of L. Puente strata.

Fault mapping in the L.A. basin is critical for seismic hazard assessment. It must be done using all available data.

#### REFERENCES CITED

- California Division of Oil and Gas, 1974, California Oil and Gas Fields, Volume II, South, Central Coastal and Offshore California: Sacramento, California Division of Oil and Gas, Report No. TR12.
- Lang, H. R., and **Dreessen**, R. S., Jr., 1974, Subsurface structure of the northwestern Los Angeles basin: Sacramento, California Division of Oil and Gas Technical Papers, Report No. TPO1, p. 15-21.
- Hummon**, C., Schneider, C. L., Yeats, R. S., Dolan, J.F., Sieh, K. E., and **Huffile**,

G.J., 1994, Wilshire fault: earthquake in Hollywood?: *Geology*, v. 22, p. 291-294.

Figure 1. Subsurface structure of the NW L.A. basin, on top of the Topanga Formation (after Lang and Dreessen, 1994, fig, 3). Trace of the Santa Monica fault follows their -2700 m (below sea level) fault plane contour. Structures north of the Santa Monica fault are from surface mapping. Dashed traces of the WBHL NIF (at ground surface) and Wilshire fault (at -2800 m below surface) are from Hummon et al. figs. 2 and 4, respectively. Trace of. ~~the~~ 3RD Street fault is from the CDOG (1 974) Salt Lake oil field map. Oil field productive limits shown by stipple pattern: SH (Sherman), SL (Salt Lake), SV (San Vicente), SSL (South Salt Lake), BH (Beverly Hills), SA (**Sawtelle**), and **CH** (Cheviot Hills).

