Legislation Text

File #: 05-2443, **Version:** 1

Recommendation to receive and file the report, "Elevation Changes in the City of Long Beach, May 2004 to November 2004." (Citywide)

The City of Long Beach, through the Department of Oil Properties (DOP), supervises Wilmington Oil Field oil production and water injection, and monitors subsidence control operations. Elevation surveys have been conducted at least semi-annually since 1965. Eleven permanent stations of the Long Beach Global Positioning System (GPS) Deformation Network were completed in Spring 2003. Two new stations were added since the May 2004 Elevation Survey. Now, thirteen permanent GPS stations are being fully utilized in combination with mobile GPS survey equipment to conduct the DOP semi-annual elevation surveys. This report discusses bench mark elevations surveyed in November 2004 and compares elevation changes that have occurred since completion of the May 2004 and November 2003 surveys. These data are also compared with earlier semi-annual data for analysis of trends. The surveyed area includes the Harbor District, Civic Center, Central City, Alamitos Bay, and Naples. City elevations were stable or increased slightly in elevation for both the six-month and one-year periods. Both survey periods are interpreted to be "up" and most likely related to movement of the entire Long Beach area due to "earth forces" and not the oil-operations. A six-month localized elevation increase of 0.050 feet (0.600 inches) along Ocean Boulevard between Cherry and Alamitos is being carefully monitored. Within the Harbor District, elevations also remained stable or increased slightly during both survey periods. A slight elevation increase of up to 0.062 feet (0.744 inches) occurred at Pier G during the six-month period. The curtailed Tar II steam flood area around Henry Ford Avenue lost up to -0.056 feet (-0.672 inches) of elevation. Alamitos Bay, Naples, and the oil islands Chaffee and Freeman remained stable for the six-month period. Elevation increases at islands Grissom and White were associated with the Ocean Boulevard increase. Due to stable oil field elevations during the six-month and one-year periods, water injection rates will remain the same. The area of greatest elevation loss in the oil field is centered over the Tar II reservoir that had been injected with steam (as discussed on page one of the report). High steam temperatures were found to cause compaction of the deep clay layers. An active program of cold water injection and production is slowly cooling the reservoir to mitigate elevation loss. Studies by the City's subsidence control engineers, geologists, and consultants show that the bench marks may appear to rise and fall in such a manner as to make an entire survey either optimistic (up) or pessimistic (down). These changes in bench mark elevations can be seasonal or random and may be associated with tidal cycles, temperature changes, and/or deep earth tectonic changes. Repressuring operations and the resulting rebound alter or mask these patterns from time to time. Surface elevations in a rebounded area can be expected to fluctuate under changing water flood conditions.

This item was reviewed by Deputy City Attorney Charles Parkin on February 15, 2005 and Budget Management Officer David Wodynski on February 16,2005.

City Council action on this matter is not time critical.

There is no fiscal impact associated with this action.

Approve recommendation.

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CHRISTOPHER J. GARNER
DIRECTOR OF OIL PROPERTIES