

## **Water Injection Surveillance in Large off Shore Carbonate Reservoir of Mumbai High – A Case Study**

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Mumbai High South field was put on production in October 1980 and has undergone several rounds of development in order to improve oil recovery from the field. Although development of Mumbai High South field started in 1980, the western peripheral area has been a subsequent development. This area comprising of 7 platforms is producing mainly from 'A1' sub-layer of L-III reservoir. It lies west of the injection platforms WIX1, WIX2, WIX3 and WIX4, initially thought to be on the western producible limit of Mumbai High South field.

Platforms A1 and A2 (1990) indicated extension of the western boundary due to flattening of structure and established the oil production potential of the peripheral area. Platforms A3, A4 and A5 (1993-94) indicated development of 'A1' sub-layer but the initial conventional wells had limited productivity/injectivity. The area was further developed with horizontal/ multilateral wells from A6 and A7 platforms (2002-05). These horizontal wells came initially with very good production rates, which declined sharply, especially of the wells towards west, away from the injection platforms. The high decline could be attributed to negligible pressure support from western natural aquifer influx and tight reservoir characteristics leading to poor pressure transmissibility from the eastern injection platforms.

A pilot water injection project aimed at enhancing water injection through additional line of injectors was initiated in Nov.'07 by converting two existing producers into water injector from platform A6 in an E-W line pattern. The regular monitoring of the project in terms of oil rate, water-cut, salinity and ionic concentration have been effectively used as water injection performance monitoring tools.

The paper presents the application of these inexpensive techniques in this successful project in the peripheral sector of Mumbai High South (L-III) field.