



## Atlantis—Finding a Field within a Field

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### ABSTRACT

The Atlantis Field is the Gulf of Mexico's third-largest deepwater field located in the Green Canyon protraction area. Atlantis is a faulted four-way salt cored anticline with oil-filled basin floor turbidite reservoirs across the middle to lower Miocene interval. Characterization of a large part of the subsurface at Atlantis has been difficult due to the complexity of salt bodies which overlie the productive reservoirs in the north-eastern half of the field. Because of this complexity there is a large area in that part of the field that has remained untested.

Over the years the Atlantis Field has been a testing ground of new seismic technologies which have improved the imaging step by step and proven its value by better structure and fault definition resulting in improved infill target description and reduced drilling uncertainty. Examples of these advanced seismic imaging techniques include anisotropic imaging, Ocean Bottom Nodes (OBN) acquisition and time lapse (4D) monitoring of reservoir changes due to production and injection.

In 2014–2015, a large scale OBN survey was collected over the field including full azimuth, ultra-long offsets that resulted in improved 3D and 4D imaging. Beyond the expected impact this dataset also allowed for full wavefield inversion (FWI) to be successfully applied at the Atlantis Field. FWI is an automated, computer intensive algorithm that creates the velocity model to be used for seismic imaging. Applying this algorithm on the 2014–2015 dataset resulted in a significantly improved image of the subsalt area which led to higher confidence interpretations and discovery of the “Field within a Field.” As a result, BP has been able to announce the Atlantis Phase 3 development that includes wells targeting this part of the field.

Looking at the future there are several more development opportunities on the horizon including additional producer targets and advanced oil re-

covery using an expanded water injection program. Future developments will be supported by further seismic advancements such as additional 4D seismic monitoring, the acquisition of a low frequency source survey and implementation of distributed acoustic sensing in the Atlantis Phase 3 wells.