



## A Monster from the Deep

Posted by [Euan Mearns](#) on December 21, 2011 - 3:29pm

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With relatively little fanfare on the international stage, [Lundin Petroleum](#) and [Statoil](#) (and partners) have just recently jointly discovered one of the largest oil fields ever found in the North Sea. The Aldous Major South - Avaldsnes discovery on the Utsira High structure is currently estimated to contain 1.7 to 3.3 billion barrels of recoverable oil. The astonishing thing about this discovery is that it has lain undiscovered in a mature oil province for so long providing ample encouragement for explorers to go on exploring.

The recoverable resource estimates have grown with every well drilled and with [a new delineation well spudded on 28th November](#), further news on the size of this giant is expected in early January.

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***Figure 1** Oil fields can often be imagined as subterranean hills draped in mudstone (the seal) and partially filled with oil-saturated sandstone. [This 3D image](#) shows the Avaldsnes and Aldous Major South discoveries are in all likelihood part of the same giant field.*

*This post is joint with Rune Likvern. One of us (EM) owns common stock in Lundin Petroleum.*

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The Aldous Major South - Avaldsnes story has been a year in the making. The 16/2-6 discovery well was announced in September 2010, but the story only gained traction on 30th September 2011 when the recoverable resource estimate was substantially increased following [evaluation of data from the 16/2-7a sidetrack well](#). Prior to then recoverable resource estimates for Avaldsnes were in the range 100-400 million barrels - not enough to get overly excited about. The 16/2-7a well extended the area of proved hydrocarbons but also "proved" that Avaldsnes and Aldous Major South were part of the same gigantic structure. Avaldsnes is now estimated to hold 0.8 to 1.8 billion barrels of recoverable oil and promises to be a giant field in its own right.

**A note on terminology.** The term resource is normally used to describe the quantity of oil in place and the term reserves used to describe the amount of that oil that can be economically recovered. At this stage of field appraisal, none of the oil in Aldous Major South - Avaldsnes can yet be booked as technical reserves. Instead the term recoverable resource is employed.

**A note on well numbering convention.** Well number 16/2-6 means that the well was drilled in Norwegian quadrant 16. Each Norwegian quadrant is divided into 12

blocks, and this well was drilled in block 2. It is the 6th well to be drilled on this block.

Shortly after, Statoil announced the results from the [16/2-10 delineation well on Aldous Major South](#) on 21st October, which prior to then was estimated to contain 0.4 to 0.8 billion barrels recoverable resource. The 16/2-10 well proved a much bigger resource that is now estimated in the range 0.9 to 1.5 billion recoverable barrels.

Thus the combined Aldous Major South - Avaldsnes structure is now estimated to contain between 1.7 and 3.3 billion barrels of recoverable oil. The 16/5-2S well currently drilling represents a significant step out from the existing wells towards the south of the field. Success is not to be taken for granted. For example, the mapped structure is dependent upon accurate interpretation of seismic and the occurrence of oil is dependent on the presence of the reservoir sandstone in this part of the field. Should the well fail to find oil, then the resource estimate may settle toward the lower end of the current range; however, should it be successful then ever larger numbers are to be expected.

This [recent presentation](#) (large pdf) from Lundin states that the oil is intermediate grade with API gravity of 28° (slide 31) and that oil is "dripping out of the cores" (see picture on slide 31). Furthermore the water depth at 115 m is shallow by today's standards as is the depth to reservoir, which is only 1900m. All this seems too good to be true and as a rule of thumb, when something is too good to be true it often, though not always, is.

This discovery is remarkable since it will not only transform the fortunes of Lundin Petroleum and provide a welcome boost to Statoil, but it may also materially affect the future production profile for Norway. Norwegian oil production peaked in 2001 at 3.42 mmbpd (crude+condensate+NGL) and has been declining at an average rate of 5% for the last 9 years. The impact of Aldous Major South - Avaldsnes coming on stream towards the end of the decade is shown below. The field may build to a plateau production rate of around 500,000 bpd and remain on plateau for 11 years. The stacked production chart extends to 2040 and shows 3.3 billion barrels production from this sleeping giant. Production decline may be reversed for two to three years while the field is building to plateau. In 2040, this one field may account for over half all Norwegian oil production.

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**Figure 2** Stacked production chart for all Norwegian crude oil fields showing the peak in 2001. The stacked colored areas to the left represent the production from past and existing oil fields. Data from the [Norwegian Petroleum Directorate](#). The green segment shows a production model for Aldous Major South - Avaldsnes with first production in 2017 and plateau production of 500,000 bpd reached in 2020. Decline sets in by 2031. The production model as shown contains 3.3 billion barrels of oil produced from Aldous Major South - Avaldsnes.

Whilst the discovery of Aldous Major South - Avaldsnes is a welcome boost for future North Sea production, with the world consuming 88 million bpd, 3.3 billion barrels of recoverable oil represents only 38 days of global oil consumption.



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