

### Modeling of system flow behaviour (reservoir to sea)

There are four data points in which we have good confidence... reservoir pressure of ~12000 psi, seabed water pressure of ~2250 psi, fluid properties (bubble point ~6600 psi, gas-oil ratio ~2800 scf/bbl, and fluid composition), and flow path to sea being out of the full bore of the riser.

We are currently less certain of the following aspects, and need to keep abreast of the up-to-date view on each in order to maintain the best available model of the system:

- in-flow performance both prior to incident and after any formation damage that could have occurred during the incident
- flow path from sand face to mud line, whether this is through the drill pipe or up the casing string
- flow path through the ROP stack and into the riser, particularly on the effect of the

The further variable of reservoir in-flow performance is also modelled with three illustrative values, 1 bbl/d/psi, 10 bbl/d/psi and fixed bottomhole pressure. The last of these three shows the maximum hydraulic capacity of the system from bottomhole to sea and is a theoretical-only worst case. In reality the reservoir will always impose some resistance to flow, given by the illustrative values of 1 and 10 bbl/d/psi. We need the view of Macondo subsurface modeller and well designer to give us their view of the most appropriate value.

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The data generated takes the form of the following illustrative table:

Orifice size inches diam	Flowrate stock tank bbl/day	Wellhead flowing pressure, psi	Flow path
0.25	2523	8567	All Drill string
0.5	9840	8514	
0.75	20838	8170	
1	33184	7472	
2	58284	4984	
3	85171	4119	

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