

## Drilling Mud Composition for BP's Exploration Well

The chemicals below are the constituents of the synthetic non-aqueous drilling fluid system currently being used on BP's Aspy D-11 well, on-board the West Aquarius drilling rig. These chemicals are routinely used in global well construction activities, and are not necessarily limited to oilfield usage.

Chemical Name	Cas.	Chemical Purpose	Product Function
Calcium Hydroxide	1305-78-8	Provides a source of alkalinity to neutral any the effects of any acid gas intrusions.	pH Adjustment Agent
* Calcium Chloride	10043-52-4	An inorganic salt added to the water-phase of a non-aqueous drilling fluid system, also serve to inhibit undesirable formation reactions such as clay swelling.	Brine-Phase Water Activity Adjustment Agent
Calcium Carbonate	1317-65-3	Used as a sealing agent to prevent the loss of the drilling fluid system into porous formations.	Bridging Agent
Barite	13462-86-7	High density natural mineral to control the density of the drilling fluid system.	Weighting Agent
Organophillic Clay		A natural clay mineral that has been chemically modified to provide viscosity in non-aqueous drilling fluid systems.	Gelling Agent
Styrene Acrylate Polymer		Copolymer that provides filtration control, reducing invasion of the fluid system into permeable formations.	Fluid Loss Reducer
Tall Oil / Fatty Acid reaction product		Provides preferential wetting to ensure solids incorporated into the fluid system are not water-wet	Wetting Agent
TOFA maleic anhydride, and Polyamine	689-90-47-6	Provide emulsification of the water and non-aqueous phase of the drilling fluid system	Emulsifier
Dipropylene glycol methyl ether		Provides elevated low shear rate viscosity	Viscosifier
**Synthetic isoalkane, hydrocracked, hydroisomerized, hydrogenated, C10-25, branched and cyclic	445411-73-4	Synthetic base fluid that provide the continuous phase of the non-aqueous drilling fluid system.	Base Fluid

- \*\* Note: The non-aqueous base fluid is the largest volumetric component of the fluid system comprising 50-65% of the total fluid system.

- \* The Calcium Chloride aqueous brine phase is the second largest component representing 10-20% of the total fluid system.