

Drilling mud treatment for each phase

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Resume

Our work consist in study and explore drilling fluid and its treatment for each phase which has different features, also to determinate and explain the roles of each product has been added or mixed. The drilling fluid nature is directly related to the geological formation and environmtal policy of the company.

Most of drilling problems are due to bad treatment of mud, a good treated mud leads to successful drilling operation.

Work Plan

- I.Introduction to drilling fluid.
- II.Drilling fluid functions.
- III.Drilling fluid treatment and selection

Introduction

Drilling is method or way to get the hydrocarbons formation. It's make the connection between the surface and the bottom of the well passing throw many phases [1].

This phases has different features, different pressures, different fluids, this fluids should be kept in the formation and avoid any flow into the well by keeping the bottom pressure higher than formation pressure, this pressure is applied by drilling fluid So the main question is how should we choose the drilling fluid and how to treat it for each phase to avoid the problems such as well control problems, stuck pipe...etc,and to gain time ,money and work in safe conditions?

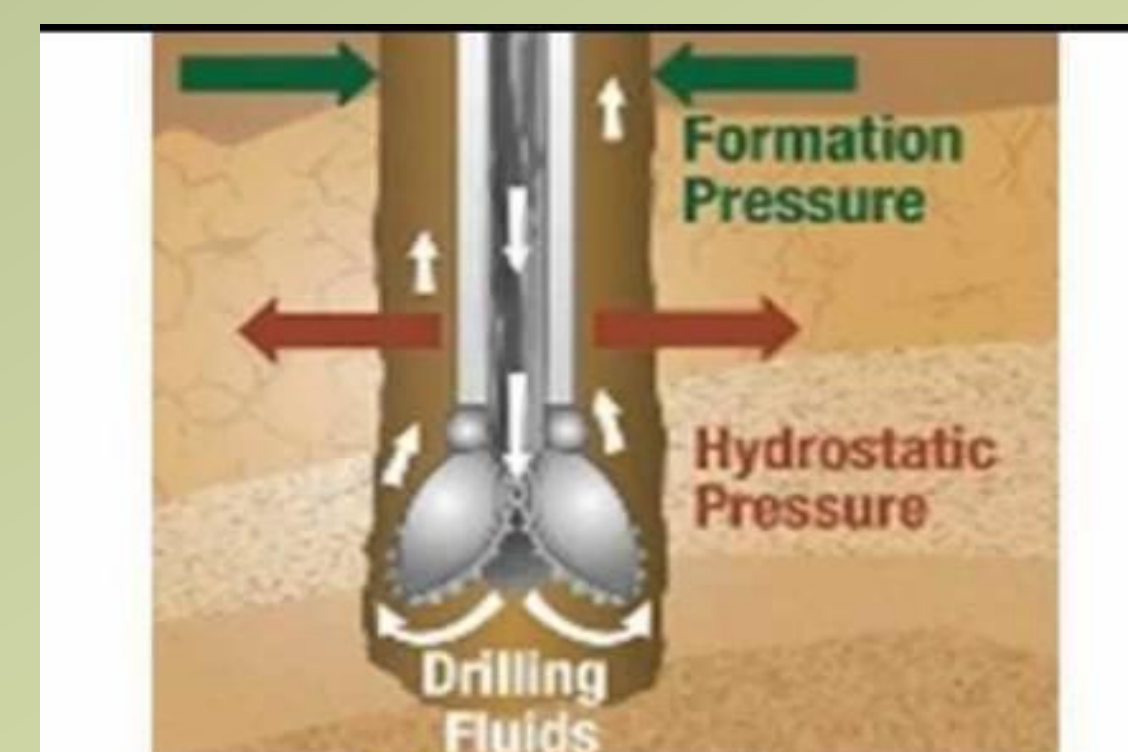


Pic (1):drilling mud

I. Drilling Mud function

Drilling fluids perform numerous functions that help make this possible. The responsibility for performing these functions is held jointly by the mud engineer and those who direct the drilling operation

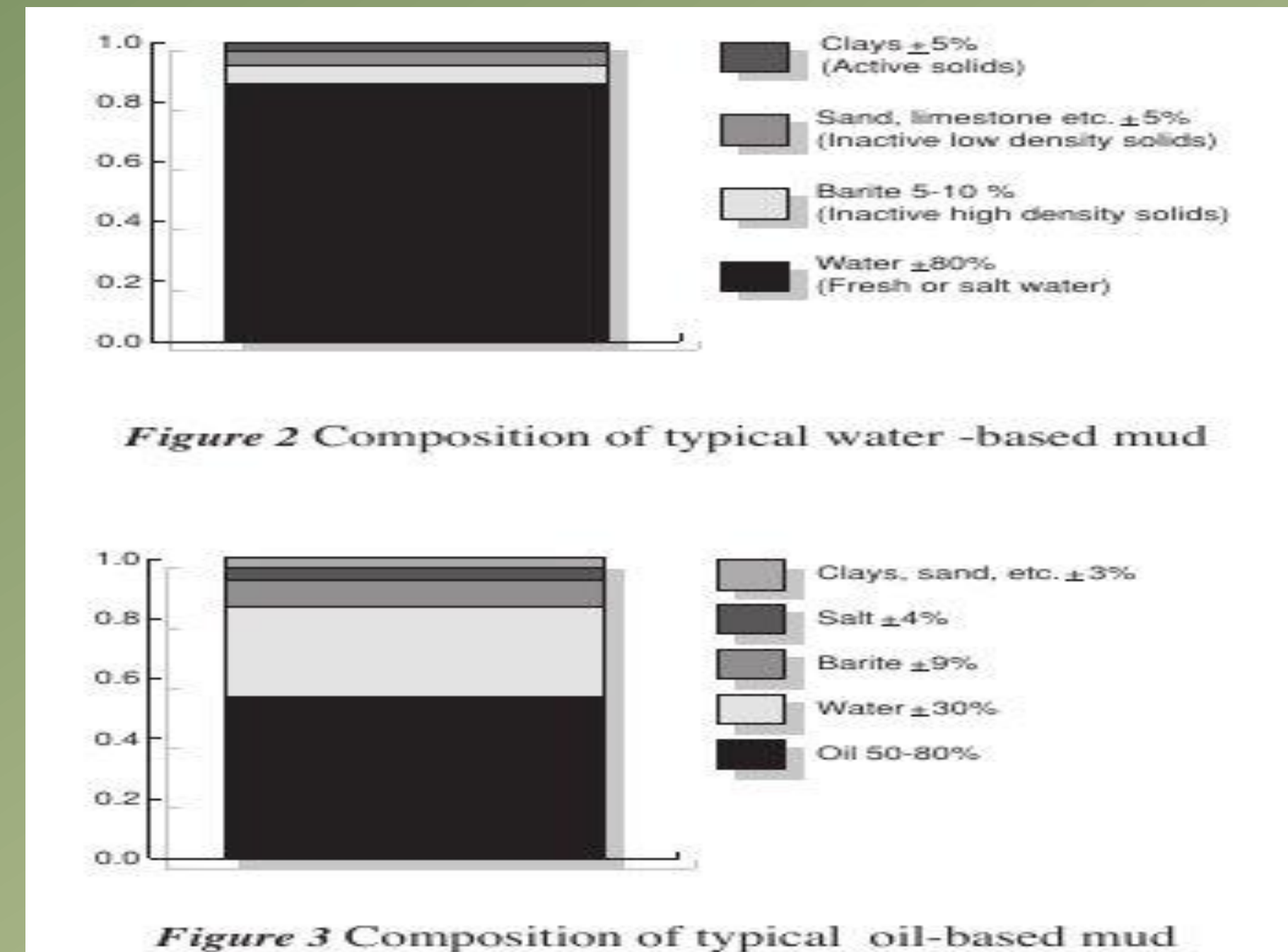
1. Remove cuttings from the well
2. Controlling formation pressures
3. Suspend and release cuttings
4. Seal permeable formation
5. Maintain wellbore stability
6. Minimize formation damage
7. Cool, Lubricate, Support the bit anddrilling assembly
8. Transmit hydraulic energy to tools and bit



Pic (2):dynamic pressure

II. Drilling fluids Types

1. Oil based mud (OBM)
2. Water based mus (WBM)
3. Gas/Liquid Mixture
4. Gas



Pic (3): Drilling mud components

III. Drilling fluid traitement and selection

A well is a deep hole, goes by many different formations which has different features, the mud features depend on the formation ones The mudlogger should follow the cutting to know if there is any changes in the formation, so we must treat the mud according to the new changes.

1. Phase 8”3/8:

Before any pool out of hole, pump a high vis to clean the welland circulate at least 1.3 bttom up

a. products to be added and their amount:

Products	role
Organophilic clay	viscosifier
Primery emulsion	Keep the emulsion in the solution
Secondary emulsion	Keep the emulsion in the solution
Lime	The alcalinity
Baryte	Decrease SG

b. preparation:

The mud of previous phase (12”1/4) should be recirculated and treated to be used in this phase. Its report oil/water is kept to 85/15, and the SG should be decreased to 1.50 by mud cleaner (removing baryte particles and also using a new mud with lower SG

The report oil/water and others characteristic should be adjusted as shown in the program .

Make a change in the mud's SG while drilling ciment tools (plugs...)

A high vis plug of SG=1.50 will be pumped between the old and new mud

IV.Hassi messaoud lithology

ERE	SYST	ETAGES	Ep moy	DESCRIPTION			
MESOZOIQUE	NEOGENE	MIO-PLIOCENE discordance alpine	240	Sable, calcaire, marne sableuse			
		EOCENE	120	Sable, calcaire à silex			
		SENONIEN	CARBONATE	107	Calcaire, dolomie, anhydrite		
			ANHYDRITIQUE	219	Anhydrite, mame, dolomie		
			SALIFERE	140	Sel massif et traces d'anhydrite		
		TURONNIEN	90	Calcaire crayeux avec quelques niveaux argileux			
		CENOMANIEN	145	Anhydrite, marne, dolomie			
		ALBIEN	350	Grès, sable avec intercalations d'argile silteuse			
		APTIEN	25	Dolomie cristalline avec niveau argileux, calcaire			
		BARREMIEN	280	Argile, grès, dolomie			
		NEOCOMIEN	180	Argile, marne, dolomie, grès			
		MESOZOIQUE	JURASSIQUE	MALM	225	Argile, marne, calcaire, grès et traces d'anhydrite	
				LIAS DOGGER	ARGILEUX	105	Argile silteuse, marne dolomitique avec fines passées de grès.
					LAGUNAIRE	210	Anhydrite, marne dolomitique, marne grise
					L.D 1	65	Dolomie, anhydrite, argile
				L.S 1	90	Alternances sel, anhydrite et argile	
				L.D 2	55	Anhydrite et dolomie cristalline	
				L.S 2	60	Alternances sel et argile	
				L.D 3	30	Alternances de dolomie et de marne	
				MESOZOIQUE	TRIASSIQUE	SALIFERE	TS 1
TS 2	189						Sel massif à intercalations d'anhydrite et argile gypsifere
TS 3	202	Sel massif et traces d'argile					
ARGILEUX	113	Argile rouge dolomitique ou silteuse injectée de sel et d'anhydrite					
GRESEUX	35	Grès, argile					
PALEOZOIQUE	ORDOVICIEN	ERUPTIF discordance hercynienne	0-92	Andésites altérées			
		QUARTZITES D'EL HAMRA	75	Quartzites fines avec traces de figillites			
		GRES D'EL ATCHANE	25	Grès fins à ciment argileux, bitumineux			
		ARGILES D'EL GASSI	50	Argiles schisteuses, vertes ou noires, glauconieuses à graptolites			
		ZONE DES ALTERNANCES	20	Alternance de grès et argile. Présence de figillites			
		CAMBRIEN	R1	50	Grès isométriques, fins, silteux		
			Ra	120	Grès à grès quartzitiques anisométriques à niveaux de silts		
			R2	100	Grès moyens à grossiers à ciment argileux illitique		
			R3	300	Grès grossier à ciment argileux, argile silteuse		
		INFRA-CAMBRIEN	45	Grès argileux rouges			
SOCLE				Granite porphyroide rose			

Pic (4): lithology of hassi messaoud

V. Environmental and safety regulation

Awareness of the environment among the public, regulatory agencies, customers and service companies has made environmental concerns a key factor in drilling operations. Environmental issues are broad-based and complex, influencing all aspects of drilling fluid system design and use. Health, Safety and Environmental (HS&E) regulations overlap to some degree, but they consider the issues from different perspectives Health and safety issues deal primarily with worker protection, while environmental issues deal with any impact to the environment

VI. Référence

- 1- initiation a l'industri petroliere etinitiation au forage M.DADDOU NOV-2007
- 2-IADC Drilling manual E-book version 2015
- 3-Baroid fluids book 1998
- 4-thesis theme drilling rig analysis Mr HAFSI Takieddine and Mr Owaa Ismail
- 5-Dewell

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