

# GLYCO-DRILL MC

A Case Study





## Overview

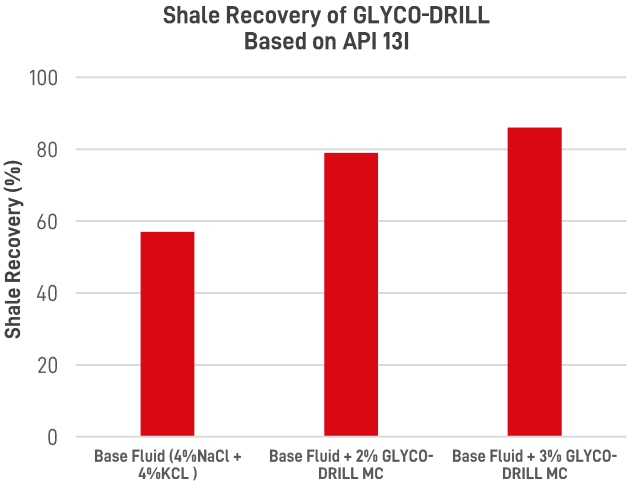
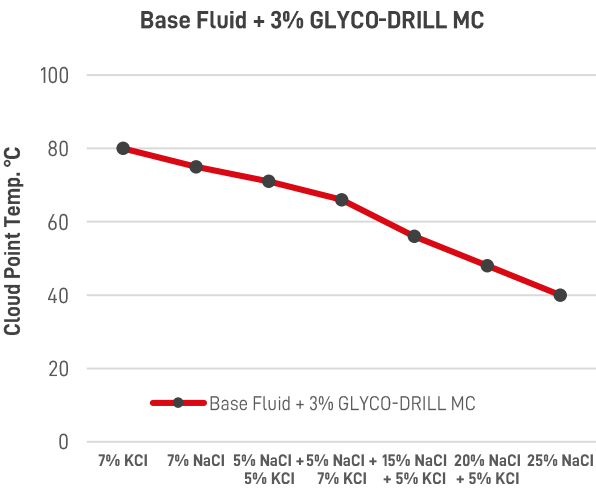
**GLYCO-DRILL MC** is a high performance drilling grade glycol derivative with a medium ranged cloud point temperature. It is compatible with a wide range of salinities up to various saturation levels and works with both sodium and potassium chloride salts.

| Properties                                          |                         | Unit | Standard         | Reference      |
|-----------------------------------------------------|-------------------------|------|------------------|----------------|
| Appearance                                          |                         | --   | Clear liquid     | -              |
| Specific Gravity                                    |                         | --   | 1.05-1.2         | --             |
| Solubility in water                                 |                         | --   | soluble in water | --             |
| pH                                                  |                         | --   | 6.0-8.0          | ASTM E70       |
| Water Percent                                       |                         | %w/w | Max. 1%          | ASTM E203      |
| Foaming Volume                                      |                         | %v/v | Max. 5.0%        | ASTM D3601     |
| Shale Recovery Enhancement (3% in 4% KCl + 4% NaCl) |                         | %    | Min 20%          | API 13I        |
| Cloud Point                                         | 3% in DI Water          | °C   | > 90             | ASTM D2024/PDF |
|                                                     | 3% in 7% KCl or 7% NaCl |      | 70-90            |                |
|                                                     | 3% in (5% KCl+5% NaCl)  |      | 70-90            |                |
|                                                     | 3% in(5%KCl+15%NaCl)    |      | 50-70            |                |
|                                                     | 3% in (5%KCl+20%NaCl)   |      | < 50             |                |
|                                                     | 3% in 25% Salt Water    |      | < 50             |                |



## Application

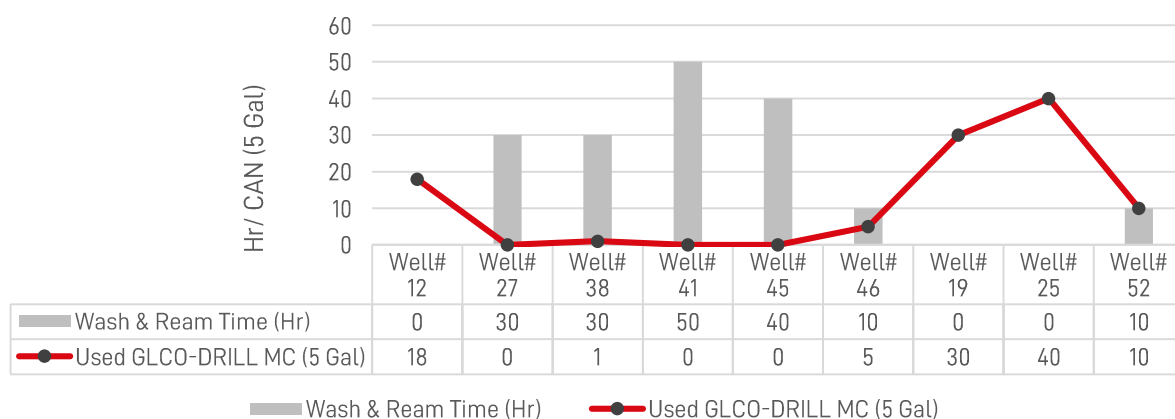
**GLYCO-DRILL MC** is applicable in all types of polymeric water based mud with different salinity to drill reactive clays and shales. The cloud point is approximately 40°C in saturated salt water and 70°C in drill water. When added to brine/polymer muds, it provides excellent shale control performance, therefore increasing cuttings hardness and producing marked decreases in whole mud dilution rates. It also provides more lubricity and reduces friction factor during sliding and directional drilling.



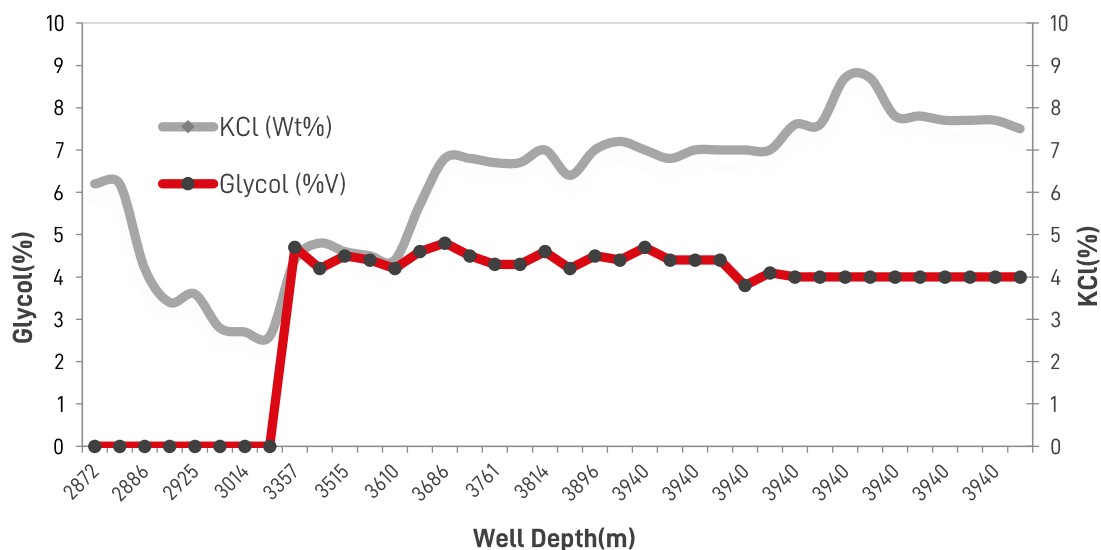


## PDF Solution & Experience

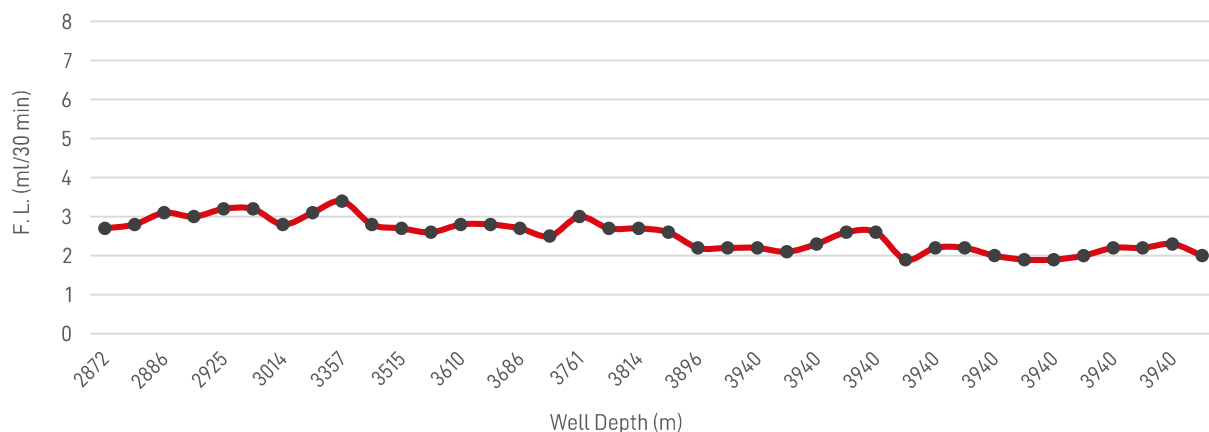
The PDF team used **GLYCO-DRILL MC** to overcome against wellbore instability particularly in lower sections of wells that include interbedded Clay/Shale layers. The figures below illustrate the performance of this additive in improving bore hole condition in 8.5" and 6" Hole sections.



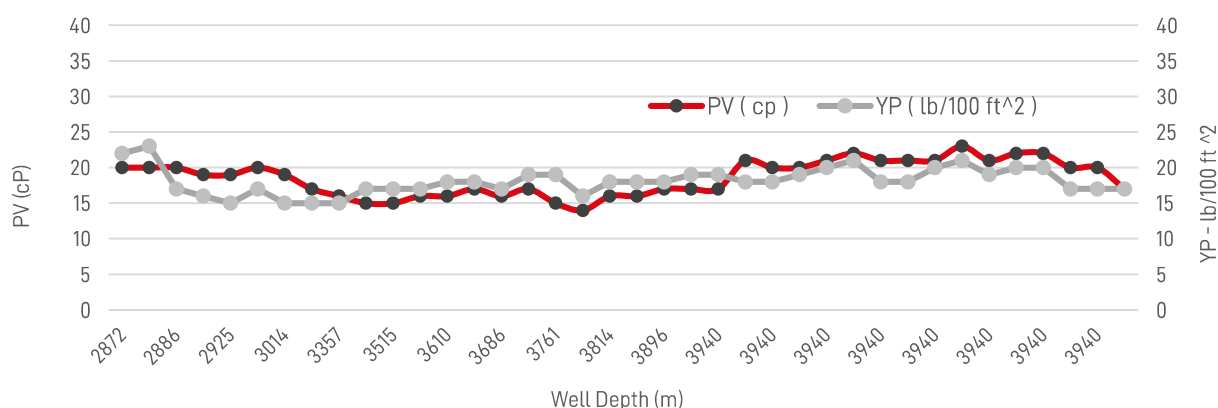
Using this additive has no side effect on mud rheology and fluid loss:



**The Alteration Amount of Shale Inhibitor Additives (KCl & Glycol)  
Related to Well Depth (in South Oil Field)**



**The Changes of API Fluid Loss Related to Well Depth in South Oil Field**



**The Changes of PV & YP Related to Well Depth in South Oil Field**

## \$ Economic Value

**GLYCO-DRILL MC** effectively decreases the possibility of stuck pipe, wash and ream time and consequently results in 10% time saving in drilling projects. Hole condition tripping hours also had a 10-20% decrement in comparison with previous drilled sections.

| Challenges           | Solutions                                                                            | Results                              |
|----------------------|--------------------------------------------------------------------------------------|--------------------------------------|
| Caving Shale         | Add GLYCO-DRILL MC to active fluid system Periodically or using in fluid formulation | * Improvement in shale stability     |
| Borehole Instability |                                                                                      | * Decrease possibility of stuck pipe |
| Stuck pipe           |                                                                                      | * Improve Hole Condition             |
| Wash and Ream        |                                                                                      | * Decrease Wash and Ream time        |



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