

DAFTAR ISI

| | Halaman |
|--|----------------|
| HALAMAN JUDUL | i |
| HALAMAN PENGESAHAN | ii |
| HALAMAN PERSEMPAHAN | iii |
| KATA PENGANTAR | iv |
| DAFTAR ISI | v |
| DAFTAR GAMBAR | vii |
| DAFTAR TABEL | viii |
| DAFTAR GRAFIK | ix |
| BAB I PENDAHULUAN | 1 |
| 1.1. Latar Belakang | 1 |
| 1.2. Tujuan | 2 |
| 1.3. Batasan Masalah | 2 |
| 1.4. Lokasi Penelitian | 2 |
| 1.5. Luaran Penelitian..... | 2 |
| 1.6. Manfaat Penelitian..... | 2 |
| BAB II TINJAUAN LAPANGAN DAN LANDASAN TEORI | 3 |
| 2.1 Tinjauan Lapangan | 3 |
| 2.2 Landasan Teori..... | 5 |
| 2.2.1. Menara Simulasi Pemboran Standar “VICOIL” | 5 |
| 2.2.2. <i>Rate of Penetration</i> | 14 |
| 2.2.3. Lumpur Pemboran | 17 |
| 2.2.4. <i>Bit</i> Pemboran | 34 |
| 2.2.5. <i>RPM</i> | 43 |
| 2.2.6. Batuan <i>Shale</i> | 45 |
| 2.2.7. <i>Problem Shale</i> dalam Operasi Pemboran | 51 |
| 2.2.8. Analisa <i>Cutting</i> | 53 |

DAFTAR ISI
(Lanjutan)

| | Halaman |
|---|----------------|
| BAB III Metodologi Penelitian | 54 |
| 3.1 Tahapan Penelitian | 54 |
| 3.2 Metode Penelitian | 55 |
| BAB IV PENGOLAHAN DAN PENYAJIAN DATA | 56 |
| 4.1 Pengolahan Data | 56 |
| 4.1.1. Pengukuran Nilai <i>Compressive Strength</i> | 56 |
| 4.1.2. Uji <i>X-ray Diffraction – Bulk Mineral</i> | 57 |
| 4.1.3. Uji <i>X-ray Diffraction – Clay Oriented</i> | 61 |
| 4.1.4. Uji <i>Methylene Blue Test</i> | 65 |
| 4.2 Penyajian Data | 68 |
| BAB V HASIL DAN PEMBAHASAN | 76 |
| BAB VI KESIMPULAN DAN SARAN | 80 |
| 6.1 Kesimpulan | 80 |
| 6.2 Saran | 80 |
| DAFTAR PUSTAKA | 81 |

DAFTAR GAMBAR

| | Halaman |
|--|----------------|
| Gambar 2.1. Tempat Penelitian | 3 |
| Gambar 2.2. Profil Sumur AYP-051 | 4 |
| Gambar 2.2. Menara Simulasi Pemboran Standar “VICOIL” | 5 |
| Gambar 2.3. Mesin Honda C70 | 6 |
| Gambar 2.4. Genset Dexta Cam Starter Tipe QS5-15P/3..... | 6 |
| Gambar 2.5. Dinamo Penggerak <i>Rotary Table</i> | 6 |
| Gambar 2.6. <i>Derrick</i> | 7 |
| Gambar 2.7. <i>Rig Floor</i> | 8 |
| Gambar 2.8. <i>Substructure</i> | 8 |
| Gambar 2.9. <i>Drawwork</i> | 9 |
| Gambar 2.10. <i>Overhead Tool</i> | 10 |
| Gambar 2.11. <i>Drilling Line</i> | 10 |
| Gambar 2.12. <i>Rotary Assembly</i> | 11 |
| Gambar 2.13. <i>Drillstring</i> | 11 |
| Gambar 2.14. <i>Bit</i> | 12 |
| Gambar 2.15. <i>Mud Tank</i> | 12 |
| Gambar 2.16. <i>Mud Pump</i> | 13 |
| Gambar 2.17. <i>Conditioning Area</i> | 13 |
| Gambar 2.18. <i>Mud Ballance</i> | 19 |
| Gambar 2.19. Plot Koordinat <i>Rectangular Viscositas vs Shear Rate</i> | 21 |
| Gambar 2.20. Plot Koordinat <i>Shear Stress vs Shear Rate</i> | 21 |
| Gambar 2.21. Faktor Mekanis | 35 |
| Gambar 2.22. <i>Drag Bit</i> | 36 |
| Gambar 2.23. <i>Roller Cone Bit</i> | 37 |
| Gambar 2.24. <i>Diamond Bit</i> | 38 |
| Gambar 2.25. <i>PDC Bit</i> | 39 |

DAFTAR GAMBAR

(Lanjutan)

| | |
|---|----|
| Gambar 2.26. <i>Penetration Rate VS Weight on Bit</i> | 42 |
| Gambar 2.27. <i>Penetration Rate VS Rotary Speed</i> | 44 |
| Gambar 2.28. Struktur dari Kaolinite | 47 |
| Gambar 2.30. Struktur dari Monmorillinite | 48 |
| Gambar 2.31. Struktur dari Illite | 49 |
| Gambar 3.1. Diagram Alir | 55 |
| Gambar 4.1. <i>Hydraulic Press</i> | 56 |
| Gambar 4.2. Rigaku XRD | 58 |
| Gambar 4.3.. Timbangan Sampel | 58 |
| Gambar 4.4. Prosedur Penggerusan Sampel <i>Cutting</i> | 59 |
| Gambar 4.5. <i>Sample Holder</i> | 59 |
| Gambar 4.6. Peletakan Sampel Holder ke Alat XRD..... | 59 |
| Gambar 4.7. Contoh Hasil Uji XRD | 60 |
| Gambar 4.8. Sampel <i>Cutting</i> | 62 |
| Gambar 4.9. Tabung Reaksi | 62 |
| Gambar 4.10. <i>Ultrasonic Cleaner</i> | 63 |
| Gambar 4.11. Sampel dan Penambahan NaOH | 63 |
| Gambar 4.12. Pengambilan Sampel Clay | 64 |

DAFTAR LAMPIRAN

| Lampiran | Halaman |
|--|----------------|
| A. Data Compressive Strength (CS) | 71 |
| B. Data Water Base Mud (WBM)..... | 73 |
| C. Data Rheology Sumur..... | 75 |
| D. Data Laju Penebusan..... | 76 |
| E. Data Rate Of Penetration (ROP) | 78 |

DAFTAR SINGKATAN DAN LAMBANG

| SINGKATAN | | Halaman |
|------------------|-------------------------|---------|
| MBT | Methylene Blue Test | 1 |
| WBM | Water Base Mud | 2 |
| ALP | Analisa Lumpur Pemboran | 24 |
| CCO | Coconut Crude Oil | 25 |
| ASP | Analisa Semen Pemboran | 26 |
| RPM | Rotation Per Minute | 27 |
| ROP | Rate of Penetration | 30 |
| OBM | Oil Base Mud | 31 |
| XRD | X-ray Diffraction | 31 |
| LAMBANG | | |
| C | Cost | 12 |
| P_r | Reservoir Pressure | 12 |
| P_{wh} | Pressure Well Head | 12 |
| Q | Fluid Rate | 13 |
| P_v | Present Value | 15 |
| P_v | Fluid Rate | 15 |
| Q_{max} | Maximum Fluid Rate | 15 |
| R | Revenue | 15 |
| P_{wf} | Well Flow Pressure | 15 |