

Drilling Waste Management Data Acquisition & Automation



single source, cradle to grave.....

**Drilling Fluids
& Waste Management
Solutions**



DWM - Automation & Data Acquisition

- Introduction
 - Data Acquisition
 - Variables
 - Real Time Monitor
 - Automated Daily Report
 - Analysis
 - Automation
 - Control Systems
 - Benefits
 - Equipment
 - Currently Available
 - Under Development



DWM - Data Acquisition

- Variables
 - What Can We Record
 - Waste Volumes
 - Density
 - Composition
 - Oil / Water / Solids
 - Pressures (DCI)
 - Batch Size
 - Drilling Parameters
- Real Time Monitoring
 - Remote Monitoring
 - Wireless Ethernet
 - Internet
- Automated Daily reports
 - Automatically generated
 - Duty of Care Reports
 - Chain of Custody
 - Where the waste came from
 - Where it was disposed



DWM - Data Acquisition

- Benefits / Advantages
 - Analysis
 - Generates **REAL** numbers
 - Compare Historical Data
 - Hole Washout
 - Hole Cleaning
 - Volumes Waste Generated
 - Cost of Treatment / Disposal
 - Compare treatment / disposal options
 - Planning
 - Precise Planning
 - Managing Logistics
 - Equipment Requirements
 - No. boxes required
 - Volume cement



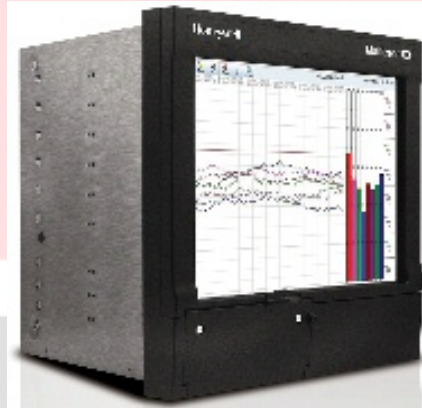
DWM - Automation

- Automation
 - PLC Controller Coupled with PC based HMI Interface
 - Remote Desktop PC
 - Wireless Laptop (Exp)
 - Ex-proof Touch Screen Interface
- Benefits
 - Improved Efficiency
 - Improved Reporting
 - Improved Planning
 - Reduced head count
- Training.....

DWM - Data Acquisition & Automation Equipment

- Processes
 - Present
 - DCI Data Acquisition
 - CBP 800 Data Acquisition & Automation
 - Thermal Desorption Process Plant Automation
 - Under Development
 - DCI Full Automation
 - Automated Tank Cleaning
 - Bulk transfer / Storage Automation
 - RFID Inventory Tagging
 - Completed Automated Solids Control & DWM System
 - Shakers
 - Desander & Desilter
 - Centrifuge
 - DWM
 - » Bulk Transfer & Transportation
 - » DCI
 - » De-watering / Flocculation

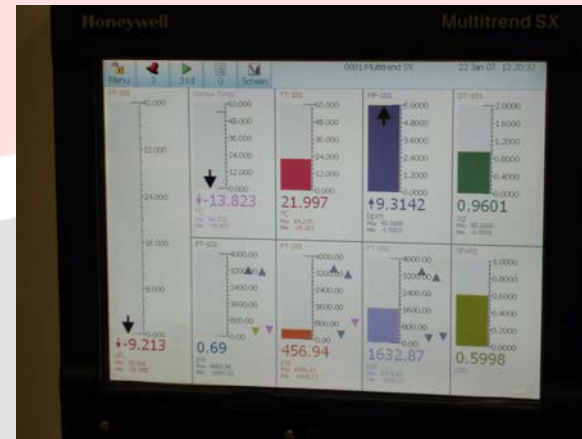
DWM – Drill Cuttings Injection Data Acquisition



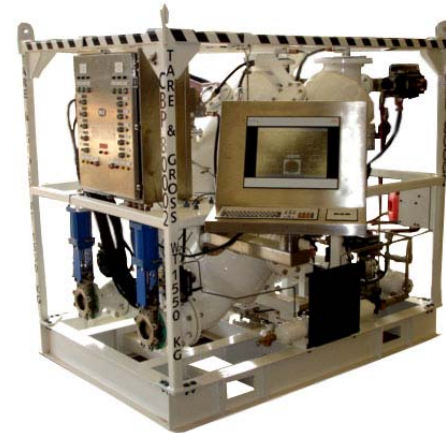
- Drilling Cutting Injection Data Acquisition
 - Measure the following variables:
 - Injection pressure of slurry from Triplex pump - 0 to 4000psi (0-300bar)
 - Flow rate of slurry from Triplex pump - 0 to 6 BPM (0-60 cum/hour)
 - Density of Slurry - 0 to 1.7sg (0 to 15lb/USGallon, 1800kg/cum)
 - Viscosity of slurry - 0 to 40 CP (0 to 100 Marsh/Sec's)
 - Temperature of slurry - 0 to 60°C
 - Annular Pressure A - 0 to 4000psi (0-300bar)
 - Annular Pressure B - 0 to 4000psi (0-300bar)

DWM - DCI Data Acquisition

- Instruments
- Data Recorder
- Pressure Sensor
- Temperature transmitter
- Mass Flow Meter
- Stroke Counter
- Viscosity Probe
 - Acoustic resonance
- Remote Laptop



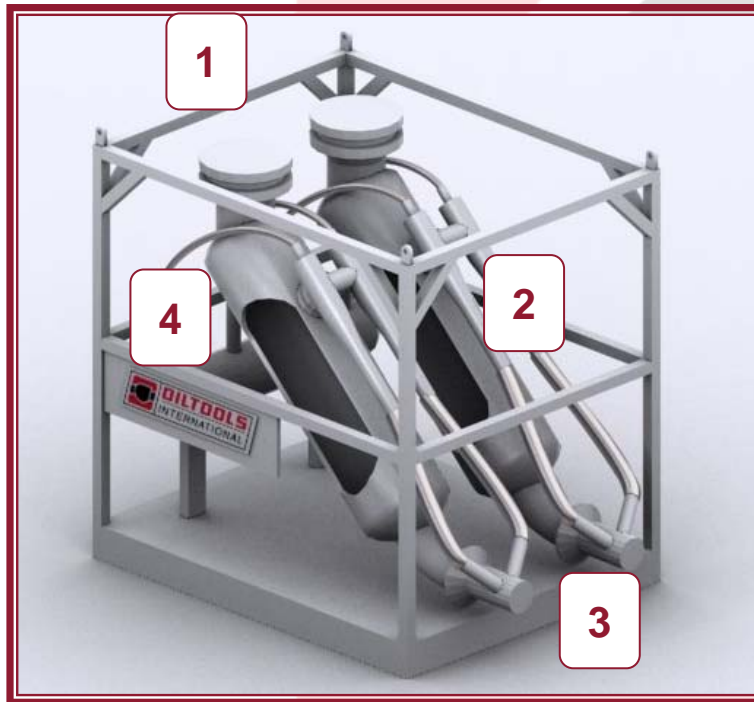
DWM - Automated Dense Phase Cuttings Conveyance



- **Cuttings Blowing Pump (CBP 800)**
 - Continuous Dense Phase Cuttings Conveyor
 - Slurries, Sludge's & Solids
 - Bulk transfer
 - Bulk storage tanks / containers
 - Boat / barge
 - On the rig
 - Capacity > 30 m³/hr
 - Vertical Discharge 50m (150ft)
 - Horizontal Discharge > 185m (550ft)

DWM - Automated Cuttings Dense Phase Conveyance

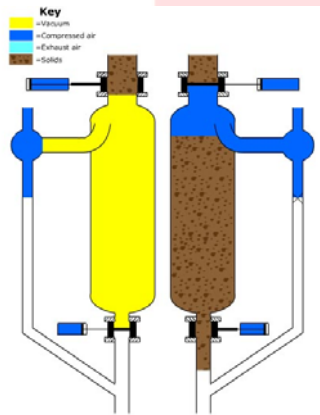
CBP 800 System Components



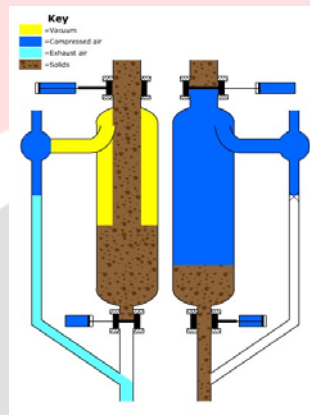
- **1 – 8” Inlet valve**
- **2 – Transfer Tanks**
- **3 – 4” Discharge Valve**
- **4 – Air Inlet**

Cuttings Blowing Pump 800

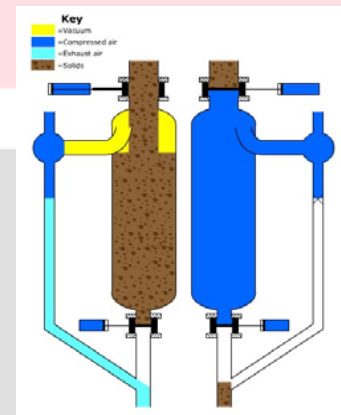
DWM - Automated Cuttings Dense Phase Conveyance



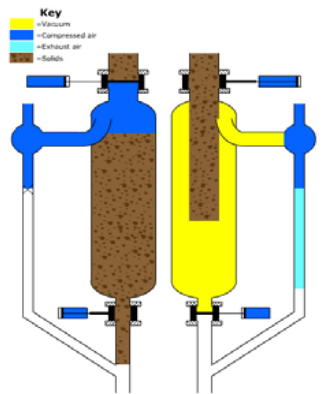
Tank # 1 – Fill Mode
Tank # 2 – Empty Mode



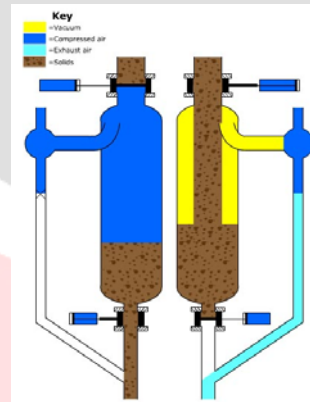
Tank #1 – Fills
Tank # 2 – Empties



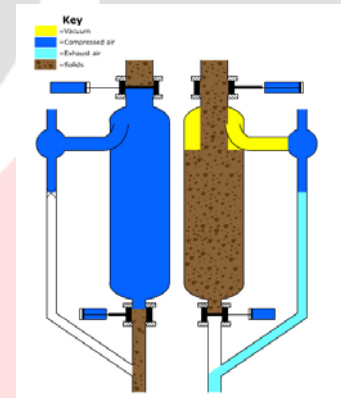
Tank # 1 – Full
Tank # 2 - Empty



Tank # 1 – Empty Mode
Tank # 2 – Fill Mode



Tank # 1 – Empties
Tank # 2 – Fills



Tank # 1 – Empty
Tank # 2 – Full

DWM - Automated Cuttings Dense Phase Conveyance

CBP 800 Automation

- Programmable Logic controller
 - Manually
 - Timer
 - Auto Feedback
 - Load cells
 - Level Switch
 - Pressure
 - Time
 - Data Acquisition
 - Volume
 - Weight
 - No Slugs
- HMI
 - Touch screen PC Control
 - Wireless Laptop Control



DWM - Automated Cuttings Dense Phase Conveyance

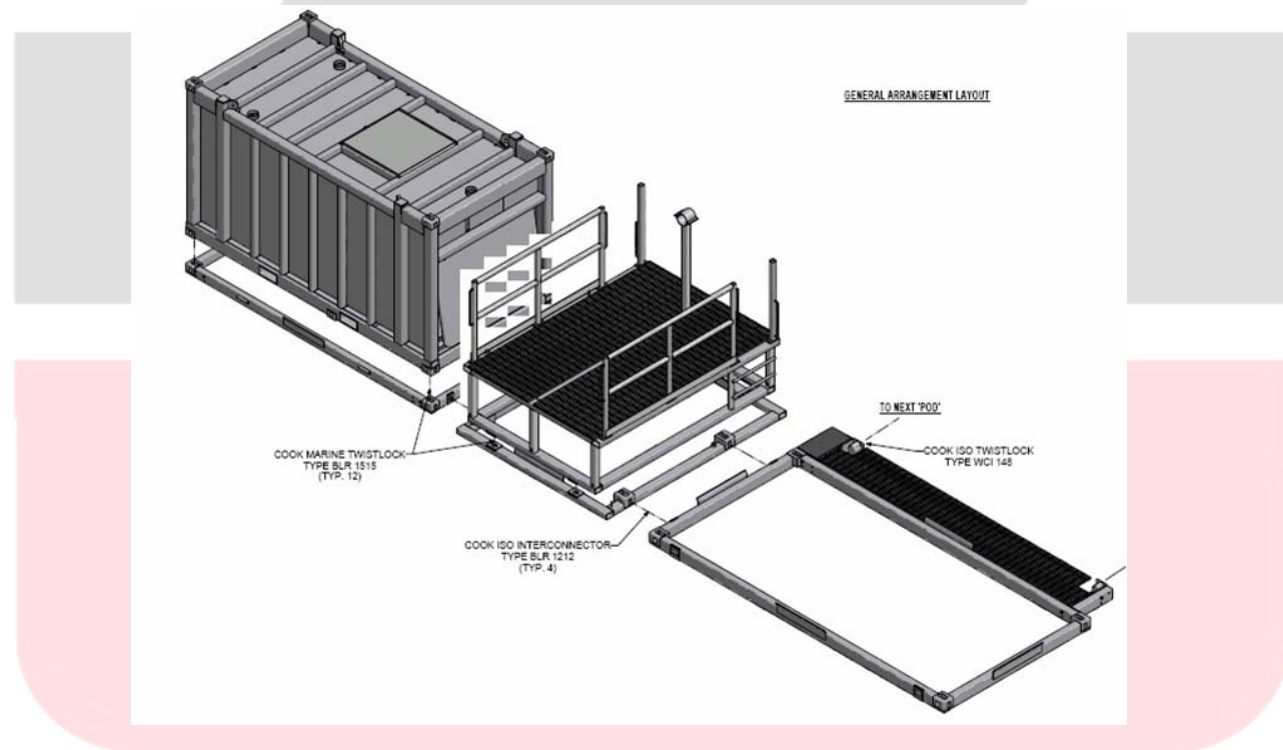
DWM - Automated Cuttings Dense Phase Conveyance

- CBP 800 Transport & Containment System
 - Feed Conveyor
 - Cuttings Surge Tank (On rig)
 - CBP 800
 - 900 cfm Compressor
 - Air Storage Tank
 - Bulk Tanks / Cuttings Boxes
- Currently 9 units in Operation
 - Norway
 - UK
 - Thermal Desorption Plant



DWM – Bulk Storage & Transfer

- Bulk Storage / Transportation
 - 18 DNV Bulk Storage Containers
 - Capacity 18mt (System Capacity 325mt)
 - Non Pressurised
 - Secured with ISO Locks
 - No Moving Parts



DWM – Bulk Storage & Transfer





DWM – Bulk Storage & Transfer

- Bulk System Full Automation
 - PLC Controlled System
 - CBP 800
 - Automatic Tank Selection
 - Selects Tank
 - Records Volume Pump
 - Close Tank Once Full
 - Radio Frequency Identification (RFID)
 - Tags each tanks
 - » Date
 - » Rig & Well
 - » Section Drilled
 - » Volume

DWM – Automated Tank Cleaning

- Automated Tank Cleaning
 - Permanent
 - Portable
 - Touch screen HMI Controller
 - Reduce Tank Cleaning Time
 - 30 min – WBM
 - 1-2hrs – OBM
 - Reduce Tank Entry / Confined Space
 - Reduce Waste Generated



DWM – Drill Cuttings Injection Automation

- Drill Cuttings Injection Automation
 - PLC control
 - Monitors slurry viscosity, density
 - Volumes Pumped
 - Slurries
 - Water
 - Monitors Pressure
 - Injection pressure
 - Annulus pressure
 - Full automated injection pump
 - Remote Real Time Monitoring

