Innovative West Texas Remote Water Treatment Analysis & Telemetry

TURNER DESIGNS
Hydrocarbon Instruments

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Low Cost, Robust, Easy to Operate & Commission

Major Measurement Issues

- Remote Locations
- High Oil Concentrations
- Multiple Operators / Water Transfer
- No two processes are the same
- Iron interference with Frac Chemicals

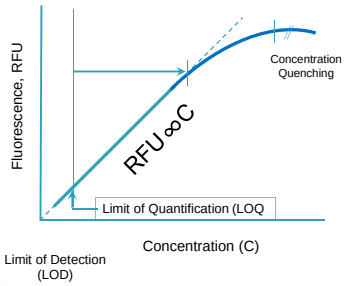
Where are the Monitors Used

- Oil Field Produced Water
  - Discharge Monitoring
  - Process Control
- SWD
  - Upset Monitoring
  - Process Optimization
- Water Recycling
  - Water Analysis
  - Automatic Sample Collection

West TX Oil in Water Measurement Challenges

- Normal Conditions
  - 0-500 ppm
  - Solids
  - Remote Location
- Upset Conditions
  - > 1% Oil
  - High Solids

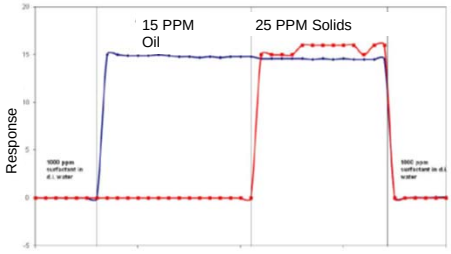
Fluorescence vs Concentration



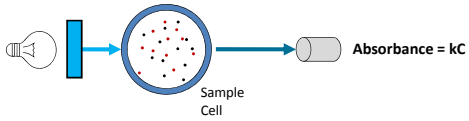
Typical Fluorescence Range

- Normal Conditions
  - 0-5000 ppm
    - Quick Sample Analysis
    - Manual Operation
  - 0-1000 ppm
    - On line Range
    - Inherently Low Maintenance

Fluorescence v Particle Detection

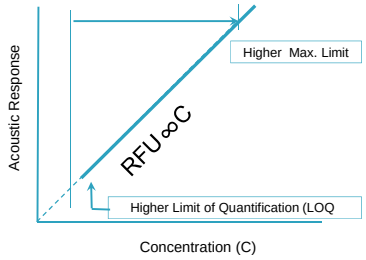


Light Absorption



- Oil Droplet
- Solid Particle

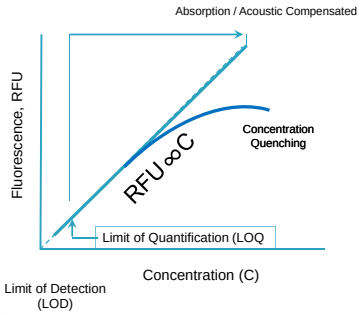
Absorption / Acoustic vs Concentration



Typical Ultrasonic Range

- Normal Conditions
  - 100 – 10,000 ppm (1%)
    - On line Range
    - No significant solids
    - No Significant Gas

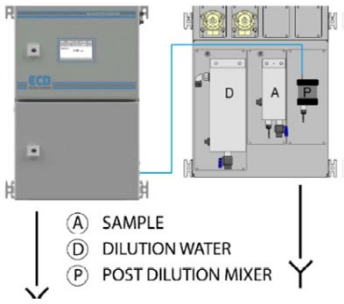
Extended Fluorescence vs Concentration



West TX Iron Analysis Challenges

- Concentration Range
  - 0-6ppm or 0-60 ppm
- Remote Sites
- Few Utilities
- Occasional Maintenance
- Common Analysis
  - Manual
  - Hourly / Daily samples
  - Reagent Based

West TX Iron Analysis Challenges

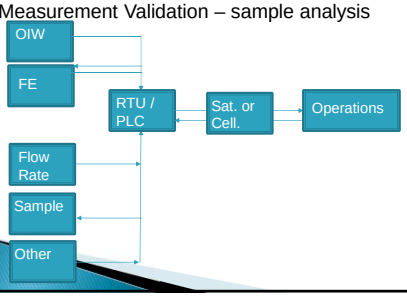


West TX Iron Analysis Solution

- On Line Analysis Range
  - 0-6 ppm or 0-60 ppm
- Same reagent & analysis as sample
- Controlled Dilution
- Significant reduction in consumables

West TX Analysis Telemetry

- Two Way communication to demand sample analysis or collection.
- Measurement Validation – sample analysis



Thank you!!
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