Establishing a System of Record for Wellbore Schematics

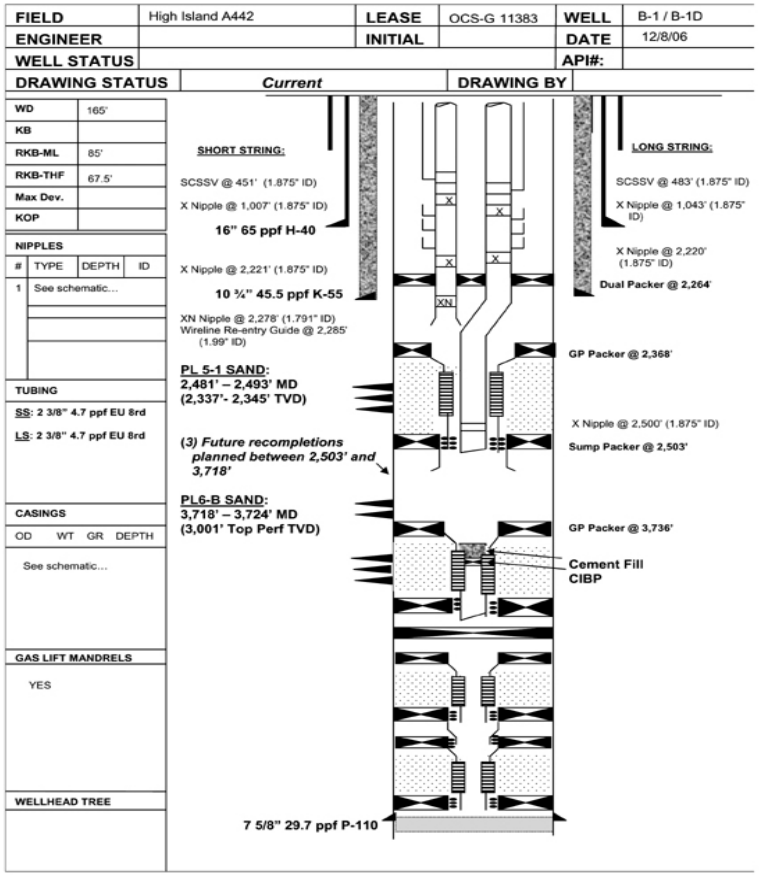
SPE LUNCHEON, JANUARY 21, 2015

NOAH CONSULTING

Agenda

- What is a Wellbore schematic
- Capturing Wellbore Data
- Establishing a system of record
- Current State of Schematics
- Schematics and the Government
- What is WellView
- The Data Clean up Process
- Developing a Schematic template
- Regulatory Acceptance
- Future State Processes
- Lessons Learned / Best Practices

What is a Wellbore Schematic



An informative drawing of what is in the well

Used to make key decisions about the well

Documents future completion opportunities

They are not always accurate

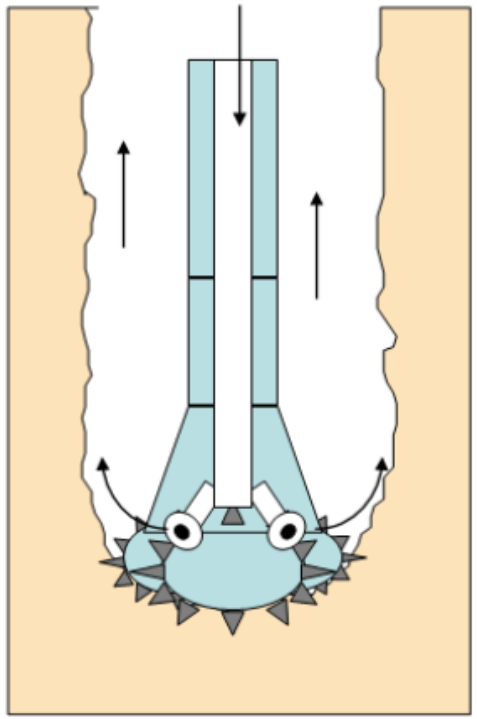
Can be incomplete

Static

Capturing Wellbore Data

- Drilling New Wells
- Major Rig Workovers
- Minor Rig Workovers
- Routine Maintenance (Slick line / wireline work)
- Well abandonment

- How many systems are there?
- Local Spreadsheets
- Hand written notes
- Vendor data



Establishing a system of record

Desire to have a system to manage all wellbore schematics

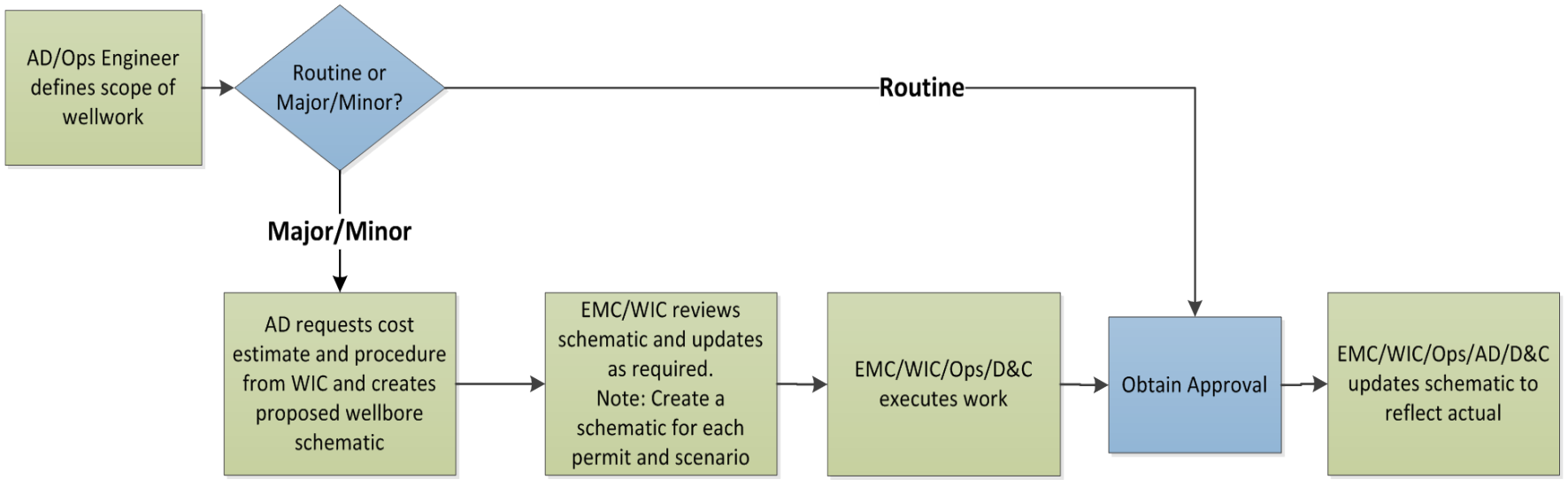
- Information in multiple locations
- Need for current information
- Need for consistent, standard and complete information
- Need a central repository

Desired Outcomes

- Wellview will become a repository for complete wellbore schematic information
- Operations, AD engineers, and field sites will always have the same schematic
- Regulatory agencies will permit using WellView schematics
- Standard data entry processes for schematic information will be developed and implemented

Current State of Schematics

Current State Process
Sustain Wellbore Schematics



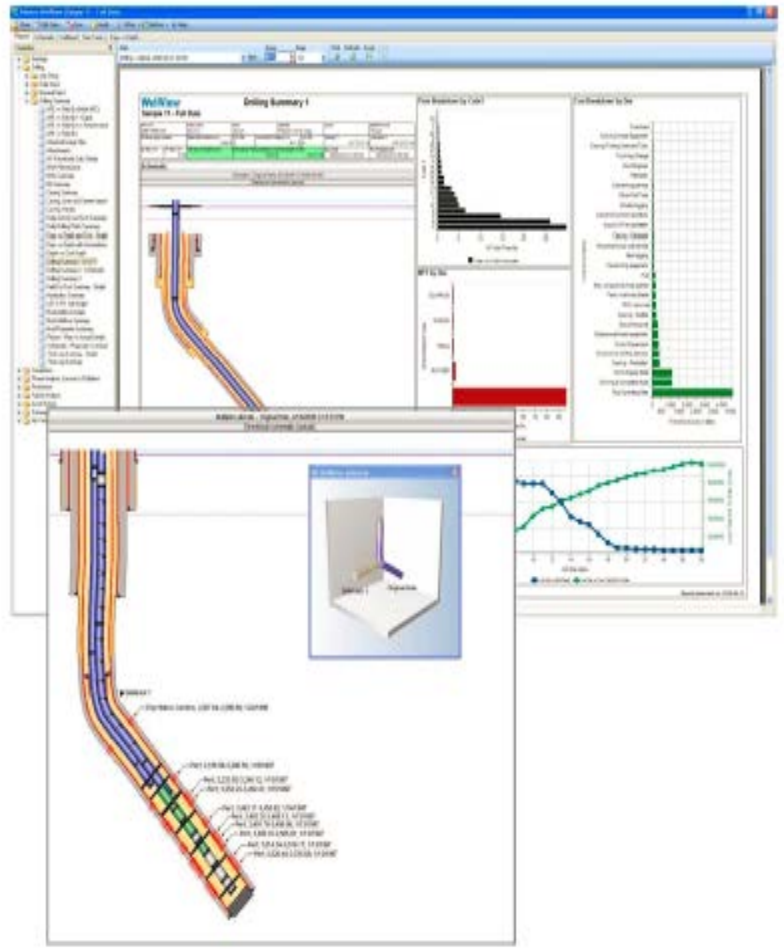
Schematics and the Government

- Schematics have to be submitted to the Bureau of Safety and Environmental Enforcement and/or the Bureau of Ocean Energy Management, Regulation and Enforcement for approval
- Had multiple meetings with officials in various regulatory offices
- Feedback was that they receive multiple formats and no consistency from engineer to engineer
- Eager to see if we could provide standards related to schematics

noah CONSULTING

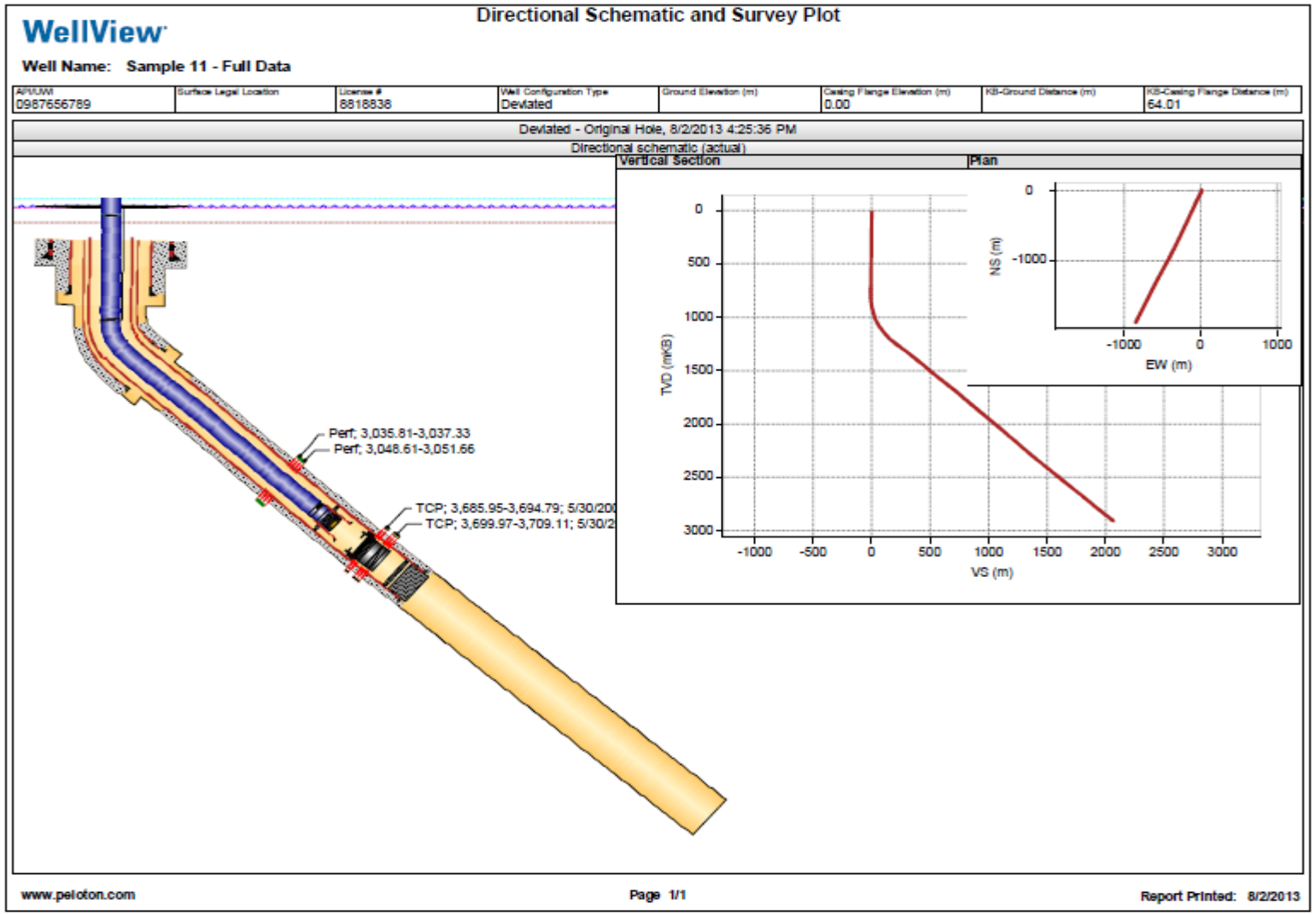
What is WellView

- WellView is a well lifecycle system
- Interactive morning reporting for drilling
- Well data management and query flexibility
- Drilling data visualization
- Drilling data and performance analysis
- Interactive morning reporting for completion
- and well intervention
- Wellbore schematic and well intervention visualization
- Electronic well file
- Performance, cost, and failure analysis

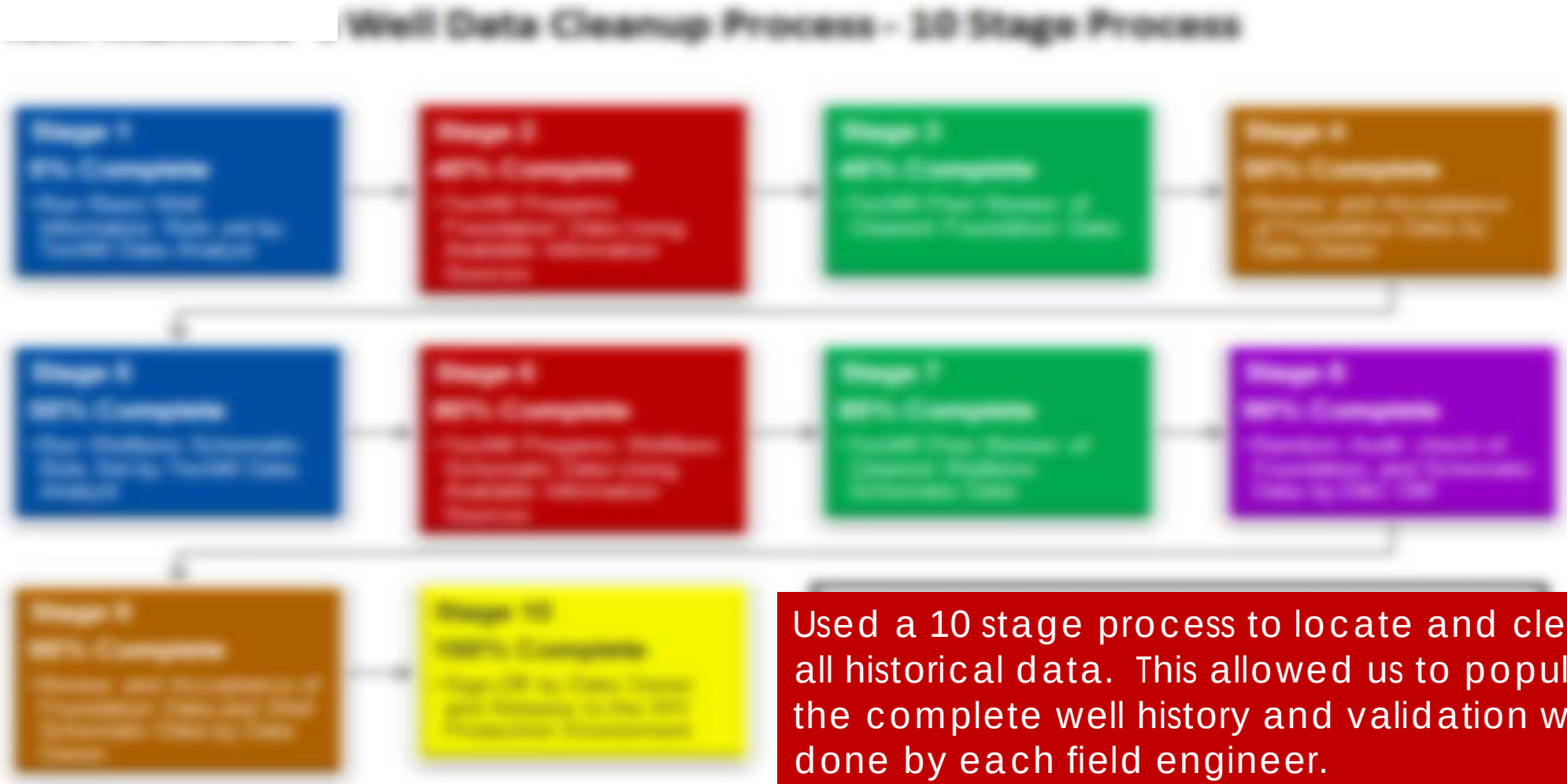


noah CONSULTING

WellView Features

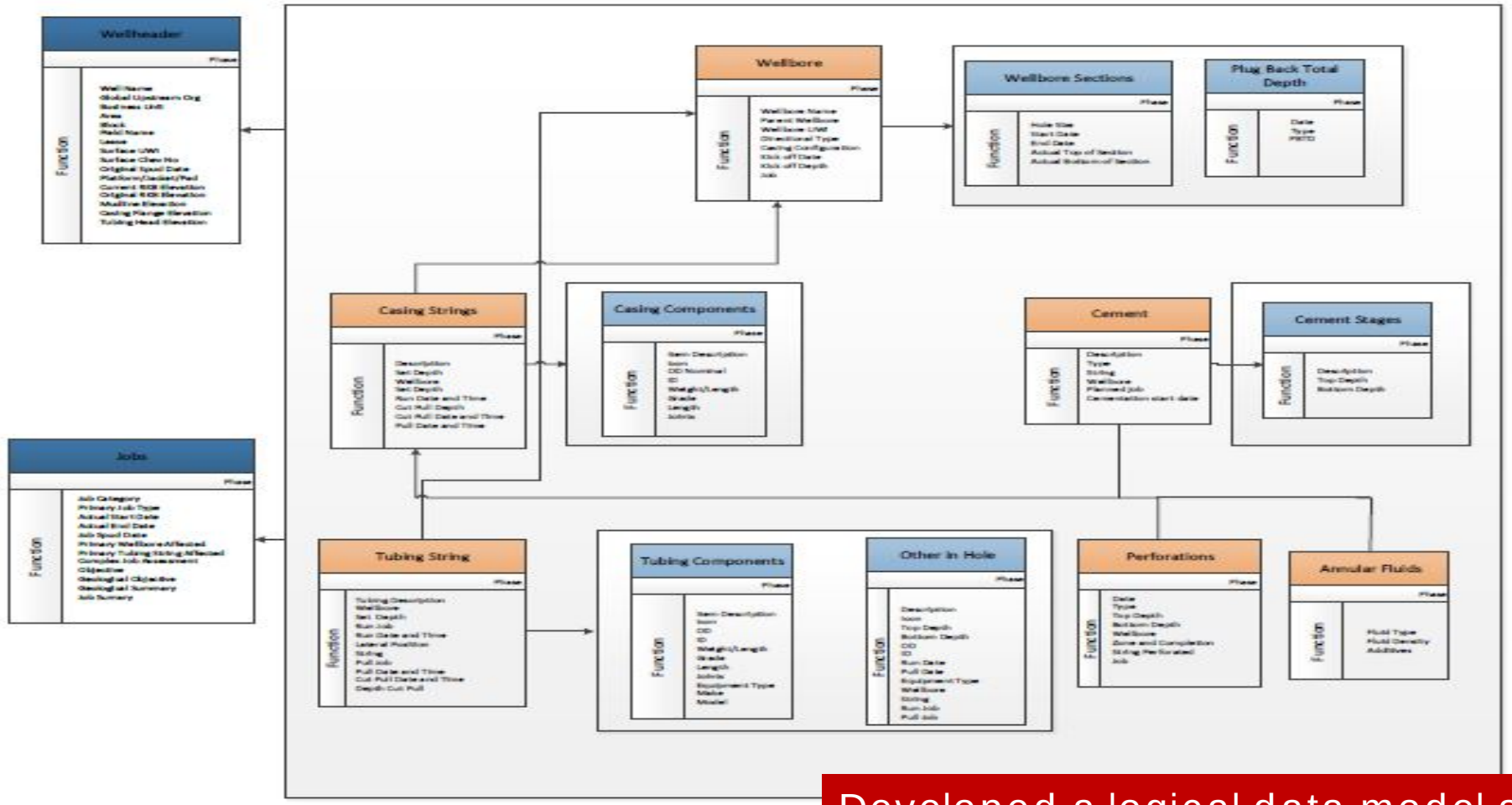


The Data Clean up Process



Used a 10 stage process to locate and clean up all historical data. This allowed us to populate the complete well history and validation was done by each field engineer.

Logical Data Model



Developed a logical data model as a roadmap to define all critical data to be captured based on regulatory expectations.

Developing a Schematic template

- Change Management –
  - “My Visio schematic works just fine”
  - “WellView can’t do what I need it to do”

We had to work side by side and show them the value of Wellview and the value of having one repository for data

We allowed them to help build the schematic templates so it was not a “push” from corporate but a “let’s see if this can work” approach

Doing side-by-side comparisons with their old schematics and building ‘like for like’ schematics in WellView helped engineers see that WellView would give them the same information

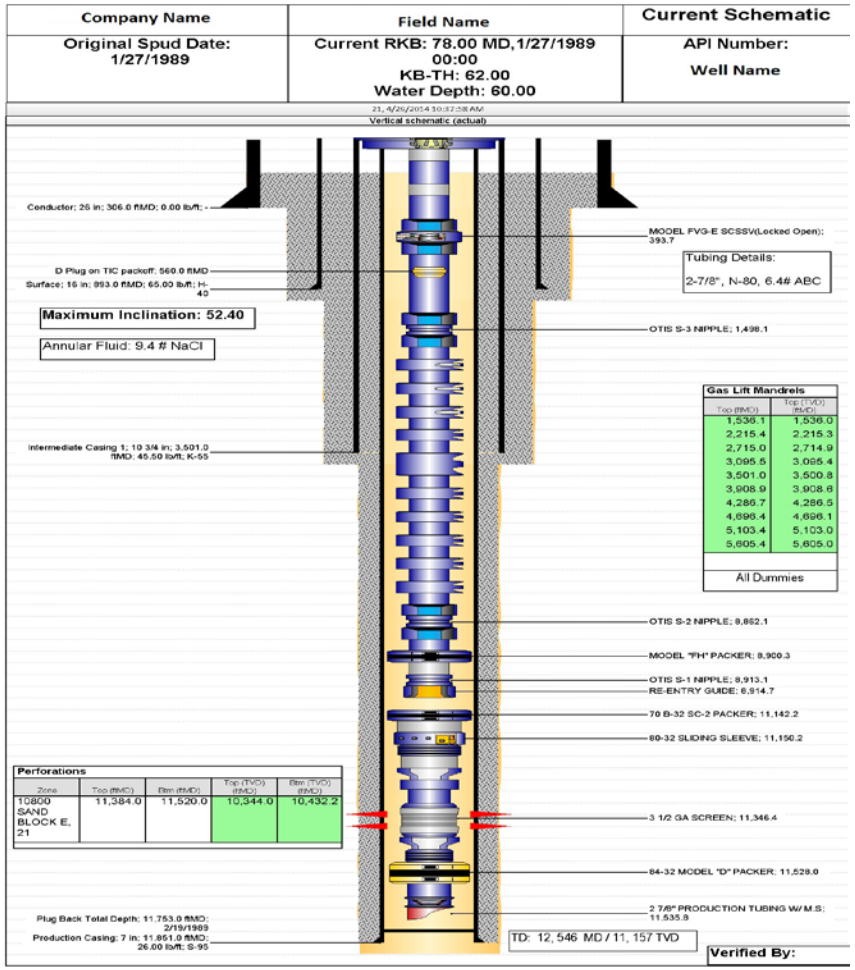
Showed the value of a central database and the value of the office, and the field looking at the most current schematic at all times

Regulatory Acceptance

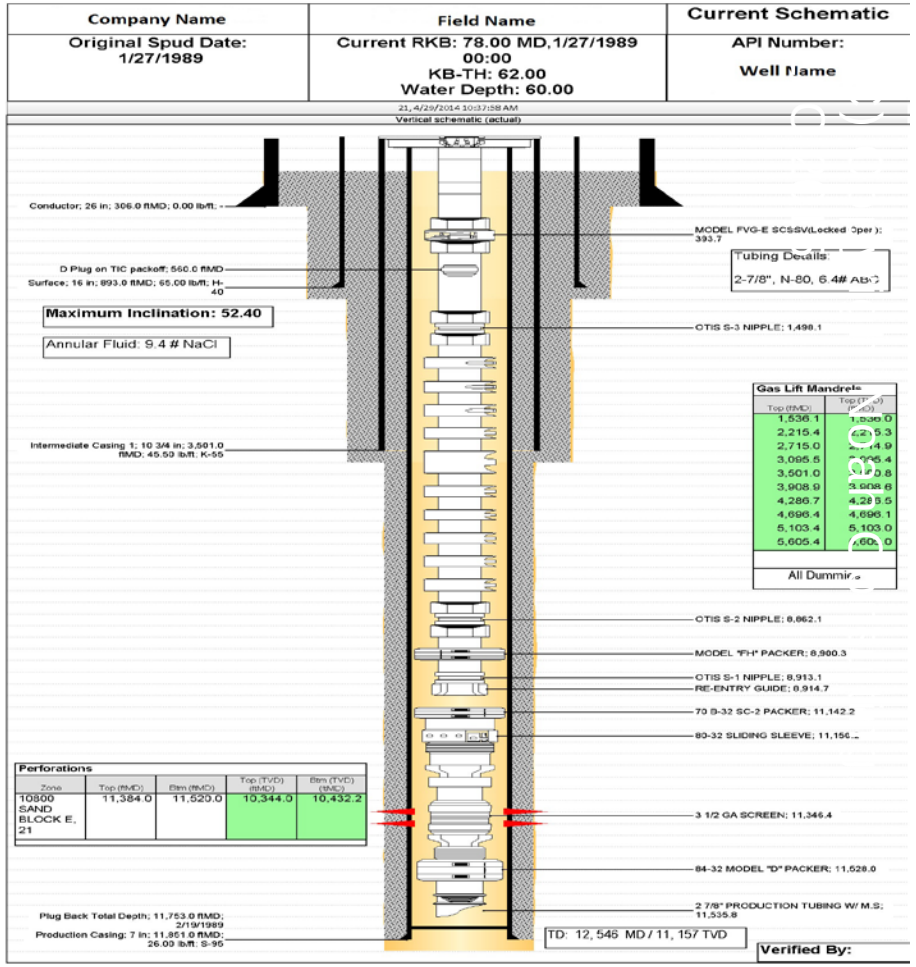
- Asset Development and Operations engineers approved the schematic data and the drawing
- Submitted the workover package including the schematic to regulatory
- BSEE approved our first submittal
- No rework was required

WellView Schematic Template

Color Schematic



Wireframe Schematic



Future State Processes

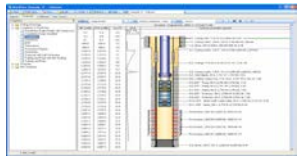
Lean Sigma

Project Management Methodology

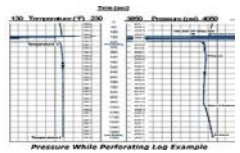
Created detail work flows for the following:

- New Drill
- Major Rig Workover
- Maintenance
- Abandonment

Sustainment and Governance

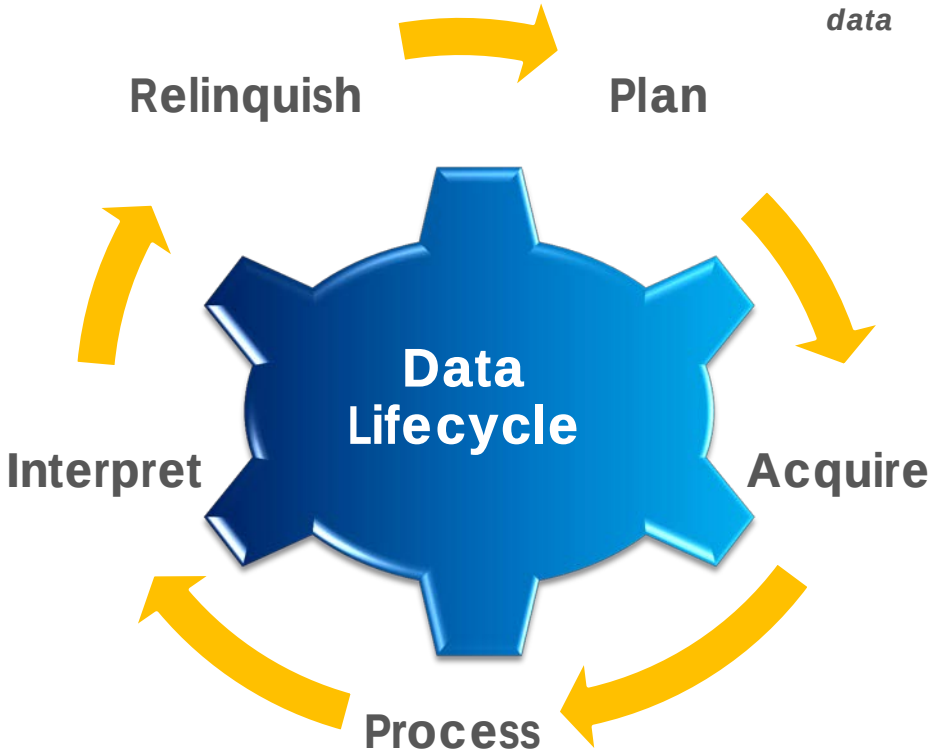


Follow documented procedures to update the WellView data and generate schematics



Validate the WellView Data using defined business rules and data governance

Develop and implement the process for WellView Data cleanup

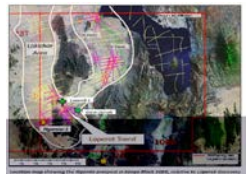


Perform analysis, clean and maintain WellView data in order to have a trusted and complete set of data

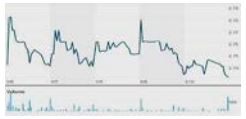
Load and clean WellView data based on data quality dimensions and business rule catalog

Sustainment and Governance

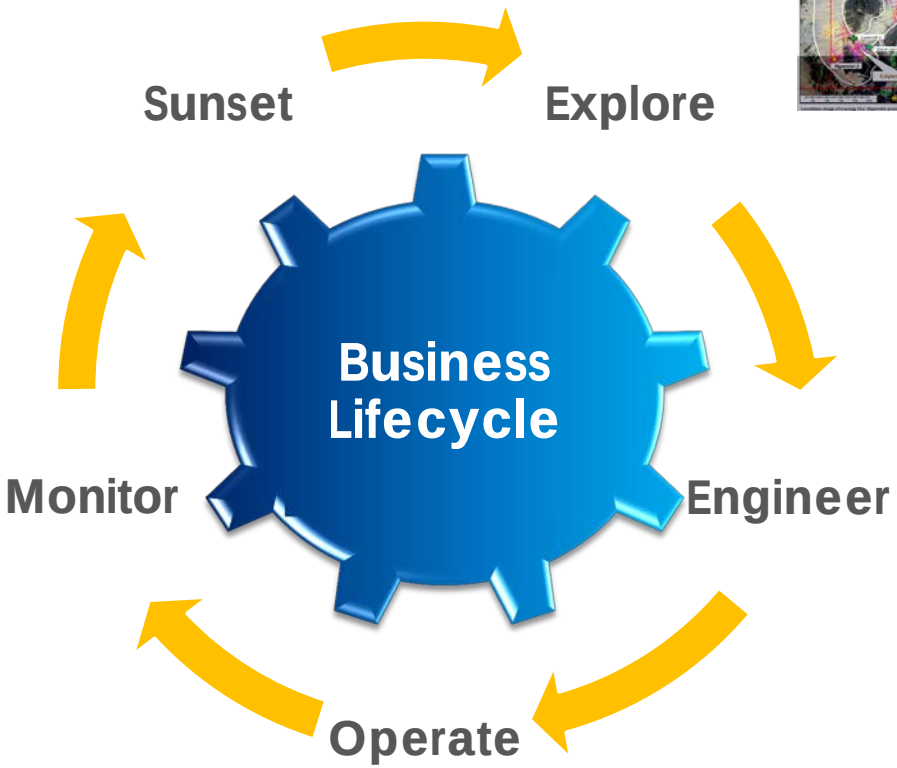
Decrease workover cost due to inaccurate wellbore schematics



Explore different data types and perform QC to identify inaccurate data which causes inaccurate wellbore schematics



Metrics and KPI's in place to audit data quality and accuracy of historical and current data in WellView



Use wellbore schematics in all well work to make informed decisions and submit schematics to Regulatory Agencies

Generate data driven schematics from WellView and not manual drawings using multiple applications

Lessons Learned / Best Practices

Lessons Learned

- Develop a key components checklist for Schematic
- Capture type, model, make, grade, weight for all components
- Schedule time with engineers to review and validate data
- Ensure side by side comparison done before engaging engineers
- Do not assume all data is where it should be
- Do not assume the information on the historical schematic is 100% accurate

Best Practices

- Create knowledge document and keep on SharePoint and updated real time
- Upload missing documents to corporate data repository when found during cleanup
- Coordinate with Asset teams on workovers
- Gain consensus on standard set of icons to be used
- Standard placement of information on the schematic

noah CONSULTING

Questions?

Contact: Curley Thomas, Noah Consulting

curley.thomas@noah-consulting.com

832-299-9534