Enhancing Oilfield Efficiency with Interactive Maps and Pressure Simulations

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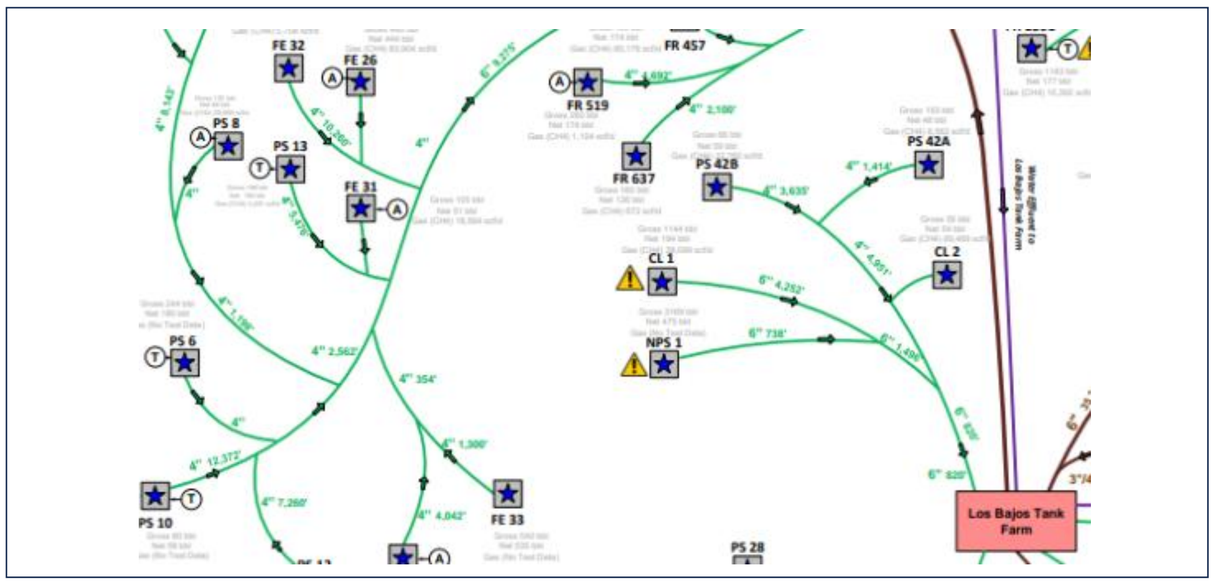
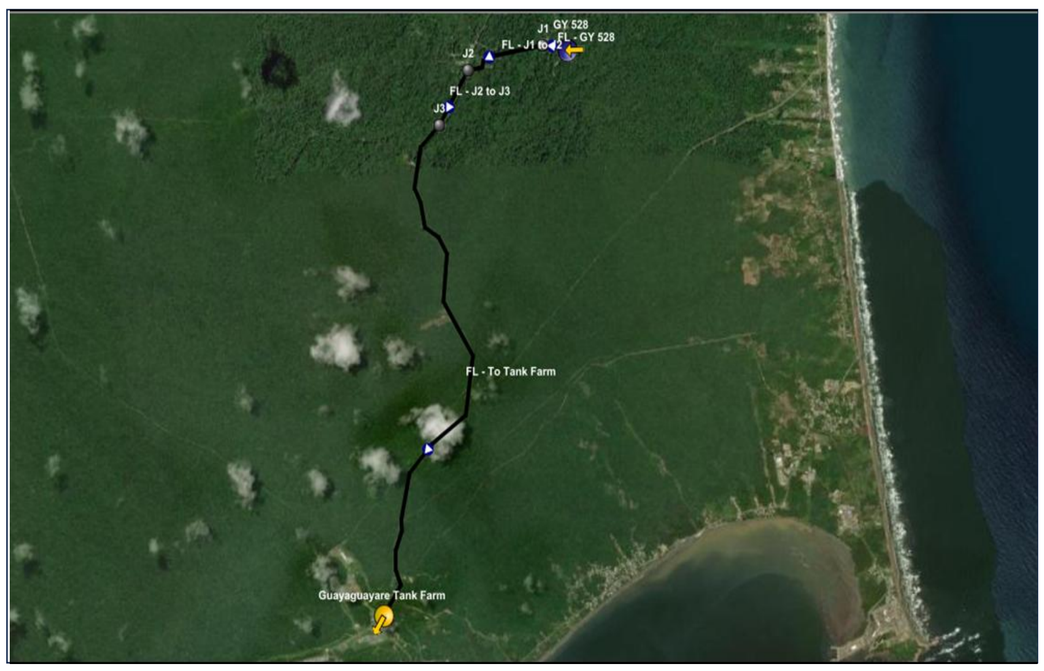
Priority Topic Area: **Digitalisation, including Cybersecurity**

1 – Aim

This project was designed to develop an interactive, map-based data management system for Heritage, revamping data accessibility, enhancing operational efficiency, and advancing environmental sustainability. In parallel, pressure profile simulations were conducted across all 109 tank batteries to pinpoint vulnerabilities within the pipeline network, mitigate leak risks, and optimize operations, ultimately driving a reduction in carbon emissions.





2 – Methodology

1. Interactive Map Development

- Develop a map to depict the entire oil pipeline network.
- Embed process descriptions, Piping & Instrumentation Diagrams, electrical and mechanical data, bund information, and on-site imagery, creating a seamless, one-click access point for critical operational data.
- Enable retrieval of essential information while ensuring data integrity through built-in revision tracking, eliminating data loss concerns.

2. Simulation & Risk Mitigation

- Conduct pressure profile simulations across 108 tank batteries to assess pressure fluctuations throughout the pipeline network.
- Identify weak points in the system with the highest likelihood of leaks or Loss of Primary Containment, allowing for targeted mitigation strategies.

3 – Outputs

- Interactive Map: A comprehensive visual representation of the process, including technical data.
- Pressure Profile Analysis: A detailed simulation report highlighting vulnerable sections in the pipeline system.
- Data Rationalization Strategy: Recommendations for battery optimization to reduce emissions and improve operational safety.
- Insights and Way Forward: Actionable insights to enhance tank battery performance, minimize venting at gathering stations, and drive reductions in carbon emissions. An analysis was also conducted to evaluate potential wellhead impacts resulting from pressure variations.

4 – Corporate and Environmental Benefits

- By optimizing battery operations, the project reduces unnecessary gas venting, directly lowering carbon emissions.
- Identifying weak points in the pipeline system prevents leaks and potential hazards, enhancing workplace and residential safety.
- The clickable map prevents data loss, improving decision-making and reducing downtime.
- Proactive maintenance and leak prevention lower repair costs and improve asset longevity.

5 – Next steps

- **Carbon Capture Initiatives:** Explore innovative solutions to capture and repurpose vented gases, minimizing atmospheric emissions and enhancing sustainability.
- **Field Optimization & Production Impact:** Conduct further analysis to refine field operations, assessing their influence on well performance and overall production efficiency.

References/Acknowledgements

Heritage Petroleum Company Ltd