

CypherCrescent E&P Services

Collaboration Towards End-to-End Asset Management to
Maximize Production & Profitability





Welcome

The key aspiration of every E&P company is to maximise production and profitability. We are delighted you are considering us as a partner in your quest to meet this critical objective. Our E&P services are designed to address key impediments to efficient asset management, thus making it easier for teams to actualise set goals.

Our suites of asset management solutions and services have been designed to address the challenges with difficulty in accessing validated and reliable data for data-to-day decision making, lack of access to the right technologies that provide operational leverage that maximises the reliability and availability of assets, and paucity of funds for re-entry activities and asset development programs. The adoption of these solutions and services is guaranteed to revolutionise your team's approach to asset management. Our team of industry experts are equipped to assist your team with several petroleum engineering studies to drive production enhancement and the embedment of asset management best practices. In collaboration with our partners, we also have an asset funding service that your team can leverage on if required.

Should your asset team have unique needs that are not currently captured in our solutions and services portfolio, our team of petroleum engineers, research engineering and software developers are available to co-create tailored solutions to these unique needs. Welcome aboard as we provide additional details on our service offerings.



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ASSET MANAGEMENT TECHNOLOGY

SEPAL WELL AND RESERVOIR MANAGEMENT SOLUTION (SEPAL WRM)



SECTION ONE:
**Introducing
CypherCrescent
E & P Services**



CypherCrescent's E&P Services

CypherCrescent E & P Services aims to collaborate with our valued clients to drive production increase, constant asset performance surveillance, operating cost reduction, and improved operational efficiency. Central to this is an active engagement and synergy with clients to understand their unique operational challenges. Suitable solutions and services are thereafter tailored to address these unique needs and challenges. Driving these solutions and services are seasoned experts, with decades of experience

Our E&P products and services offerings include:



Development of Asset Management Software Solutions



Data Democratisation Services



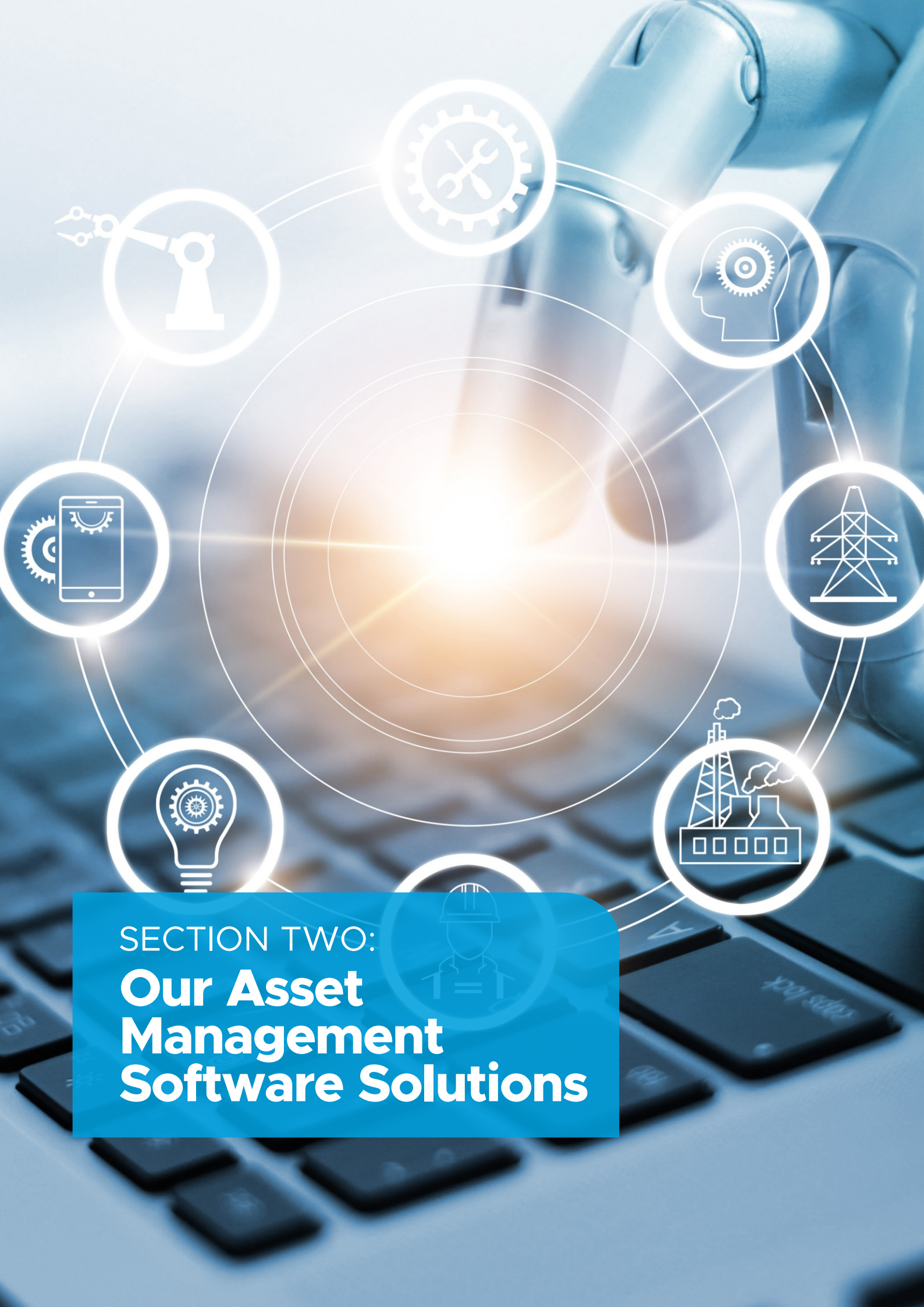
Petroleum Engineering Studies



Asset Management Operations

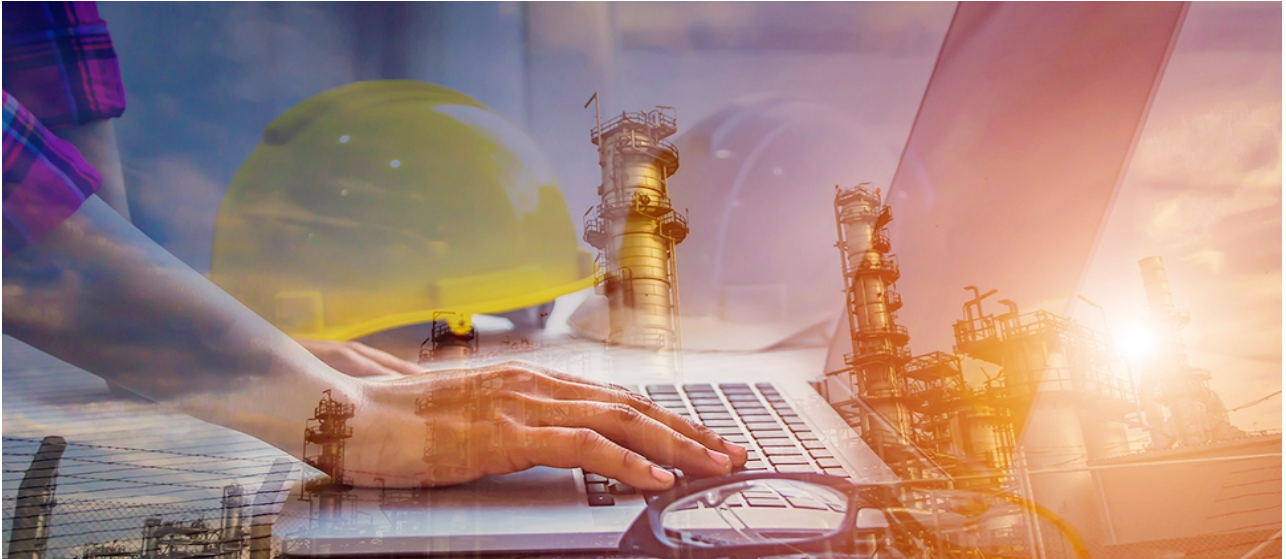


Project Financing



SECTION TWO:

Our Asset Management Software Solutions



Co-Creation and Provision of Asset Management Software Solutions

We provide proprietary innovative suite of software that E&P operators can leverage to achieve their four key asset management objectives:

- Enhance production
- Reduce cost
- Enhance efficiency
- Improve HSE

Our asset management technologies are invaluable to E&P operators in the management of WRFM surveillance data, analytics to automated short-term oil & gas opportunities generation, well and reservoir performance analysis, data-driven production forecasting, well integrity management, and business efficiency evaluation.

Some of our Innovative Integrated Asset Management Solutions (co-created with renowned energy companies in Nigeria) include:



These solutions and their value propositions will be discussed in subsequent sections

Asset Management Technology 1

SEPAL Well and Reservoir Management Solution (SEPAL WRM)



SEPAL WRM is an innovative well and reservoir management, digitalisation, and collaboration technology developed by CypherCrescent. It supports enterprise data integration (EDI) of WRM discipline data from different sources and provides a unified platform to manage, access, visualise and analyse all this information for informed business decisions.

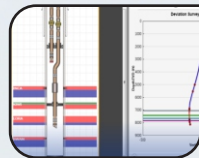
General Introduction

01



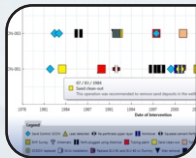
Well Schematics

02



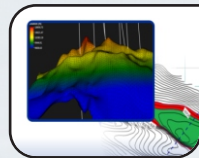
Intervention Management

03



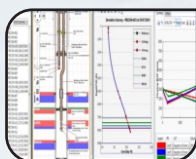
Geological Map Visualisation

04



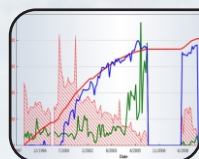
Well Modelling

05



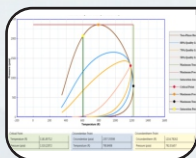
Production Analysis

06



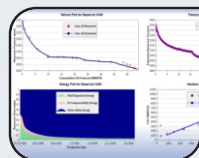
PVT Analysis

07



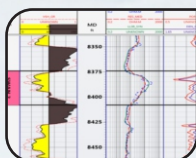
Reservoir Modelling

08



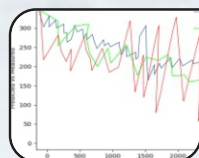
Petrophysics

09



Machine Learning CDA

10





Value Proposition

SEPAL WRM provides a three-fold value-addition to the asset management experience of clients through:

- improved management of well engineering and performance data (schematics, intervention histories, petrophysical logs, models etc.) and reservoir performance data (volumes, models, fluid contacts, etc.) in a single digital repository
- enhanced access to asset information with ability to quickly query large and complex database in addition with embedment of natural language processing (NLP-based) assistant to aid information extraction
- quick well reviews and identification of opportunities for production optimisation

INTEGRATE
Well & reservoir multi-discipline interpretations

COLLABORATE
Promotes teamwork, and breaks down functional silos

OPTIMISE
Automate and optimise asset management processes

Data Integration

- Create unified database for well and reservoir management
- Spot and resolve data inconsistencies across disciplines
- Establish a single source of truth for WRFM reviews

Team Collaboration

- Enhance teamwork and discourage functional silos
- Operationalise a shared database across team members
- Access WRFM data at anytime and from any location

Process Optimisation

- Drive WRFM reviews with embedded analytics
- Automate workflows to support quick decision making

Notable gains for users of SEPAL WRM include:

- enhanced well & reservoir data availability, accessibility, reliability, and visualisation
- deeper understanding of well & reservoir performance for optimum recovery
- improved success rate of well intervention activities through reliable data analytics
- enhanced well integrity management
- improved efficiency of well & reservoir management

Actively being used by these companies to drive effective well and reservoir management



General Manager, Operations at Eroton:

Automated review of assets has tremendously helped us achieve one of the lowest unit operating costs (UOC) in the industry. Thanks to SEPAL WRM.

Manager, Data Management at NPDC:



Our data are now connected. SEPAL WRM has provided us with the ability for everyone within the company to access the information that they need at the time they need it.





“
Production forecasting just got better”

Asset Management Technology 2

SEPAL Business Forecasting Solution (SEPAL BFS)



SEPAL Business Forecasting Solution (SEPAL BFS) is a volume-based production forecasting tool developed with CypherCrescent's proprietary technology – SEPAL. It enables seamless generation of realistic business forecasts associated with integrated production systems within the ambits of commercial, regulatory, economic and production availability constraints.

Value Proposition

- Transparency, repeatability, and auditability in assigning prioritisation to well streams
- Run multiple forecast scenarios to optimise production and business plan implementation
- Improve asset investment decision as deduced from forecast
- Set up robust forecast to generate time-stamped forecast results
- Robust economic/profitability evaluation using various fiscal regimes (e.g., embedded are Nigeria's PPTA and PIA fiscal terms)

Actively being used by these companies to drive representative business forecasts

Testimonial

SPE-203736: “The development and use of the tool greatly reduced turn-around time for generation of forecast and enabled the generation of multiple output in a short turn-around time. The tool in addition generates more realistic and robust forecast that honours all defined constraints and gives a more holistic view of the business performance based on current plan and realities.”

Asset Management Technology 3

SEPAL Drilling and Intervention Activities Planner (SEPAL DIAP)



SEPAL Drilling and Intervention Activity Planner is an innovative digital sequence optimisation solution, designed to help E&P companies manage their integrated well activities schedule effectively and efficiently. The collaborative platform enables critical stakeholders and teams to co-create activities schedule, track the schedules, monitor the execution, and control the integrated activities efficiently and effectively, greatly simplifying scheduling complexities, increasing the probability of success and minimising time and cost overruns.



Value Proposition

- Easy and rapid scheduling of well intervention, workover, and drilling projects.
- Seamless management of schedules evolutions.
- Effective collaboration and co-creation, management, and execution of operations schedule.
- Enterprise-wide visibility & collaboration for daily wellsite operations planning and execution.
- Efficient tracking with alerts and notification systems
- Reduced non-productive time or idling of critical well equipment.
- Easy implementation of "what-if" scenario analysis.



Actively being used by Agip to drive seamless drilling, workover, and intervention activities planning and tracking, with other clients in the horizon.



Asset Management Technology 4

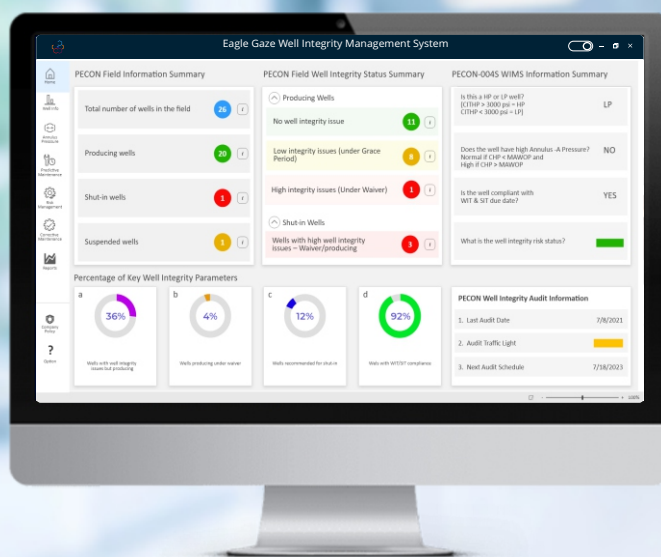


EAGLE GAZE Well Integrity Management System (WIMS)

CypherCrescent's well integrity management system (EAGLE GAZE WIMS) provides an integrated framework that incorporates technical, operational, and organisational efficiency to mitigate well integrity failure in the operate phase. It was designed in line with NORSOK-D010 and ISO 16530-2 well integrity standards for operate phase.

Value Proposition

- Digital repository for well integrity and annulus pressure data
- Automated well integrity management activities scheduling
- Customisation of client specific well integrity management policies such as component failure models.
- Critical safety barriers assurance processes
- Seamless querying and visualisation of well integrity data
- Asset well integrity status summary dashboard





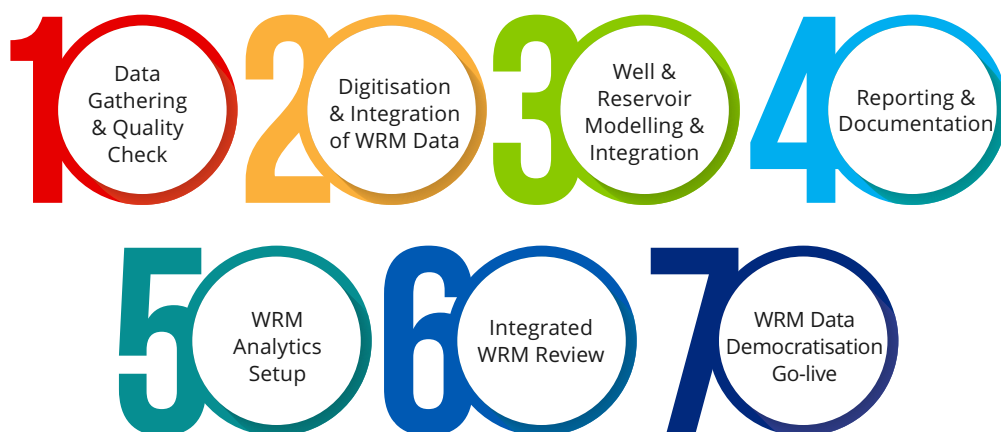
SECTION THREE:
**Our Asset
Management
Services**



E&P Service 1

WRM Data Democratisation Service

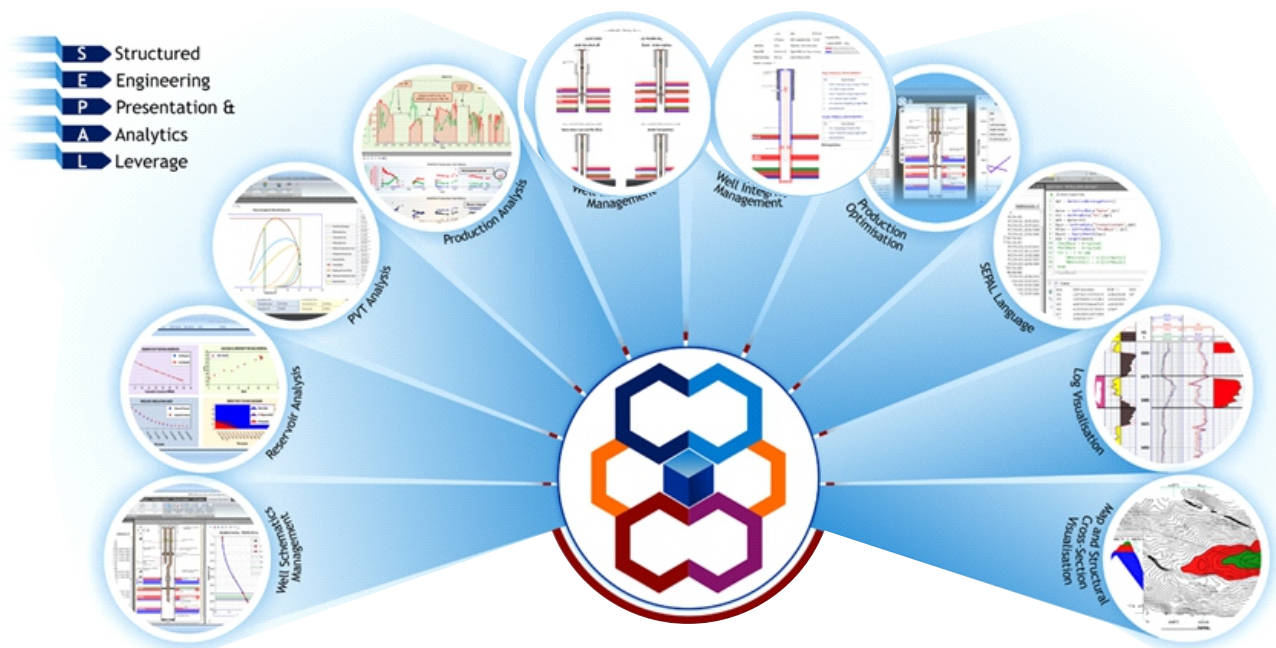
Our WRM data democratisation service tackles a fundamental asset management bottleneck which is the difficulty in accessing validated single-source-of-truth WRM data for day-to-day asset management and decision making. Leveraging our SEPAL WRM solution, thoroughly vetted multi-disciplinary asset data is digitised and integrated into a digital repository with embedded analysis, which can be accessed by all stakeholders from any location. This service thus provides a framework for improved operational efficiency, production enhancement, cost reduction and improved HSE.



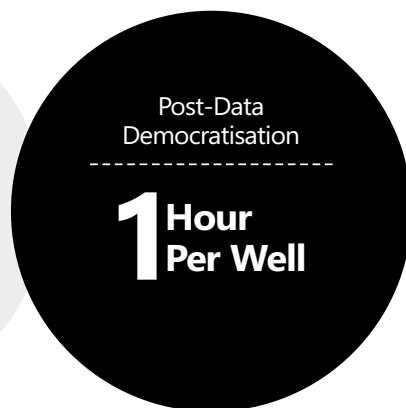
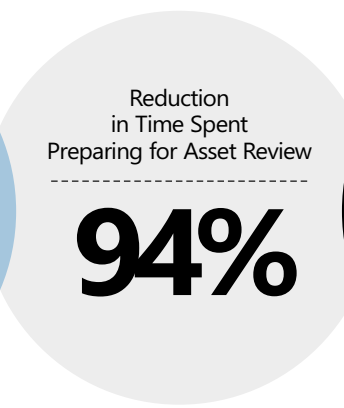
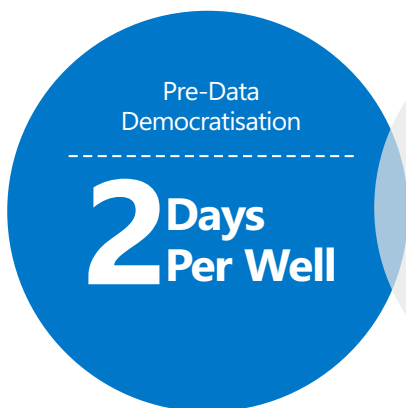
Data Democratisation Workflow

Value Proposition

- Access to critical WRM data and their evolutions from inception to the present day, providing a unique understanding of historical performance and operational conditions and constraints.
- High degree of confidence in the accuracy and validity of WRM data, occasioned by our robust data validation workflow.
- Seamless access to the digital repository from any location, leveraging of the democratisation of the database
- Robust quality control leveraging on read-and-write privileges provisioning, ensuring that only approved team members can modify the data in the database.
- Seamless opportunities identification and maturation, powered by critical WRM data visualisations and process automation.



Sample Output from the WRM Solution



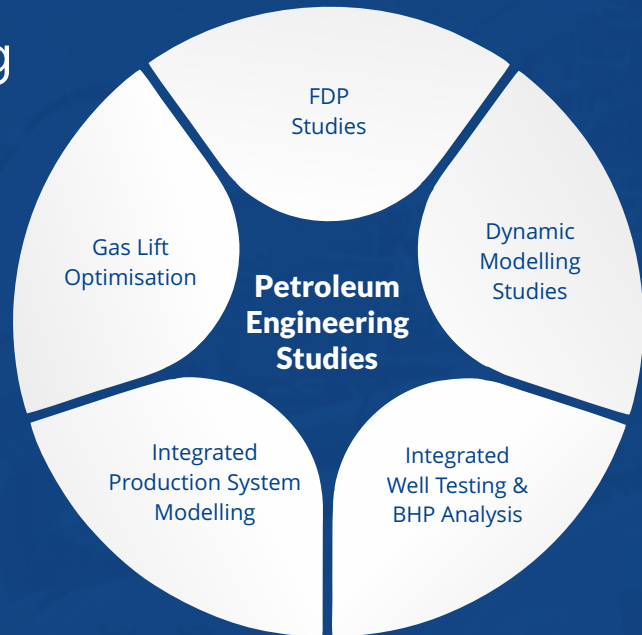
Testimonial:

“Following the embedment of SEPAL WRM's democratised digital database, our team now spends an average of 1 hour per well in preparing for Asset Reviews, a 94% time-savings on the previous 2 Days per well.”

E&P Service 2

Petroleum Engineering Studies Services

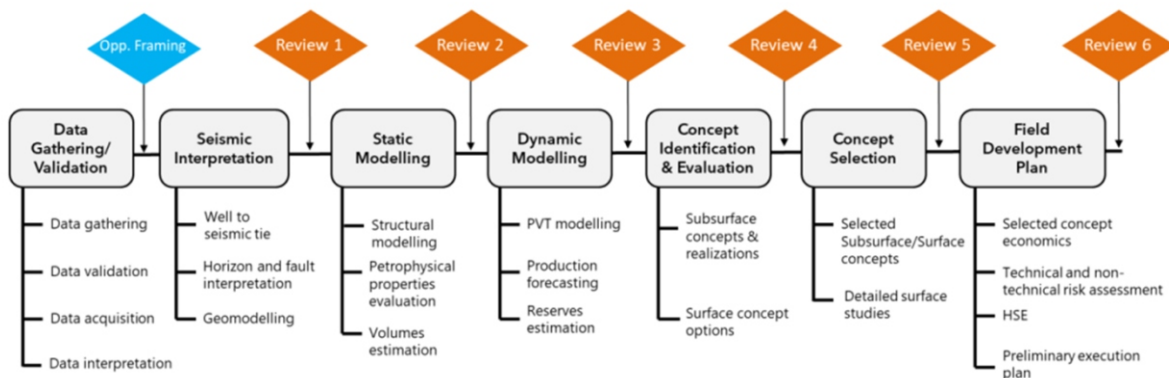
Our Petroleum Engineering Studies are delivered by experienced industry professionals, leveraging our proprietary asset management solutions, and backed by our strong research & development team. Other standard industry third-party solutions were applicable. Whether it's a standalone or integrated project, we are committed to supporting our clients in meeting their asset development goals by delivering a range of services which include:



Petroleum Engineering Studies

1. Field Development Plan (FDP) Studies

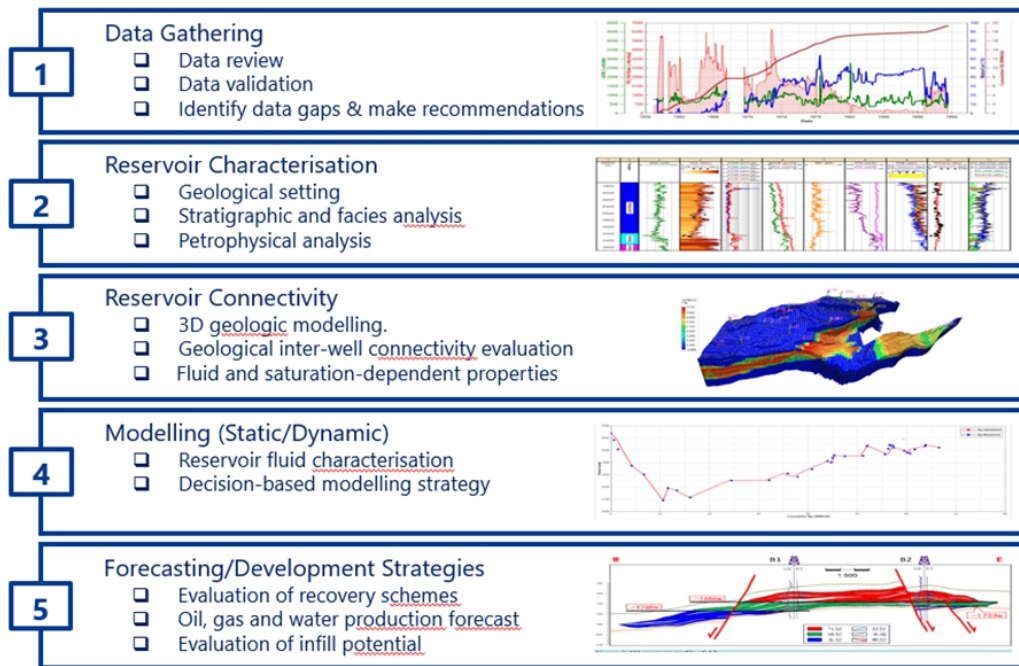
CypherCrescent has deep technical expertise, capability, and experience to assist clients with conceptual studies and field development planning. Our highly experienced integrated team made up of subsurface, surface, and petroleum economics disciplines support E&P firms in screening and selecting optimal integrated (reservoir, well, & surface facility) development concepts for green and mature assets that maximises return on investment. We also support our clients in presentations to partners and regulators for approval and implementation.



2. Reservoir Studies

To meet reservoir development/management goals, CypherCrescent supports E&P operators in delivering reservoir management studies aimed at:

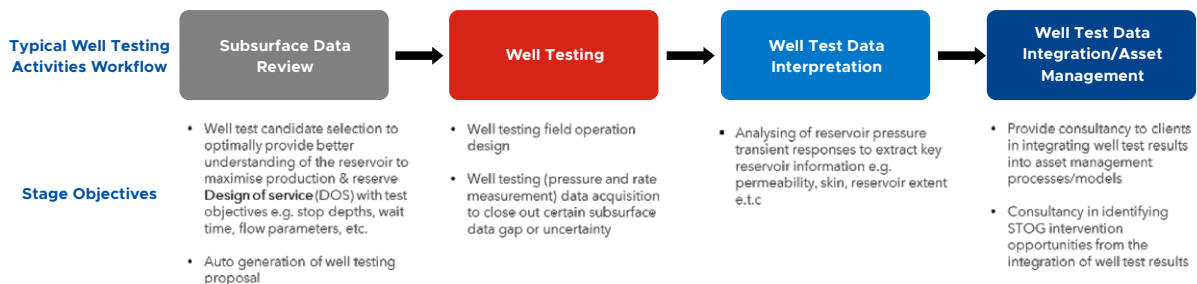
- Building/updating representative reservoir models (material balance models or 1D/3D dynamic models) that describes the reservoir structure, rock & fluid properties, and flow dynamics with high percentage of accuracy.
- Using the model and reservoir performance data to screen and define optimal reservoir development strategy that will maximise production, recovery, and reservoir energy under various operating conditions.



3. Integrated Well Testing & BHP Analysis

Our knowledge and understanding of advanced analytical procedures empowers us to design and interpret high level well testing activities that maximises value of information and profitability for our clients.

Our integrated well testing (BHP) service covers the following:



E&P Service 3

Asset Management Operations

In collaboration with our partners, CypherCrescent facilitates day-to-day full asset management operations for mining license owners to ensure integrated value maximisation and profitability for all stakeholders.



1

Asset Surveillance

- Daily production performance review
- Daily facilities review
- Daily review of asset integrity



2

Production Reconciliation & Reporting

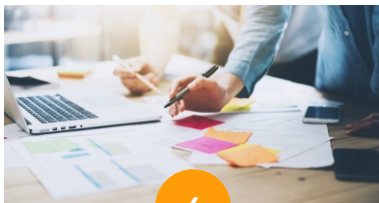
- Production back allocation
- Production reconciliation with regulators
- Production reporting



3

Asset Reviews

- Proactive asset review for quick remediation
- Opportunities identification and candidates selection
- Data acquisition campaign planning
- Well, reservoir, facility management (WRFM) planning
- Field development planning



4

Work Program Design

- Work programs for drilling and workover operations
- Work program for intervention activities
- Work program for data acquisition campaigns



5

Job Execution Supervision

- Supervision of drilling/workover operations
- Supervision of intervention operations
- Supervision of data acquisition jobs
- Cost and manhour performance tracking
- Short-term oil generation (STOG) campaign supervision



6

Business Planning Process

- Production forecasting for business planning
- Work programme definition for the business year
- Reserves booking
- Budget preparation
- Engagement with regulators and partners
- Community engagement

Value Proposition

- Effective asset management for increased productivity and profitability for all stakeholders, powered by seasoned industry subject matter experts.
- Provision of funding for the day-to-day management of the asset.
- Application of industry best practices to operate the asset at the lowest possible unit operating cost.

E&P Service 4

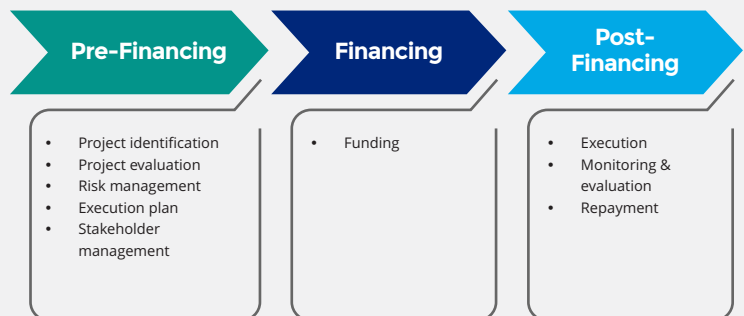
Project Financing



In collaboration with our partner (FABOK), CypherCrescent facilitates financing of some production enhancement projects for E&P operators to ensure upfront value maximisation from identified opportunities thereby minimising deferment due to fund unavailability.

Financing options can be either Debt Financing or Turnkey Production Sharing.

CypherCrescent-FABOK Project Financing Process



Value Proposition

- Robust technical and commercial evaluation of the viability of marginal assets.
- Third-party financing for marginal operators in need of funds for their asset's operation.
- Turnkey projects-production sharing.

Partner





SECTION FOUR:
**Our Projects and
Success Stories**



SEPAL WRM Software and Data Democratisation Service

Outcome

- Quality-checked legacy well and reservoir data to ensure reliability and validity.
- Digitisation and integration of validated WRM data into a digital database leveraging SEPAL WRM.
- Democratised the digital database to ensure accessibility from any location.
- Identification of production enhancement opportunities.

Summary Statistics



>3

Clients



>10

OMLs



500+

Democratised wells



250+

Software users

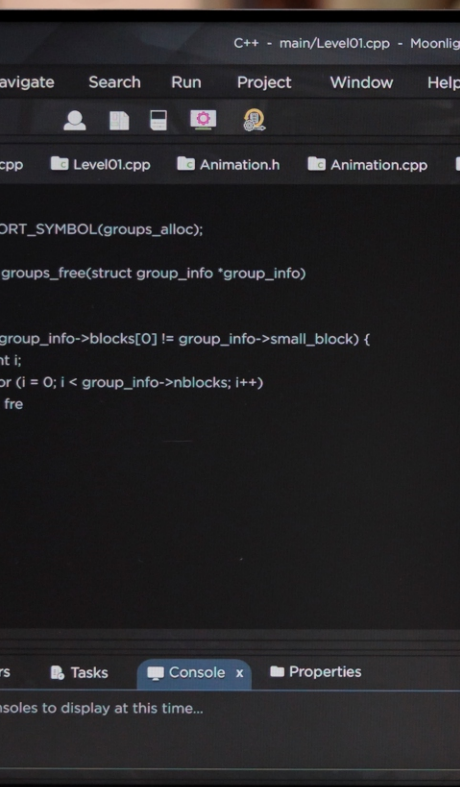


25k+

Estimated gains (Boepd)

Values Realised/Testimonials

Identified and matured a matrix stimulation opportunity which resulted in 411% increase in oil production leveraging SEPAL WRM (SPE-198875-MS).



SEPAL BFS Software

Outcome

- Generation of realistic production forecasts that accommodates unique business constraints like crude losses, surface capacity constraints, deferments, gas flares, etc.
- Seamless economic analysis and opportunities ranking with embedded PPTA and PIA fiscal regime algorithms.
- Entrench repeatability, auditability, and transparency in the forecasting and economic analysis process.

Summary Statistics



>3

Clients



300+

Drainage
Points



30+

Software
users

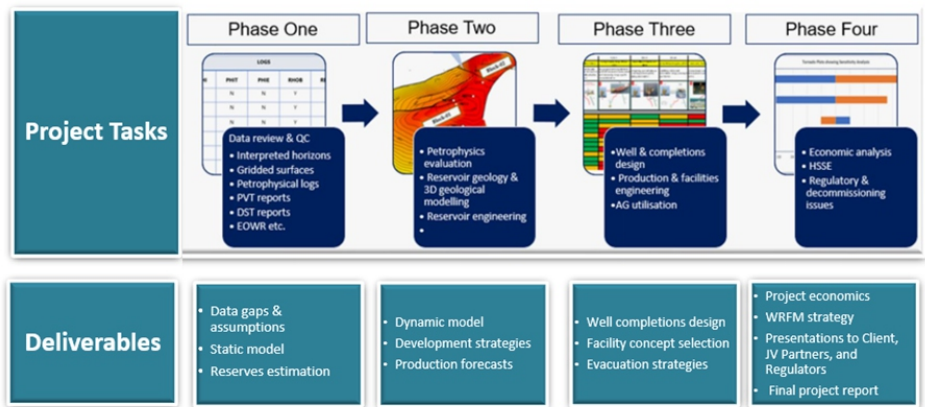
Values Realised/Testimonials

Improved business planning and hydrocarbon asset management leveraging SEPAL BFS (SPE 203736-MS)

Recent Petroleum Engineering Studies

FDP for a Green Asset (2022)

Project Title: Green Field FDP
Client: Indigenous E&P Operator
Year: 2022
Project Scope: Develop FDP for a green shallow offshore asset with 8 H/C bearing reservoirs

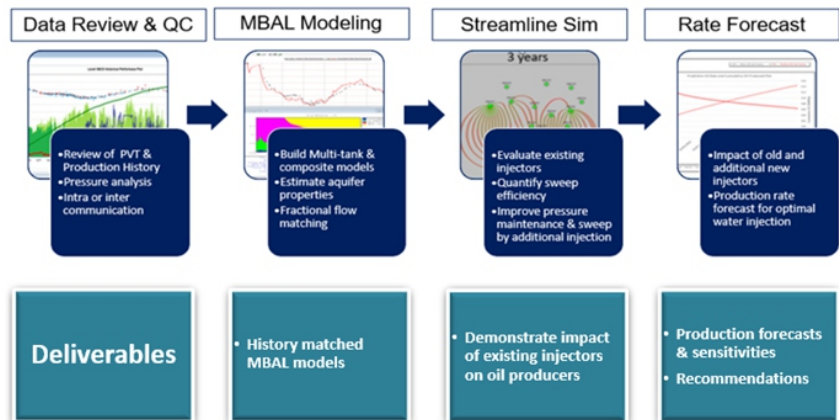


Water Injection Optimisation Study using Material Balance and Streamline Simulation (2021-2022)

Project Title: Water Injection Optimisation & MBAL Study
Client: IOC
Year: 2021 - 2022

Study Objective: Study on 2 sands to:

- Evaluate water injection performance on reservoirs, with focus on the impact of water injectors on oil producers
- Identify closed oil wells in good locations to be converted to water injectors or closed water injector wells to be reactivated
- Evaluate the gains associated to increased water injection (of selected wells into the reservoirs)

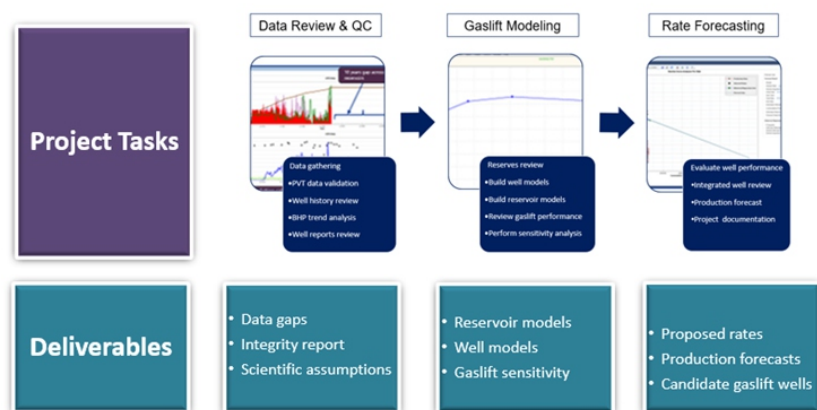


Field Rejuvenation and Gaslift Optimisation Study (2021)

Project Title: Mature Field Rejuvenation and Gaslift Optimisation Study
Client: Indigenous E&P Operator
Year: 2021

Study Objective: Study on a field that hasn't produced for over 10 years to:

- Maximise recovery from the field upon re-entry
- Identify candidate wells for gas-lifting whilst honoring constraint of available gas





Our Technical Assurance Team

Our asset management services/deliverables are assured by experienced industry professionals with over 300-man years' experience drawn from diverse backgrounds and backed by our strong research & development team.



Fidelis Tendo

Fidelis has over 30 years E & P experience working for Shell in several countries. His areas of expertise include reservoir modelling, resource volume estimation, IPSM and PSO.



ThankGod Egbe

Thankgod has over 15 years E & P experience working for Shell in several countries. His area of expertise includes Software development, IPSM and reservoir modeling.



Prof. David Ogbe

Prof. David has over 38 years experience in E & P consulting, teaching and technical research. His areas of expertise include formation evaluation, reservoir modelling and well test analysis.



Joseph Kintum

Joseph has over 15 years E & P experience working for Shell, Seplat, Newcross and Sahara Energy as a well engineer.



Burney Waring

Burney has about 35 years E & P experience working for Shell in several countries. He is a global expert in practical production system optimisation.

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