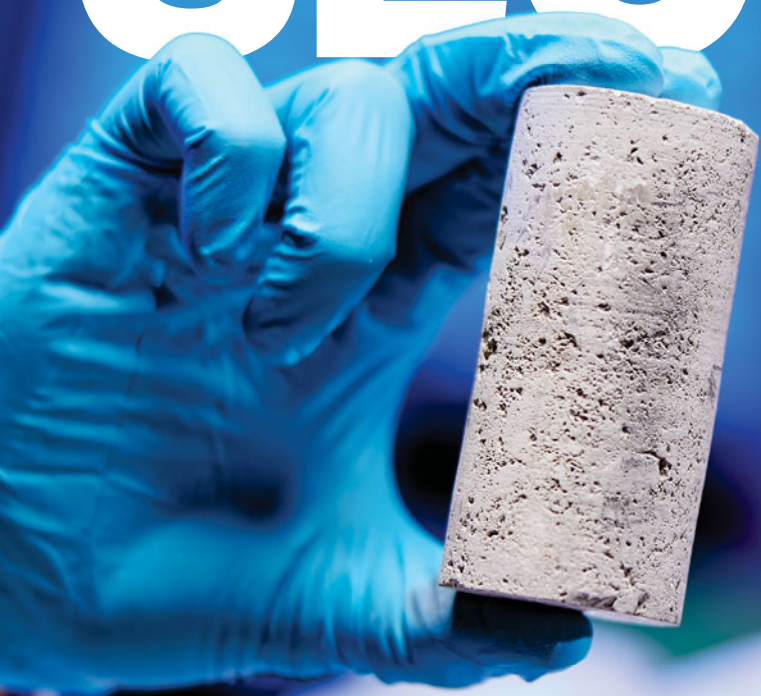


Transforming, decarbonizing and future proofing



THE ENERGY SECTOR



**ADNOC Research
and Innovation Center**
Service Catalog



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Welcome to ADRIC

The ADNOC Research and Innovation Center (ADRIC) advances technologies to improve efficiency, safety, and sustainability in the energy sector.

Key Objectives

- Accelerate energy transition with digital, decarbonization, and robotic technologies
- Develop innovations from proof-of-concept to pilot demonstrations and early deployment
- Create opportunities for UAE's pioneers by providing students and partners with access to state-of-the-art facilities

Facilities

- 26,000 square meters of advanced laboratories
- 8,000 m² Laboratory area
- 1000+ pieces of cutting-edge equipment
- 250+ people capacity
- 6 distinct capability clusters, and a future expansion program



What we offer

ADRIC provides comprehensive support to businesses through:

1

Strategic Initiatives

- Collaborate with academia and UAE government
- Scout opportunities for In-country value (ICV) generation & international growth

2

Technical Research Programs

- Scope and execute programs across fundamental disciplines
- Align with strategic initiatives of the UAE energy sector

3

Consultancy Services

- Leverage a network of local and global domain experts from ADNOC and partners
- Provide expert consultancy and collaboration

4

Technical Support

- Business exploration
- Technical challenge mitigation
- New horizon growth



Building area

26,000m²



Laboratory area

8,000m²



People capacity

250+



Laboratory equipment

1,100+

ADRIC innovation platform



Infrastructure

Access to two innovation clusters:

- Subsurface intelligence
- Nexgen solutions

Access to four service platforms:

- Materials blueprinting
- 360 visualization
- Quality assurance
- Central facilities

Collaboration opportunities in
ADRIC Future Expansion Program



People

Access to technical expertise:

- ADNOC Subject Matter Experts (SMEs)
- ADNOC network of technology-partners
- Local and international academia partners



Logistics

Supported by the ADNOC innovation ecosystem:

- Dynamic partnerships model
- Dynamic operating model
- Competitive Intellectual Property and Commercialization provisions



Data

Access to relevant data:

- Experimental data generated from ADRIC labs
- Simulation data
- Data from relevant ADNOC business functions based on alignment with said functions, including:
 - ADNOC Upstream
 - ADNOC Downstream

Our innovation programs

With its two dynamic innovation clusters, ADRIC is dedicated to cementing its status as a global leader in subsurface intelligence, while simultaneously pushing the boundaries of knowledge and creativity in the pursuit of ground-breaking solutions for the energy sector.

Innovation Cluster	Description	Core Capabilities
Subsurface intelligence	Combining the understanding of reservoir rocks and fluids with high-performance computing and digital solutions for accurate field development and optimized production.	• Reservoir core and fluid analysis • Dynamic in-situ saturation monitoring • Well stimulation • Integrated petrophysics • Solid deposition measurements and inhibitor evaluation • Water quality measurements
Nexgen solutions	The energy sector is undergoing a transformative shift with next-generation solutions and smart materials driven by sustainability. Such developments will accelerate the energy transition, stimulate economic growth and local manufacturing opportunities.	• Electolysers testing • Catalytic reactors • Separation rigs • Battery-testing systems • Pilot plants



R&D Focus Areas

- Enhanced oil recovery (EOR)
 - Unconventional field development
 - Sour field development
 - Acidization and Stimulation
 - Flow Assurance
 - Production optimization
 - Corrosion management
 - Water Management
 - Digital Solutions
 - AI-based Solutions
-
- Sustainable energy production
 - Carbon Capture, Utilization and Storage (CCUS)
 - Decarbonization, decarbonized heat & industrial processes
 - Electrification & energy storage
 - Catalysis and separation
 - Biofuels and Sustainable Fuels
 - Nature-based Solutions
 - Non-metallics
 - Engineered materials

Our service platforms

Serving the innovation clusters are four service platforms which offer infrastructure support, subject matter expertise and technical input to different stakeholders with the mandate to accelerate and enable project delivery.



Service Platform	Description	Core Capabilities
Materials blueprinting	Revolutionizing the energy sector's materials landscape with innovative materials design, qualification and assessment in different environments and applications.	• Crystallography • Spectroscopy • Textural characterization • Rheology and interfaces • Environmental aging & corrosion
360 visualization	The synergy between 2D precision and 3D innovation enables researchers to unlock opportunities across the energy value chain.	• Electron microscopy • CT scanning • Gamma ray scanning • Linear x-ray scanning
Quality assurance	A wide variety of materials and engineering solutions are screened and qualified in this iso-certified cluster for field deployment, while feedback data reg challenges encountered on-field are directly sent to this cluster for real-time resolution.	• Cement materials testing • Production chemistry • Production chemicals testing
Central facilities	The central hub which provides infrastructural support and services across all other lab clusters to enable their uninterrupted operation at optimal efficiency.	• Machinshop & 3D Printing • Digitalization & AI • Central store





Future Expansion Program

ADRIC empowers innovation by fostering collaboration via hosting technology partnerships in its Future Expansion Program (FEP). The purpose of this program is to address future R&D requirements and deliver tomorrow's solutions aligned with ADNOC's vision, mission, and strategic objectives. We achieve this via partnership, and the incubation of promising startups.



Net-zero by

2045

Cultivating an innovative ecosystem

This space is the fertile ground where ideas germinate, innovations find roots, and solutions take shape. It reflects ADRIC's commitment to pioneering advancements in the energy sector.

Sustainability in focus

Through its FEP, ADRIC plans to engage in strategic activities, including the sustainable powering of operations, the testing of cutting-edge non-metallic materials, and the pursuit of decarbonization and the hydrogen economy, aligning with ADNOC's energy transition initiatives.

Esteemed partnerships and promising incubees

ADRIC's esteemed partnerships and promising incubees form the collaborative network and beating heart of this cluster. These partnerships extend beyond traditional boundaries, creating an environment where industry leaders join to address challenges and unlock possibilities.

ADRIC's Future Expansion Program embodies a commitment to innovation, sustainability, and the persistent pursuit of solutions that will power a brighter and more resilient tomorrow.



Innovation Cluster 1: Subsurface Intelligence

ADRIC offers advanced capabilities for comprehensive, reliable insights into hydrocarbon reservoirs. Using special and conventional analyses, ADRIC integrates data from onshore and offshore fields to create a holistic petrophysical picture, optimizing well design and operations.



Reservoir Core Analysis

- Routine Core Analysis: we conduct high-throughput sampling, CT scanning, plug cleaning, petrography, gas porosity, and permeability measurements. These data libraries can support deep-learning models for unprecedented subsurface insights.
- Special Core Analysis: we investigate multiphase flow behavior, capillary pressure, relative permeability, wettability, NMR core analysis, and more. These provide insights which inform enhanced oil recovery and carbon sequestration strategies.

Acidizing and Stimulation

We use sophisticated methods to investigate acidizing treatments, fluid conduct flow simulations, and formation damage characterization.

Integrated Petrophysics

We combine routine and special core analysis with advanced capabilities like CT scanning and in-situ saturation monitoring for a comprehensive petrophysical picture.

Subsurface Digitalization and AI

We utilize data scraping, pipelines, deep learning models, and advanced computational technologies to form a holistic petrophysical picture of reservoir assets.



Stable Isotope Analysis

We offer a range of cutting-edge capabilities to analyze geological and environmental samples, providing essential insights for sustainable resource management.

Sedimentology

We investigate modern and ancient sediments, sedimentary rocks, and microfossils to understand geological processes.

Geochemistry

We investigate geological and environmental samples to form a holistic carbon map and understand subsurface dynamics.

Reservoir Fluid Analysis

We gather extensive data on fluid behavior, phase behavior, flow assurance, and chemical stability to optimize production.

Reservoir Fluid Properties

We conduct PVT investigations, simulating reservoir conditions and measuring crucial reservoir parameters.

Reservoir Fluid Compositional Analysis

We provide holistic compositional data and analytics for sour and sweet reservoir fluids.

Reservoir Fluid Thermophysical Properties

We manipulate and measure fluid behaviors under controlled conditions for various applications.

Rheology and Interfacial Science

We automate formulation and characterization of polymer and surfactant dispersions for surface wettability alteration.

Physicochemical Characterization

We develop complete profiles of physical and chemical properties, composition, quality, purity, and stability.

Flow Assurance

We investigate solid deposition phenomena, evaluate scale and asphaltene inhibitors, and provide flow assurance solutions.

Water Management

We test and screen wastewater treatment technologies, optimizing resource recovery, and supporting sustainable energy production.



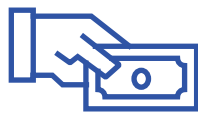
100+

Services



10+

Projects



\$20MM+

Value

Innovation Cluster 2: NexGen Solutions

The NexGen lab cluster focuses on materials science, engineering, and energy solutions across the supply chain. This includes sustainable production, transport, and storage solutions for carbon capture, hydrogen production, water treatment, and recycling.



Electrification and Energy Storage Systems

We investigate cutting-edge technologies for batteries and fuel cells, develop energy management systems, and evaluate emerging electrification solutions.

Sustainable and Renewable Energy Production

We drive progress in clean energy technologies, including hydrogen production from advanced low-carbon methods.

Novel Energy Storage Materials

We develop and investigate sustainable energy storage media like low-carbon ammonia, hydrogen carriers, porous carbons, and ceramics.

Carbon Capture, Utilization, and Storage (CCUS)

We innovate solutions for capturing and storing carbon emissions, contributing to sustainable and environmentally conscious practices.

Gas Processing

We investigate candidate materials for gas processing applications and screening promising candidates for sustainable energy development.

Absorbents and Extraction

We support the screening and testing of liquid-based extraction technologies for efficient and sustainable resource utilization.

Adsorbents and Membrane Separation

We examine permeation performance for selected membranes and polymer composites to optimize separation processes.

Non-Metallics & Composite Materials

We specialize in mechanical performance and failure-testing of non-metallic materials, primarily for pipe applications, to reduce environmental impact.

Value-Driven Demand Creation

We incubate novel materials like graphene to drive innovation, production optimization, and demand creation for high-value materials across various industries.

“Sustainability is a vital element of the UAE's vision for the future. We are committed to supporting and investing in renewable energy projects, both locally and globally, to ensure a sustainable and prosperous future for all.”

● **H.H. Sheikh Mohamed bin Zayed AL Nahyan**
President of the United Arab Emirates



Service Platform 1: Materials Blueprinting

ADRIC offers a range of characterization and testing capabilities, supporting the development and qualification of engineered solutions in CCUS, hydrogen, water treatment, and more.





150+

Services

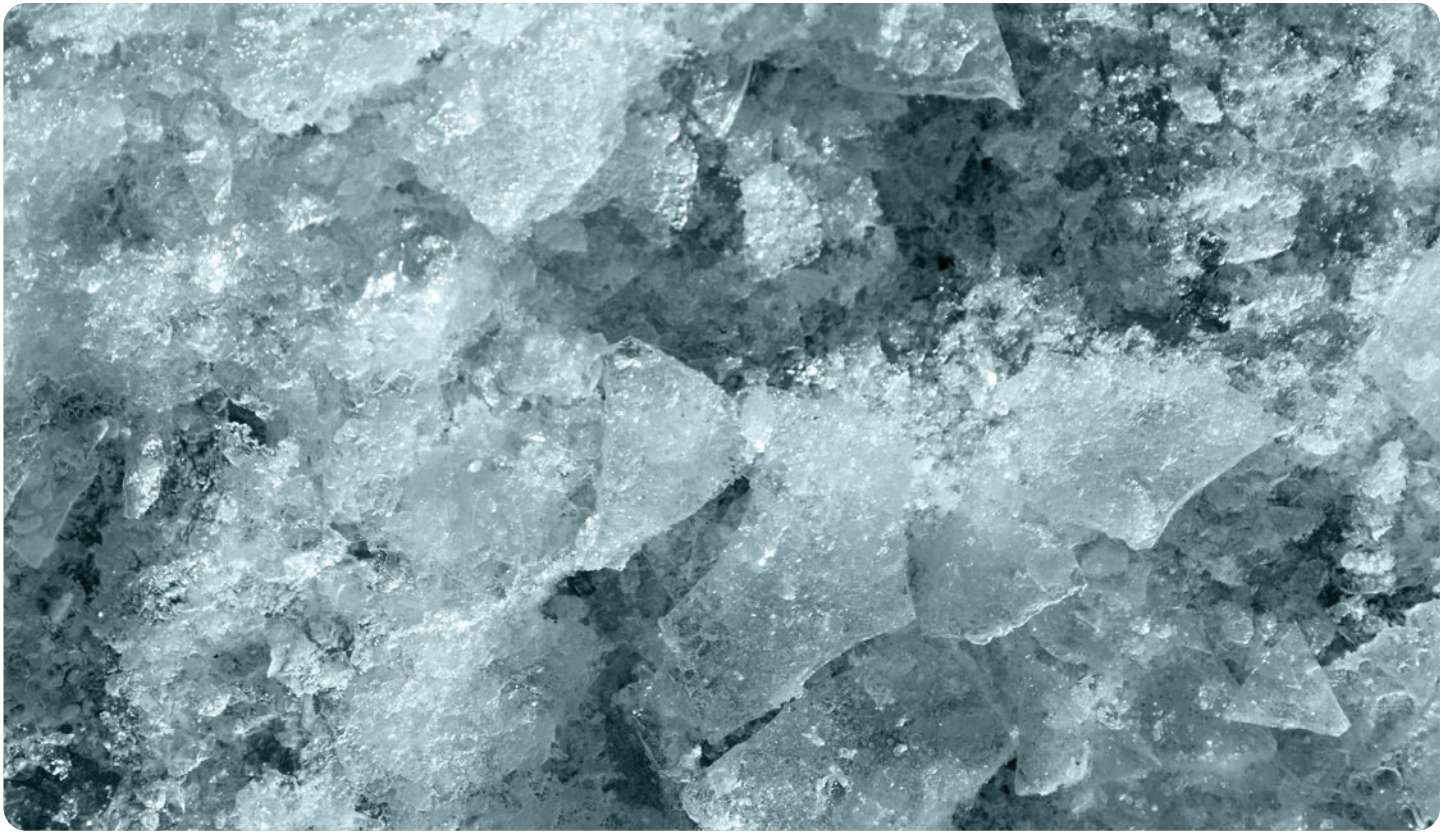


10+

Projects



\$2 M



Materials Structural, Textural, and Compositional Analysis

We map elemental distribution, investigating v, measuring surface area and pore size distribution, and determining thermal stability.

Polymers and Composites

We explore and advance polymer science for applications like reinforced thermoplastic pipes and composites, addressing industrial challenges.

Electrochemistry and Corrosion

We investigate corrosion behavior in metallic materials and develop effective protection, mitigation, and integrity management solutions.

“Materials are fundamental to everything we use and consume on a daily basis.”

Service Platform 2: 360 Visualization

This cluster offers cutting-edge imaging technologies for holistic visualization of materials and biological samples, fostering innovation in various fields.





3D Imaging

We conduct high-resolution solid materials visualization and real-time flow monitoring for applications like digital micro-modeling and solid-fluid interaction studies.

2D Imaging

We use linear x-ray and gamma-ray scanning capabilities for detailed in-situ flow visualization and real-time fluid monitoring.

Microscopy

We explore materials and specimens at the nanoscale, providing unparalleled insights into their structural and chemical characteristics.

Service Platform 3: Quality Assurance

This ISO-certified cluster of labs ensures the quality of field performance for deployed materials, addressing challenges like corrosion, fluid, and cement quality.







Drilling Fluids

We conduct tests on drilling fluids and mud to ensure they meet company specifications.

Cementing Fluids

We test cement slurries for parameters like density, rheology, and compressive strength to assess their suitability.

Stimulation Fluids

We evaluate acid formulations to optimize content and ensure compatibility with tubulars, reservoir fluids, and rocks.

Production Chemistry

We analyze crude oils, water chemistry, and compositions of scales, deposits, and sludge.

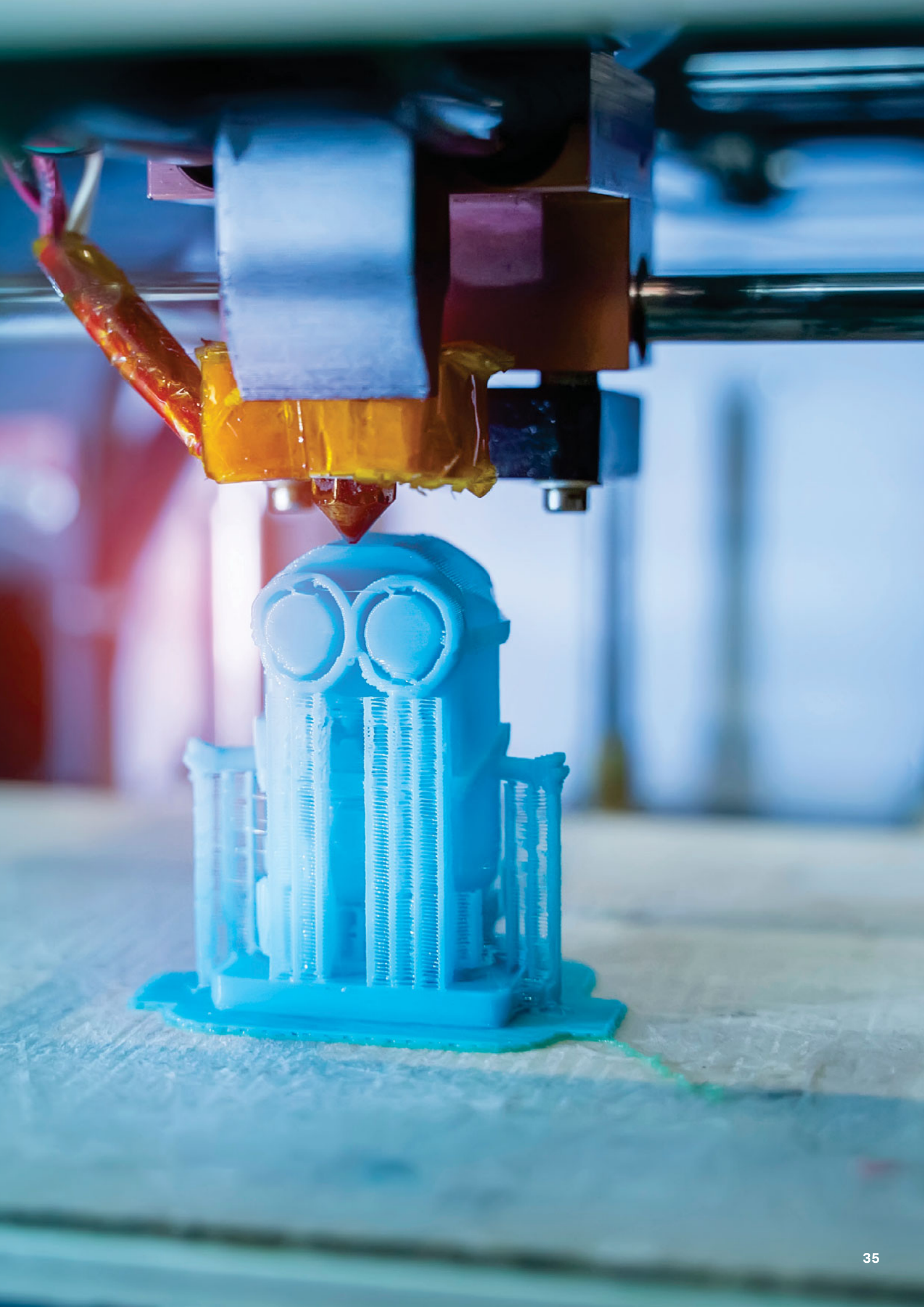
Production Chemicals

We conduct QA/QC testing on production chemicals and physical characteristics.



Service Platform 4: Central Facilities

The Central Facilities cluster supports all ADRIC labs, providing resources for digital solutions, precision crafting, and collaborative workspaces.





1100+

Assets



10+

Collaborative area/workspace

Digital Solutions

We study and test digital transformation services and products, including data analytics and machine learning applications.

Collaborative Workspaces

We offer hubs of collaboration where diverse minds converge to explore innovative applications of technology for the energy sector.

Central Workshop

We offer a hands-on innovation space for rapid prototyping, machining, fabrication, welding, and equipment maintenance.



Capabilities

INNOVATION CLUSTER 1: SUBSURFACE INTELLIGENCE

RESERVOIR CORE

RC/LS1	Core cutting and trimming
RC/LS2	Flow-through cleaning of plug samples
RC/LS3	Soxhlet cleaning of plug samples
RC/LS4	Computed Tomography (CT) scanning of plug samples
RC/LS5	Conventional CT scanning of preserved samples
RC/LS6	Conventional CT scanning of whole core samples
RC/LS7	Micro-CT scanning of plug samples
RC/LS8	Helium porosity, grain density (GD) and bulk volume (BV) of plug samples
RC/LS9	Helium porosity measurement of plug samples
RC/LS10	Gas permeability measurement of plug samples
RC/LS11	Saturation of plug samples
RC/LS12	Saturation of whole core samples
RC/LS13	Core nuclear magnetic resonance (NMR)
RC/LS14	Acoustic testing of plug samples under dry conditions
RC/LS15	Acoustic testing of plug samples under saturated conditions
RC/LS16	Planetary ball milling
RC/LS17	SWI measurement using core holder & porous disc at ambient conditions
RC/LS18	Cementation factor at reservoir conditions
RC/LS19	Drainage and imbibition at reservoir conditions using porous disc
RC/LS20	Drainage and imbibition water/oil capillary pressure using porous disc
RC/LS21	Absolute brine permeability and absolute oil permeability measurements
RC/LS22	Multi-speed centrifugation (drainage and imbibition)
RC/LS23	Core aging - four weeks
RC/LS24	Spontaneous imbibition at ambient conditions using Amott cell
RC/LS25	Homogenization of crude oil using bench top centrifuge
RC/LS26	Determination of moisture content in liquid samples using titrator
RC/LS27	Dean-Stark distillation for oil/water extraction from plug samples
RC/LS28	Zeta potential of core sample
RC/LS29	Crude oil density measurement at ambient condition
RC/LS30	Crude oil viscosity measurement at ambient condition
RC/LS31	Conventional core flooding (water/oil) for relative permeability at unsteady state
RC/LS32	Conventional core flooding (water/oil) for relative permeability at steady state
RC/LS33	Conventional core flooding (water/oil/CO ₂) for relative permeability at unsteady state
RC/LS34	Conventional core flooding (water/oil/polymer/surfactant) for relative permeability
RC/LS35	Conventional core flooding (water/polymer) to measure injectivity

RC/LS36	Acidizing core floods at high pressure and high temperature (HPHT)
RC/LS37	Linear x-ray scanning (LXRS)-core flooding (water/oil), unsteady state relative perm
RC/LS38	LXRS and core flooding (water/oil) for steady state relative permeability
RC/LS39	LXRS and core flooding (water/oil/polymer) for relative permeability
RC/LS40	LXRS and core flooding (water/polymer) for injectivity studies
RC/LS41	CT core flooding (water/oil) for relative permeability at unsteady state
RC/LS42	CT core flooding (water/oil) for relative permeability at steady state
RC/LS43	CT core flooding (water/oil/polymer) for injectivity studies
RC/LS44	CT core flooding (water/oil/CO ₂) for relative permeability at steady state
RC/LS45	CT core flooding (water/oil/CO ₂) for relative permeability at unsteady state
RC/LS46	CT core flooding (water/polymer flooding) for injectivity studies
RC/LS47	IFT measurement (water/oil) from 20 to 60°C by spinning drop tensiometer
RC/LS48	IFT measurement (water/oil) from 20 to 60°C by rising bubble
RC/LS49	IFT measurement (water/oil) from 20 to 60°C by pendant drop
RC/LS50	IFT measurement (water/oil/gas) from 20 to 150°C by spinning drop tensiometer
RC/LS51	IFT measurement (water/oil/gas) from 20 to 150°C by rising bubble
RC/LS52	IFT measurement (water/oil) for 20 to 150°C by pendant drop
RC/LS53	Stable isotope analysis of rock/outcrop by isotope ratio mass spectrometry (IRMS)
RC/LS54	Source rock characterization for total organic carbon (TOC) content
RC/LS55	Organic composition of soil, sediment, and rock by gas chromatograph (GC)
RC/LS56	Organic component identification in soil, sediment and rock samples via GC-MS
RC/LS57	Elemental analysis by handheld X-ray fluorescence (XRF) spectroscopy
RC/LS58	Microwave digestion of whole rock and sediment samples for chemical analyses
RC/LS59	Automatic solvent extraction of organic matter from sediment & powdered rock
RC/LS60	Annealing of rock samples
RC/LS61	Thin section petrography
RC/LS62	Image analysis (PerGeos software)
RC/LS63	Image analysis (Avizo software)
RC/LS64	Core Polishing
RC/LS65	Acidizing core flooding experiment at 120-135 °C using <20% HCl acid
RC/LS66	Core plugging
RC/LS67	Whole core slab cutting
RC/LS68	Single-speed centrifugation of plug sample
RC/LS69	Primary drainage & imbibition test by multi-speed centrifugation
RC/LS70	Core flood for asphaltene precipitation at reservoir condition

RC/LS71	Core flood with CT scan for asphaltene precipitation at reservoir condition
RC/LS72	Core flood for asphaltene precipitation at reservoir condition by live oil
RC/LS73	Core flood with CT scan for asphaltene precipitation, reservoir condition, live oil
RC/LS74	Core layout marking and orientation, checking versus inventory list
RC/LS75	Core reboxing and repacking including boxes
RC/LS76	Core slabbing
RC/LS77	Handling of trim ends - bag, label (Full Diameter)
RC/LS78	Convection Drying
RC/LS79	Residual fluid extraction and hydrocarbon volume quantification in mud sample
RC/LS80	Residual fluids saturation and porosity by summation of fluids - Dean-Stark method
RC/LS81	Drilling & trimming core samples, labeling with brief lithologic description
RC/LS82	Core Surface Cleaning
RC/LS83	Single speed end point Desaturation by Centrifuge to Swi
RC/LS84	Computed Tomography (CT) image processing of plug samples
RC/LS85	Tight Rock - He porosity, grain density (GD) and bulk volume (BV) of plug
RC/LS86	Tight Rock - Gas permeability (Kg) measurement of plug samples
RC/LS87	Tight Rock - Saturation of plug samples
RC/LS88	Tight Rock - sample preparation & routine core analysis (porosity, perm, GD, BV, sat)
RC/LS89	Computed Tomography (CT) image processing of whole core (1 ft)
RC/LS90	Absolute brine (Kw) permeability measurements
RC/LS91	Conventional CT Image for Worm hole processing plug samples upto 6"
RC/LS92	Conventional CT Image for Worm hole processing 1ft core plug
RC/LS93	FRF, m and Kw and porosity, 4 pressure steps from ambient to overburden P
RC/LS94	Brine preparation
RC/LS95	Soxhlet cleaning (Toluene /Methanol) for horizontal & vertical plugs
RC/LS96	Combined analyses, porosity, GD, USS/SS Klinkenberg, perm (ambient, OB), lithology
RC/LS97	Single energy Helical CT scanning and high resolution CT number
RC/LS98	Saturate with synthetic brine and measure Kw at ambient and OB conditions
RC/LS99	Flow-through cleaning of plug samples
RC/LS100	Residual fluids saturations & porosity by summation of fluids (Dean-Stark)
RC/LS101	Residual fluids extraction by special Dean Stark, plug sample
RC/LS102	Residual fluids extraction - mud sample
RC/LS103	Traced analysis of extracted fluids Potassium Iodide
RC/LS104	Compositional analysis of brine to assess formation damage, API12 ION
RC/LS105	Drilling & trimming plugs, bagging & labeling with brief lithologic description
RC/LS106	X-Ray Diffraction Analysis - whole rock & clay (<2µm)
RC/LS107	Spectral Core gamma log & Total Core Gamma Ray
RC/LS108	Digital White light and Ultra Violet Photography
RC/LS109	Digital Imaging Services White Light & Ultra Violet per frame
RC/LS110	High P (drainage up to 60000 psi) Mercury injection & pore throat size distribution

RC/LS111	CT core flooding (water/oil/gas) for relative permeability at unsteady state (USS)
RC/LS112	Dual energy Helical CT scanning and high resolution CT number
RC/LS113	CT scanning for plug samples dual energy
RC/LS114	Conventional core flooding with multi-tap brine/polymer injectivity
RC/LS115	X-Ray Diffraction Analysis - whole rock
RC/LS116	Core view room rental
RC/LS117	Total core gamma log
RC/LS118	Spectral Core gamma log
RC/LS119	Core matrix (bulk) density log
RC/LS120	Core photography for whole cores- 360 degree White light & Ultra Violet
RC/LS121	CT scanning of full diameter core, single energy - 1 x scout and 4 x axial
RC/LS122	Combined analyses, porosity, GD, permeability, brief lithology description
RC/LS123	Combined analyses, porosity, GD, permeability (ambient, overburden), brief lithology
RC/LS124	Combined analyses, porosity, GD, permeability at additional OB, brief lithology
RC/LS125	Combined analyses, porosity, GD, USS/SS Klinkenberg, air perm (ambient, OB), lithology
RC/LS126	USS or SS Klinkenberg and air permeability at ambient & OB pressure, brief lithology
RC/LS127	Combined analyses, porosity, Klinkenberg & nitrogen perm, GD unsteady state
RC/LS128	Combined analyses, porosity, Klinkenberg/N ₂ perm, GD, unsteady state, elevated NCS
RC/LS129	T2 Measurements @ 100% Sw, each Te
RC/LS130	T1 Measurements @ 100% Sw
RC/LS131	Drilling and trimming 1.5" preserved samples
RC/LS132	Trimming samples with specific brine or oil
RC/LS133	Drilling over-size full diameter samples
RC/LS134	Handling of trim ends - bag, label
RC/LS135	Sample cleaning with standard solvents - soxhlet
RC/LS136	Whole core Kv/Kh measurement
RC/LS137	Core combined analyses, porosity, perm, GD, ambient conditions, brief lithology
RC/LS138	Core combined analyses, porosity, perm, GD, OB pressure, brief lithology
RC/LS139	Core combined analyses, porosity, perm, additional P step
RC/LS140	Formation Factor (a and m): plug (ambient P & T)
RC/LS141	Formation Factor (a and m): plug (ambient & OB pressure at ambient T)
RC/LS142	Formation Factor (a and m): plug (additional P step)
RC/LS143	Complete test incl FRF, m and Kw and porosity, 4 steps from ambient to OB pressure
RC/LS144	Establish Swi for plug - Porous Plate - OB, water sat profile & monitoring (e.g.: x-ray)
RC/LS145	End point Desaturation by Centrifuge to Swi
RC/LS146	Dead oil aging, reservoir T, OB pressure, effective perm before/after aging,
RC/LS147	Saturate samples with synthetic brine 100% and measure Kw at ambient & OB
RC/LS148	Formation Factor (a and m): (Ambient P and T) one pressure step
RC/LS149	Formation Factor (a and m): (Ambient & OB pressure at ambient T)
RC/LS150	Formation Factor (a and m): additional pressure step

RC/LS151	Formation Factor (FRF), m and Kw and porosity, 4 pressure steps (ambient to OB)
RC/LS152	Establish Swi - Porous Plate - plug - OB, water sat profile & monitoring (e.g.: x-ray)
RC/LS153	Live oil aging, at full reservoir conditions, effective perm before & after aging
RC/LS154	Dead oil aging (reservoir T, OB pressure), effective perm before & after aging
RC/LS155	High Speed Centrifuge with automated data acquisition at elevated T
RC/LS156	High Speed Centrifuge with automated data acquisition - drainage cycle - elevated T
RC/LS157	High Speed Centrifuge, drainage & imbibition, comparison by wt and vol
RC/LS158	Amott test
RC/LS159	High speed centrifugation & automated data acquisition - 8 speeds - drainage, imbibition
RC/LS160	High speed centrifugation & automated data acquisition - additional speeds
RC/LS161	Wettability test - High speed centrifuge & automated data acquisition - 8 speeds
RC/LS162	Drainage cycle only (8 points)
RC/LS163	Concurrent measurement of resistivity Index 'n' (drainage)
RC/LS164	Imbibition cycle only (8 points)
RC/LS165	Concurrent measurement of resistivity Index 'n' (imbibition)
RC/LS166	Primary drainage and imbibition PcRI cycles including resistivity index
RC/LS167	High Speed Centrifuge & automated data acquisition, ambient T (Swrg and Kg at Swr)
RC/LS168	High Speed Centrifuge & automated data acquisition (Swrg and Kg at Swr)
RC/LS169	Drainage cycle only (8 points) ambient
RC/LS170	Drainage cycle each additional point
RC/LS171	Concurrent measurement of resistivity Index 'n'
RC/LS172	SS Primary drainage of live crude oil & brine relative perm at reservoir conditions
RC/LS173	SS Primary drainage dead oil - brine relative perm at reservoir condition
RC/LS174	Two bump rates to reach Swro
RC/LS175	SS imbibition live brine - oil relative permeability at reservoir conditions
RC/LS176	2 bump rates to reach Sorw (Steady State, Imbibition Oil-Water Relative Permeability)
RC/LS177	Final saturation confirmation (Steady State, Imbibition Oil-Water Relative Permeability)
RC/LS178	Measure Kw, end of Kr test, reservoir condition (SS, Imbibition Oil-Water Rel Perm)
RC/LS179	SS gas - live oil relative permeability measurement at reservoir conditions
RC/LS180	Two bump rates to reach Sorg (Steady State (SS): Gas-Oil Relative Permeability)
RC/LS181	SS gas - crude oil relative perm, reservoir conditions
RC/LS182	Two bump rates to reach Sorg (Steady State (SS): Gas-Oil Relative Permeability)
RC/LS183	Gas-Water Relative Permeability (endpoint) imbibition, ambient
RC/LS184	Gas-Water Relative Permeability (endpoint) imbibition, elevated T, P
RC/LS185	Multi-rate USS drainage crude-brine relative perm, elevated T, P - ISSM, mass balance
RC/LS186	Multi-rate USS drainage live oil-brine relative perm, elevated P, T - ISSM, mass balance
RC/LS187	Final saturation confirmation (Unsteady State (USS), Oil-Water Primary Drainage Relative Permeability)
RC/LS188	Multi-rate USS imbibition brine-crude relative perm, elevated P & T - ISSM & mass balance
RC/LS189	Multi-rate USS imbibition brine-live oil rel perm, reservoir T & P, ISSM & mass balance
RC/LS190	Final saturation confirmation (USS, Imbibition Oil-Water Relative Perm)

RC/LS191	Multi-rate USS drainage gas - crude relative perm, elevated P, T - ISSM & mass balance
RC/LS192	Multi-rate USS drainage gas-live oil rel perm, reservoir T & P, ISSM and mass balance
RC/LS193	Gas-Water Relative Perm endpoint imbibition, ambient (USS: gas-water relative perm)
RC/LS194	Gas-Water Relative Permeability (endpoint) imbibition, elevated T & P, USS
RC/LS195	Porosity, Klinkenberg & air perm and GD, ambient conditions, lithological description
RC/LS196	Porosity and permeability (Air & Klinkenberg) at net confining stress
RC/LS197	High P mercury injection drainage curve only including pore throat, conventional
RC/LS198	High P mercury injection drainage curve only including pore throat, unconventional
RC/LS199	Sample saturation
RC/LS200	FRF, phi, "a" & "m", 6 Pressures
RC/LS201	Formation resistivity index - to be combined with Porous Plate Pc measurement
RC/LS202	Formation resistivity factor - plug, ambient T, OB pressure, determine m & a
RC/LS203	Electrical properties by continuous injection to determine n at ambient T
RC/LS204	Cation Exchange Capacity (CEC)
RC/LS205	Capillary Pressure by high speed centrifuge with automated data acquisition
RC/LS206	Simultaneous RI&Pc: Drainage & End point imbibition
RC/LS207	RI & PC by porous plate
RC/LS208	Effective permeability to gas @ Swi by pulse decay method (or equivalent)
RC/LS209	Water-gas relative permeability at ambient T and OB pressure (End point only)
RC/LS210	Effective permeability to water @ Sgr
RC/LS211	Core-NMR: T1, ambient temperature, as received
RC/LS212	Core-NMR: T2, ambient temperature, as received
RC/LS213	Saturation with live oil (isopar-I) at 10,000 psi back-pressure
RC/LS214	Core-NMR: T1, ambient temperature, oil saturated
RC/LS215	Core-NMR: T2, ambient temperature, oil saturated
RC/LS216	Saturation with brine (60 ppk) at 10,000 psi back-pressure
RC/LS217	Core-NMR: T1, ambient temperature, oil and water-saturated
RC/LS218	Core-NMR: T2, ambient temperature, oil and water-saturated
RC/LS219	High Frequency NMR T1/T2 Mapping at ambient conditions, per sample
RC/LS220	NMR Analysis
RC/LS221	Acoustic Velocity anisotropy analysis (AVAA):
RC/LS222	Acoustic Anisotropy: P-wave anisotropy measurements
RC/LS223	Pore Volume Compressibility
RC/LS224	Flow through miscible hot solvent cleaning to render plugs more water wet
RC/LS225	Conventional core flooding polymer injectivity for Indiana limestone core, RF & RRF
RC/LS226	Critical velocity measurements
RC/LS227	Kw with synthesized UER aquifer water (4 samples from RT1, 4 from RT2)
RC/LS228	Kw with synthesized clean produced water (PW) (No TSS/No OIW)
RC/LS229	Desaturation by porous plate
RC/LS230	Whole core preservation with wax - per ft, with core trimming & wax depreservation
RC/LS231	Establish Swi to requested value - Porous Plate - overburden pressure, single point

RC/LS232	Gas-water capillary pressure - porous plate
RC/LS233	Wormhole Image processing (Conventional CT)
RC/LS234	Computed Tomography (Conventional CT) scanning of plug
RC/LS235	Wormhole Image processing (Conventional CT)
RC/LS236	Computed Tomography (Conventional CT)
RC/LS237	Drilling trimming 1" samples, bagging, labeling, brief lithologic description
RC/LS238	Permeability impairment measurement with inhibitor-free FW/SW mixture: Effluent Elemental analysis by LC ICP MS for light metals.
RC/LS239	Permeability impairment with inhibitor-free FW/SW mixture in presence of residual oil. Effluent analysis by LC-ICP-MS for light metals
RC/LS240	Simulating squeeze treatment via coreflood and effluent analysis by LC-ICP-MS
RC/LS241	CT core flooding (water/oil/CO ₂) at Swi for screening studies

RESERVOIR FLUID

SR#	Capabilities
RF/LS1	PVT cell experiment: saturation pressure at reservoir conditions
RF/LS2	PVT cell experiment: constant composition expansion at reservoir conditions
RF/LS3	PVT cell experiment: gas injection or swelling test
RF/LS4	PVT cell experiment: differential liberation test (DV)
RF/LS5	PVT cell experiment: separator test
RF/LS6	Recombination Cell: regeneration of monophasic fluid
RF/LS7	HPHT viscometer: crude oil viscosity measurement
RF/LS8	Viscosity of crude oil at high P & T via electromagnetic viscometer
RF/LS9	HPHT density meter: crude oil density measurement
RF/LS10	Flash GOR
RF/LS11	Compositional analysis of natural gas samples
RF/LS12	Gas chromatograph (GC) composition analysis of crude oil up to C36+ fraction
RF/LS13	H2S & mercaptan composition analysis for gas samples by GC (SCD)
RF/LS14	H2S & mercaptan composition analysis for liquid samples by GC (SCD)
RF/LS15	High permeation liquid chromatography (HPLC)
RF/LS16	Thin layer chromatography (TLC)
RF/LS17	Fatty-acid-methyl-ester (FAME) analysis by Gas chromatography (GC)
RF/LS18	Trace petroleum compounds by chromatography
RF/LS19	SAR(A) analysis by high permeation liquid chromatography (HPLC)
RF/LS20	SAR(A) analysis by thin layer chromatography (TLC)
RF/LS21	Molecular weight determination using cryoscopy
RF/LS22	Asphaltene onset pressure (AOP) measurement at reservoir conditions
RF/LS23	Asphaltene onset concentration (AOC) measurement
RF/LS24	Spinning drop tensiometry for IFT measurement at reservoir condition

SR#	Capabilities
RF/LS25	Ambient rheometry
RF/LS26	HPHT rheometry
RF/LS27	Contact angle measurement for surface tension determination
RF/LS28	Spectral analysis using UV spectrophotometer
RF/LS29	Surfactant formulation by robotic platform
RF/LS30	Foam screening at HPHT
RF/LS31	Foam screening ambient pressure and high temperature
RF/LS32	Interfacial Tension (IFT) measurement by spinning drop tensiometry
RF/LS33	Glove box experiments (4 weeks)
RF/LS34	Auto-titration for surfactant quantification
RF/LS35	Total organic carbon using (TOC analyzer)
RF/LS36	Determination of total acid number (TAN) and base number (TBN) in crude oil
RF/LS37	Particle size distribution analysis (0.3-10 µm) in aqueous dispersions dispersions
RF/LS38	Zeta potential measurements (3.8-100 µm)
RF/LS39	Determination of inorganic scaling potential via differential scale loop (DSL)
RF/LS40	Studies on inorganic scale inhibitors effectiveness
RF/LS41	Acoustic measurement of particle size distribution
RF/LS42	Zeta potential analysis by electroacoustic technology
RF/LS43	Fluorescence spectral analysis
RF/LS44	Kinematic viscosity measurement
RF/LS45	Centrifugation of fluids
RF/LS46	pH determination
RF/LS47	Sonication of dispersions
RF/LS48	Conductivity measurement
RF/LS49	Turbidity measurements
RF/LS50	Microscopic image analysis
RF/LS51	CHNS/O elemental analysis
RF/LS52	Molecular weight determination of polymer by gel permeation chromatograph (GPC)
RF/LS53	Impedance analysis of fluid
RF/LS54	FTIR spectral analysis for solids and liquid
RF/LS55	Near infrared (NIR) spectral analysis of fluids/solids
RF/LS56	Electron spin resonance (ESR) spectral analysis
RF/LS57	Refractive index (RI) measurement at ambient condition
RF/LS58	Refractive index measurement at different temperatures
RF/LS59	Moisture content analysis by halogen moisture analyzer
RF/LS60	Thermal treatment of samples
RF/LS61	Mass measurement by quartz crystal microbalance (QCM)
RF/LS62	Separation of solvents using rotary evaporator

SR#	Capabilities
RF/LS63	Organic analysis by coupled liquid chromatography-mass spectrometry (LC-MS)
RF/LS64	Organic analysis by coupled gas chromatography-mass spectrometry GC-MS
RF/LS65	Total organic content (TOC) and nitrogen (TN) determination
RF/LS66	Total petroleum hydrocarbon and gas composition using GC
RF/LS67	Oil content determination in water
RF/LS68	Mercury content determination in water
RF/LS69	Water pilot plant studies: reverse osmosis (RO), microfiltration (MF), coagulation/floc
RF/LS70	Digestion system, total nitrogen (TN) and ammonia estimation
RF/LS71	Crude oil density measurement - ambient
RF/LS72	Crude oil viscosity measurement - ambient
RF/LS73	Density measurement for non-oil-based liquid sample
RF/LS74	Viscosity measurement for non-oil-based liquid sample
RF/LS75	Solvent extraction
RF/LS76	Gravimetric adsorption studies
RF/LS77	Gas-liquid or liquid-liquid sorption studies
RF/LS78	HPHT viscosity and viscoelasticity of liquids
RF/LS79	Minimum Miscibility Pressure test (MMP)
RF/LS80	Fingerprint analysis by FTIR
RF/LS81	Shear degradation
RF/LS82	Powder sieve analysis
RF/LS83	Filtration
RF/LS84	Intrinsic viscosity measurement
RF/LS85	Viscosity at determination different shear rates bulk rheology
RF/LS86	Visual check of consistency and homogeneity of dilute polymer solutions
RF/LS87	Calorific value measurement by microcalorimeter
RF/LS88	SARA screen plot (fraction vs weight %)
RF/LS89	Extraction of 1g of C7 asphaltene from the collected dead crude via IP 143
RF/LS90	Asphaltene inhibitor performance evaluation
RF/LS91	Liquid, Cation by ICP-MS per element
RF/LS92	Normal Metals, by LC-ICP-MS per element
RF/LS93	Solid, metal by ICP-MS per element
RF/LS94	Heavy metal by LC-ICP-MS per element
RF/LS95	Solid, metal by LC-ICP-MS per element
RF/LS96	Surfactant Analysis - by HPLC
RF/LS97	Asphaltene content (nC7 insoluble) of filtered/unfiltered samples by IP 143.
RF/LS98	Measurment of S1, S2, S3, H index, OI, PC, RC by bulk rock method using RockEval
RF/LS99	Organic Amines by GC-FID
RF/LS100	Moisture content measurement by gravimetric - Oven
RF/LS101	Insoluble content by filtration setup

SR#	Capabilities
RF/LS102	Elemental analysis by LC ICP MS heavy metals
RF/LS103	Elemental analysis by LC ICP MS Light metals
RF/LS104	Cations by LC ICP MS ICP
RF/LS105	Resistivity measurement for non-oil-based liquid sample
RF/LS107	Synthetic brine preparation, filtration, brine density, resistivity & viscosity measurement
RF/LS108	ICP-MS analysis (Aluminium, Cobalt, Chromium, Iron, Nickel, Platinum)
RF/LS109	Viscosity measurement of stock and diluted solutions
RF/LS110	Filterability test
RF/LS111	Viscosity measurement of stock and diluted solutions by Rheometer
RF/LS112	Brine - density, pH & conductivity and TDS
RF/LS113	Brine and polymer sample preparation
	Visual check: consistency and homogeneity of dilute polymer solutions
RF/LS114	Effluent collection and viscosity (non-oil based) measurement at 10 s-1
RF/LS115	Mechanical Viscosity Degradation
RF/LS116	SARA Analysis - SARA analysis of oil sample by HPLC and IP 143.
RF/LS117	WAT - WAT by Cross Polar Microscopy (CPM).
RF/LS118	IFT measurement of dead crude-brine at lab conditions, by Pendant Drop method
RF/LS119	IFT measurement of dead crude-brine at reservoir condition, Pendant Drop method
RF/LS120	IFT Measurements - Gas / Oil at reservoir conditions, Pendant Drop method
RF/LS121	IFT measurement of gas-brine at reservoir condition, Pendant Drop method
RF/LS122	Validation - BHS/WHs
RF/LS123	Separator Liquid Validation
RF/LS124	Separator Gas Validation
RF/LS125	Validation of openhole chambers and sample transfer
RF/LS126	Restoration - Homogenization of sample in sample cylinder to Tres (restoration T)
RF/LS127	Restoration - Asphaltene - Sample restoration for 5 days at reservoir P & T
RF/LS128	Transfer of pressurised sample into lab cylinders or other approved company cylinders.
RF/LS129	Saturation Pressure - Tres - Determination of saturation P at Reservoir T
RF/LS130	Entrained Water Content from pressurised oil sample (10 ml) by Karl Fischer method
RF/LS131	Thermal dehydration of sample at elevated T to sample cylinder
RF/LS132	Chemical dehydration of sample at elevated T by adding demulsifier to sample cylinder
RF/LS133	Atmospheric separation & compositional analysis of pressurised reservoir liquid sample to C36+
RF/LS134	Calculation of well stream composition to a specific GOR
RF/LS135	Analysis -Separator Liquid Sample
RF/LS136	Compositional Analysis - Extraction of OBM from drilling fluid and analysis of sample to C36+
RF/LS137	Contamination OBM - Calculation - Determination of drilling fluid
	Contamination (wt%) and calculation of uncontaminated reservoir fluid composition
RF/LS138	Composition - STO - Compositional analysis of stock tank oil to C36+ by GC
RF/LS139	Determination of sulfur compounds in NG and gas fuels by GC and chemiluminescence

SR#	Capabilities
RF/LS140	Determination of S compounds in petroleum liquids by GC and selective detection
RF/LS141	Sulfur Species Analysis in Pressurized Fluid
RF/LS142	Recombination - GOR
RF/LS143	Recombination - Saturation Pressure
RF/LS144	CCE - BO (Constant Composition Expansion – Black Oil)
RF/LS145	CCE - VO (Constant Composition Expansion – Volatile Oil)
RF/LS146	CCE - Gas Condensate - Constant composition expansion (CCE) at reservoir T
RF/LS147	CCE - Wet/Dry Gas - Constant composition expansion (CCE) at reservoir T
RF/LS148	DV (Differential Vaporisation - Black Oil) - Differential vaporisation at reservoir T
RF/LS149	Constant Volume Depletion (CVD) – Gas Condensate)
RF/LS150	CVD and analyses of equilibrium phase gas composition up to C36+
RF/LS151	CVD - Additional stages beyond 6
RF/LS152	ST - Single stage separator test on Black Oils
RF/LS153	ST - Two Stage - Multi stage separator test
RF/LS154	ST - Three Stages - Multi stage separator test
RF/LS155	Oil Visc - Viscometer (Black Oil or Volatile Oil)
RF/LS156	Viscosity of reservoir oil at reservoir T
RF/LS157	GWR analysis on pressurized water sample
RF/LS158	Gas Validation (collected injection gas) - Validation of separator gas sample
RF/LS159	Constant composition expansion (CCE) of injection gas at reservoir T
RF/LS160	Compressibility (z-factor) of injection gas at injection P & T (ambient, reservoir)
RF/LS161	Minimum Miscibility Study (MMP)
RF/LS162	CVD and analyses of equilibrium phase gas composition up to C36+
RF/LS163	Asphaltene Onset Pressure (AOP) via HP Microscopy and Near Infrared analysis (NIR)
RF/LS164	AOP - Sequential titration of reservoir fluid with injection gas in NIR system, asphaltene onset as a function of GOR (fixed P, reservoir T)
RF/LS165	AOP – HPM and NIR on blended oil/gas sample - preparation of swollen fluid blend for isothermal depressurization experiment
RF/LS166	AOP Bulk Precipitation using HPHT filtration
RF/LS167	Water Basic properties - pH, conductivity, density and alkalinity
RF/LS168	Microbial analysis (incubation) - Microbial analysis by MPN
RF/LS169	TSS - TSS by filtration
RF/LS170	API "12 ion" analysis on water - Service includes:
	Elemental analysis by ICP-AES
RF/LS171	Total Iron - Total Iron by ICP-AES
RF/LS172	TDS - TDS by Gravimetric
RF/LS173	ICP-OES analysis of Strontium by ASTM 1976
RF/LS174	Filter Analysis - Filter Analysis - SEM Analysis of Solids
RF/LS175	Nitrate / Phosphate / Bromide - Nitrate / Phosphate / Bromide by IC
RF/LS176	Particle Size Distribution (PSD) - Particle Size Distribution (PSD) Coulter Counter

SR#	Capabilities
RF/LS177	Oil in Water - Oil in Water by IR Absorbance (Infracal)
RF/LS178	Ash analysis plus determination of alkali & other metals by ICP (Fe, Na, Ca, Mg, Sr, Ba, P, Si and S as Sulphate) by ICP-AES
RF/LS179	Metal analysis plus determination of heavy metals by ICP (Pb, Ni, Cd, Co, Cr, Mn, Be, Cu, Mo, Bi, Zn and Ni) by ICP-AES
RF/LS180	Ash content by ASTM D482.
RF/LS181	Asphaltenes content (C5) by gravimetric.
RF/LS182	Asphaltenes content (C7) by IP 143.
RF/LS183	Density @ 60°F by digital densitometer.
RF/LS184	Water Content by ASTM D95.
RF/LS185	Water content by Karl Fisher by ASTM D4928.
RF/LS186	Scale / Sludge / Deposit Analyses
RF/LS187	Additional elements - Additional elements by ICP-AES
RF/LS188	Wax Content by UOP 46/64
RF/LS189	Solvent extraction of sample using Dichloromethane (DCM) to dissolve organics
RF/LS190	FTIR Analysis
RF/LS191	IFT / Contact angle measurement by Pendant Drop method
RF/LS192	Preparation of synthetic brine sample to measured or supplied water composition
RF/LS193	Foaming characteristics - Determination by IP 146 method
RF/LS194	Glycol Analysis by modified ASTM D4291
RF/LS195	Analysis of additional sample for glycol content (MEG, DEG, TEG) by modified ASTM D4291
RF/LS196	Elemental Sulfur Solvent Performance: 6-hour Uptake Test, (<10 ppm H ₂ S, T<80°C), NACE 7783
RF/LS197	Elemental Sulfur Solvent Performance: 48-hour HP/HT PVT Cell Uptake Test (< 10 ppm H ₂ S, T<100°C, P<5000 psi), SPE 207845
RF/LS198	Polymer static adsorption - Surface Area, TOC/TN pre- and post-filtration
RF/LS199	Polymer static adsorption - XRF of pulverized core
RF/LS200	FRF, phi, "a" & "m", 6 Pressures
RF/LS201	Longterm and accelerated thermal stability test, Glove box, Bulk Rheology, FTIR
RF/LS202	Polymner solution - solubility, stability, turbidity, transmittance, hydration time
RF/LS203	Stock tank Fluid preparation (includes Density and Viscosity)
RF/LS204	Compositional analysis of brine to assess formation damage, API12 ION
RF/LS205	FD-specific scanning electron microscopy (SEM) examination (after test)
RF/LS206	Water content in Hydrocarbons
RF/LS207	Loss on Ignition (LOI) at specified high T (110°C, 550°C, 950°C)
RF/LS208	Dissolved Gases (Additional) under pressure
RF/LS209	Solubility in Water, 15% HCl and Hydrocarbon Solvents (≤100°C)
RF/LS210	Solubility in Scale Dissolver, Xylene and Heavy Naphtha Chemicals
RF/LS211	Hardness water samples
RF/LS212	Dissolved Oxygen(DO)
RF/LS213	Total Suspended solids

SR#	Capabilities
RF/LS214	Oil and Grease by Oil analyzer
RF/LS215	FTIR analysis to identify the polymeric material
RF/LS216	Quantification of fluorescent material (Sodium Naphthionate)
RF/LS217	Inorganic Scale Inhibitor Minimum Effective Dosage Determination
RF/LS218	C isotope analysis of C1-C5, CO ₂ , H isotopes of CH ₄ , N isotopes of N ₂
RF/LS219	Gas Chromatography of extracted hydrocarbon
RF/LS220	Rock-Eval 6 Pyrolysis, including calculated TOC (pre/post extracted samples)
RF/LS221	Acid Digestion @ 110C HCl
RF/LS222	FW + SW worst-case scaling mixture from thermodynamic analysis using DSL apparatus
RF/LS223	Optional: Worst-case mixture selection through different mixture ratios in DSL
RF/LS224	Inhibitor minimum effective dosage with DSL
RF/LS225	Helium contents in natural Gas by GC
RF/LS226	Equipment setup for RF/LS225 test
RF/LS227	Water & Sediment in Crude Oil
RF/LS228	Phenol in water and wastewater by HACH Spectrophotometer
RF/LS229	NH ₃ -N in Water, Wastewater, and Seawater
RF/LS230	HACH for Total Iron in water, waste- and seawater via powder pillows or accuracy ampuls
RF/LS231	Total Chloride in Water, Wastewater and Sea Water
RF/LS232	Total Dissolved Solids
RF/LS233	Chloride Concentration by Titration Method
RF/LS234	Basic Nitrogen by Potentiometric Titration
RF/LS235	Viscosity by Stabinger Viscometer
RF/LS236	Viscosity, Index (if only VI is requested)
RF/LS237	Kinematic Viscosity (Transparent)
RF/LS238	Kinematic Viscosity (Opaque)
RF/LS239	Sodium naphthionate tracer preparation

INNOVATION CLUSTER 2: NEXGEN SOLUTIONS

ELECTRIFICATION AND ENERGY STORAGE

SR#	Services
EES/LS1	Climatic chamber testing of new/emerging battery types under different load/temperature and humidity conditions

RENEWABLE AND SUSTAINABLE ENERGY PRODUCTION

SR#	Services
RSEP/LS1	Hydrogen production capacity-testing for electrolyzer systems
RSEP/LS2	Natural gas pyrolysis systems testing

NOVEL ENERGY STORAGE MATERIALS

SR#	Services
NESM/LS1	Cyclic thermogravimetry
NESM/LS2	Sorbent evaluation

CARBON CAPTURE, UTILIZATION AND STORAGE (CCUS)

SR#	Services
CCUS/LS1	Gas hydrate onset detection and solubility
CCUS/LS2	Supercritical carbon dioxide properties, transportation, and storage investigations
CCUS/LS3	Liquid-based carbon dioxide absorption investigations for direct air capture (DAC)

GAS PROCESSING

SR#	Services
CTLSS/LS1	Candidate materials mixing and pelletization for lab-scale gas processing tests
CTLSS/LS2	Candidate materials mixing and pelletization for pilot-scale gas processing tests
CTLSS/LS3	Preparation of dies and beds of candidate materials
CTLSS/LS4	Materials evaluation and screening using lab-scale plants
CTLSS/LS5	Materials evaluation and screening using pilot-scale plants
CTLSS/LS6	Simulation of material aging and poisoning processes
CTLSS/LS7	Humidity generation

ABSORBENTS AND EXTRACTION

SR#	Services
AE/LS1	High pressure static analysis and gas solubility screening of absorbents
AE/LS2	Coupled liquid chromatography and mass spectrometry (LC-MS) to qualify and quantify separation products
AE/LS3	Coupled gas chromatography and mass spectrometry (GC-MS) to qualify and quantify separation products

ADSORBENTS AND MEMBRANE SEPARATION

SR#	Services
AMS/LS1	Membrane fabrication
AMS/LS2	Lab-scale permeation rig testing

NON-METALLICS AND COMPOSITES MATERIALS

SR#	Services
NMC/LS1	Pipe dissection
NMC/LS2	Mechanical performance testing via rheometry
NMC/LS3	Mechanical failure testing via burst-testing

SR#	Services
NMC/LS4	Mechanical failure testing via ultimate tensile stress (UTS) measurement
NMC/LS5	Thermal transition determination and measurement via differential scanning calorimetry (DSC)
NMC/LS6	Thermal transition determination and measurement via thermogravimetric analysis (TGA)

SERVICE PLATFORM 1: MATERIALS BLUEPRINTING

MATERIALS STRUCTURAL, TEXTURAL AND COMPOSITIONAL ANALYSIS

SR#	Services
STC/LS1	Pore size analysis by gas adsorption
STC/LS2	Specific surface area and pore size analysis by BET method (mesoporous samples)
STC/LS3	Specific surface area and pore size analysis by BET method (microporous samples)
STC/LS4	Thermogravimetric analysis (TGA)
STC/LS5	Coupled gas chromatography and mass spectrometry (GC-MS)
STC/LS6	Solid, powder and industrial waste sample characterization by reduction, desorption, oxidation & pulse titration
STC/LS7	Scanning electron microscopy (SEM) with imaging and elemental analysis via energy dispersive spectroscopy (EDS)
STC/LS8	Crystallographic analysis by X-ray diffractometer (XRD)
STC/LS9	Imaging by transmission electron microscopy (TEM) with energy-dispersive spectroscopy (EDS)
STC/LS10	Energy electron loss spectroscopy (EELS)
STC/LS11	Electron diffraction (ED)
STC/LS12	Scanning transmission electron microscopy (STEM)
STC/LS13	Chemical and molecular analysis by confocal Raman microscopy
STC/LS14	Specimen cutting into thin slices at thickness range of 20-150 nm for TEM analysis

GAS PROCESSING

SR#	Services
GPC/LS1	Adsorbent screening (lab scale)
GPC/LS2	Membrane development for various gas components (CO ₂ , H ₂ S, BTEX) separation
GPC/LS3	Gas treatment studies
GPC/LS5	Deactivation tests of molecular sieve materials

POLYMERS AND COMPOSITES

SR#	Services
PC/LS1	Tensile strength/elongation by UTM
PC/LS2	Polymer blending by batch mixer
PC/LS3	Rheology properties at HT for solid and liquid samples by rheometer

SR#	Services
PC/LS4	Glass transitions, crystallization, phase changes, melting, crystallization, product stability, cure/cure kinetics and oxidative stability by DSC
PC/LS5	Polymer/polymer composite blending by extrusion
PC/LS6	Specimen preparation by hot press
PC/LS7	Polymer blending by injection molding
PC/LS8	Thermal conductance properties measurement by laser flash analyzer
PC/LS9	Titration analysis by auto titrator
PC/LS10	Environmental studies on materials

ELECTROCHEMISTRY AND CORROSION

SR#	Services
ECC/LS1	UHPLC-MS/MS, triple TOF, metabolic profiling, analysis of organic pollutants
ECC/LS2	Real-time PCR cyclo-rotor geneQ, detection, quantification and typing of different microbial agents
ECC/LS3	Next generation sequencer. MiSeq, DNA and RNA sequencing and variant/mutation detection
ECC/LS4	Corrosion cracking test
ECC/LS5	Salt spray corrosion test
ECC/LS6	Shear stress test on corrosion inhibitors
ECC/LS7	Slow strain rate testing of copper in sulfide rich chloride containing deoxygenated water at 90°C
ECC/LS8	Contaminants study
ECC/LS9	UHPLC-MS/MS, triple TOF, Microbiological induced corrosion studies
ECC/LS10	Real-time PCR cyclo-rotor geneQ, detection, quantification and typing of different microbial agents for biocorrosion
ECC/LS11	Next generation sequencer. MiSeq, DNA and RNA sequencing and variant/mutation detection for biocorrosion

SERVICE PLATFORM 2: 360 VISUALIZATION

3D IMAGING

SR#	Services
3DI/LS1	Conventional computed tomography scanning for reservoir core samples
3DI/LS2	In-situ flow visualization
3DI/LS3	Micro-computed tomography

2D IMAGING

SR#	Services
2DI/LS1	Gamma-ray scanning

2DI/LS2	In-situ flow visualization
2DI/LS3	Linear X-ray scanning

MICROSCOPY

SR#	Services
MY/LS1	Optical microscopy
MY/LS1	Transmission electron microscopy (TEM)
MY/LS2	Scanning transmission electron microscopy (STEM)
MY/LS3	Scanning electron microscopy (SEM)
MY/LS4	Elemental and phase mapping by SEM
MY/LS5	Elemental and phase mapping by TEM
MY/LS6	Confocal Raman microscopy

SERVICE PLATFORM 3: QUALITY ASSURANCE

DRILLING FLUIDS

SR#	Services
DF/LS1	Bentonite rheology and filtration
DF/LS2	Biopolymer borate sensitivity
DF/LS3	Biopolymer rheology
DF/LS4	Qualitative starch determination in biopolymer
DF/LS5	Dry sieve analysis
DF/LS6	Barite cation exchange capacity (methylene blue test)
DF/LS7	Corrosion inhibitor packer fluids efficiency
DF/LS8	Corrosion inhibitor packer fluids miscibility
DF/LS9	Density by gas pycnometer
DF/LS10	Drilling defoamer for monovalent brines efficiency
DF/LS11	Pipe free agent filter cake cracking
DF/LS12	Guar gum rheology
DF/LS13	Acid solubility
DF/LS14	Hydrated lime purity
DF/LS15	Iron content in calcium chloride
DF/LS16	Moisture content by oven
DF/LS17	Moisture content by moisture analyzer
DF/LS18	Mud detergent water miscibility
DF/LS19	Particle size distribution by light scattering
DF/LS20	pH of aqueous solutions
DF/LS21	Polyglycol cloud point

SR#	Services
DF/LS22	Potassium chloride purity by potentiometric method
DF/LS23	Potassium chloride purity by ion selective electrode method
DF/LS24	Pour point
DF/LS25	Sodium bicarbonate purity
DF/LS26	Solids content by moisture analyzer
DF/LS27	Density by portable digital density meter
DF/LS28	Density by DMA500 digital density meter
DF/LS29	Density of viscous liquids by gravimetric
DF/LS30	Starch rheology and filtration
DF/LS31	Sulfate content by spectrophotometer (turbidity)
DF/LS32	Turbidity
DF/LS33	Water insoluble matter
DF/LS34	Water soluble alkaline earth metals as calcium by manual titration
DF/LS35	Water soluble alkaline earth metals in barite by calcium ion selective electrode
DF/LS36	Water soluble alkaline earth metals in barite by copper ion selective electrode
DF/LS37	Barite residue of diameter greater than 75 µm
DF/LS38	Performance of zinc carbonate
DF/LS39	Conductivity of aqueous solutions

CEMENTING FLUIDS

SR#	Services
CF/LS1	Determination of slurry density
CF/LS2	Well stimulation compressive strength test
CF/LS3	Non-destructive sonic determination of compressive strength of cement
CF/LS4	Well stimulation thickening time
CF/LS5	Fluid loss test
CF/LS6	Determination of rheological properties and gel strength using a rotational viscometer
CF/LS7	Sedimentation test
CF/LS8	Free fluid test with static period at ambient temperature
CF/LS9	Expansion test
CF/LS10	Determining the static gel strength of cement formulations

STIMULATION FLUIDS

SR#	Services
SF/LS1	Corrosion rate
SF/LS2	Crude oil/acid emulsion
SF/LS3	Sludge content
SF/LS4	Acid solubility
SF/LS5	QC of raw acid specific gravity/strength and iron content

PRODUCTION CHEMISTRY

SR#	Services
PCY/LS1	Water and sediment in crude oil by the centrifuge method
PCY/LS2	Salts-in-crude oil (electrometric method)
PCY/LS3	Determination of pH
PCY/LS4	Determination of water density/SG by digital density meter
PCY/LS5	Determination of electrical conductivity
PCY/LS6	Determination of cations in water by ICP
PCY/LS7	Determination of anions in water by ion chromatography
PCY/LS8	Total solids dried at 103-105°C
PCY/LS9	Alkalinity
PCY/LS10	Determination of chloride by titration
PCY/LS11	Sulphate by spectrophotometer
PCY/LS12	Density, relative density, and API gravity of crude oils by digital density analyzer
PCY/LS13	Scale, deposit, and sludge analysis
PCY/LS14	Total dissolved solid dried at 180°C
PCY/LS15	Total suspended solid dried at 103-105°C
PCY/LS16	Residual corrosion inhibitor in water
PCY/LS17	Identification of crystalline compounds in deposits by x-ray diffraction
PCY/LS18	Determination of iron in water

PRODUCTION CHEMICALS

SR#	Services
PCL/LS1	Density and relative density of liquids by digital density meter
PCL/LS2	Determination of density by oscillating tube
PCL/LS3	Flash point by modified continuous closed cup
PCL/LS4	Dynamic viscosity by viscometer
PCL/LS5	Miscibility of production chemicals
PCL/LS6	pH of aqueous solutions with glass electrode
PCL/LS7	Appearance of clear and transparent liquids (visual inspection)
PCL/LS8	Obtaining FTIR spectra using internal reflection spectroscopy
PCL/LS9	Water content in liquids by coulometric KF titration
PCL/LS10	Flash Point by Continuous Closed Cup (CCCFP)
PCL/LS11	Suspended matters and sediments in triethylene glycol (TEG) by centrifuge
PCL/LS12	pH of TEG
PCL/LS13	Sulfite content in oxygen scavenger by iodometric method
PCL/LS14	Thermal stability
PCL/LS15	Color by colorimeter
PCL/LS16	Nonvolatile residue (dry weight)

SR#	Services
PCL/LS17	Loss-on-drying by thermogravimetry
PCL/LS18	Color of liquids using colorimetry (platinum - cobalt scale)
PCL/LS19	Available chlorine in sodium hypochlorite

SERVICE PLATFORM 4: CENTRAL FACILITIES

SR#	Services
CW/LS1	Rapid prototyping
CW/LS2	Machining
CW/LS3	Fabrication work
CW/LS4	3D Printing
CW/LS5	Digitalization, modeling, and data analysis
CW/LS6	Design and reporting

EQUIPMENT

INNOVATION CLUSTER 1: SUBSURFACE INTELLIGENCE

RESERVOIR CORE

SR#	Lab Equipment
RC/LE1	Core flooding system
RC/LE2	Flow-through core cleaning system
RC/LE3	Core cutting/trimming/grinding machine
RC/LE4	Core plug saturator
RC/LE5	Liquid chromatograph with inductively coupled plasma mass spectrometer (LC-ICP-MS)
RC/LE6	Plug sample zeta potential analyzer
RC/LE7	HPHT capillary viscometer
RC/LE8	Acidizing core flooding system
RC/LE9	Acoustic testing machine
RC/LE10	Acoustic core flooding system
RC/LE11	Pycnometer
RC/LE12	Core flooding rigs for measuring K_w and K_o
RC/LE13	Gamma attenuation core flood rig
RC/LE14	Helium porosimeter
RC/LE15	Conventional CT scanning and core flooding system
RC/LE16	Gas permeameter
RC/LE17	Multistage centrifuge
RC/LE18	HPHT interfacial tension cell
RC/LE19	LXRS core flooding system
RC/LE20	Core plug aging cell
RC/LE21	Capillary pressure resistivity
RC/LE22	Dean-stark core saturation analyzer
RC/LE23	CHNS elemental analyzer
RC/LE24	Multi-extraction soxhlet unit
RC/LE25	HPHT Amott cells
RC/LE26	Rock pore and bulk compressibility measurement system
RC/LE27	Isotope ratio mass spectrometer with dual inlet system
RC/LE28	Carbonate analyzer and isotope ratio mass spectrometer
RC/LE29	Continuous flow interface
RC/LE30	CHNS/O elemental analyzer
RC/LE31	Gas bench interface and GC autosampler
RC/LE32	Gas chromatograph
RC/LE33	Handheld x-ray fluorescence (XRF) analyzer

SR#	Lab Equipment
RC/LE34	Gas chromatograph with autosampler
RC/LE35	Coupled gas chromatograph and mass spectrometer (GC-MS) with autosampler
RC/LE36	Accelerated solvent extraction system
RC/LE37	Source rock analyzer (TOC)
RC/LE38	NMR rock core analyzer (2 MHz)
RC/LE39	Automated lapping, grinder and polisher machine
RC/LE40	Manual polishing machine
RC/LE41	Trimming machine
RC/LE42	Fourier transform infrared spectrometer (FT-IR)
RC/LE43	Bench top centrifuge
RC/LE44	Polarized light microscope
RC/LE45	Spectrophotometer
RC/LE46	Stereomicroscope
RC/LE47	Electronic desiccator
RC/LE48	Sieve shaker
RC/LE49	Particle size analyzer (30 µm - 30 mm)
RC/LE50	Particle size analyzer (1 µm - 3 mm)
RC/LE51	Ultracentrifuge
RC/LE52	Conventional CT scanner
RC/LE53	Micro-CT scanner

RESERVOIR FLUID

SR#	Lab Equipment
RF/LE1	Slim tube
RF/LE2	Liquid hydrocarbon analyzer gas chromatograph with FID detector
RF/LE3	Natural gas analyzer chromatograph with TCD and FID detector
RF/LE4	Fourier Transform Infrared spectroscopy (FTIR) spectrometer and accessories
RF/LE5	Fluorescence spectrophotometer
RF/LE6	Gas Chromatograph (GC)
RF/LE7	Acoustic and electroacoustic spectrometer
RF/LE8	Benchtop near infrared (NIR) spectrometer for crude oil and fuel analysis

SR#	Lab Equipment
RF/LE9	Cryoscope
RF/LE10	Automatic viscometer
RF/LE11	Automatic potentiometric titrator
RF/LE12	Automatic refractometer - high temperature (HT)
RF/LE13	Benchtop centrifuge
RF/LE14	Density meter
RF/LE15	Digital microscope
RF/LE16	Digital muffle furnace
RF/LE17	Gel permeation chromatograph (GPC)
RF/LE18	HPHT electromagnetic viscometer
RF/LE19	Volumetric titrator
RF/LE20	Coulometric titrator
RF/LE21	Particle size and zeta potential analyzer
RF/LE22	Ultrasound sonicator
RF/LE23	Benchtop laboratory turbidimeter
RF/LE24	Automated Soxhlet extraction unit
RF/LE25	Benchtop micro-ESR spectrometer
RF/LE26	Differential Scale Loop (DSL)
RF/LE27	Elemental analyzer for CHNS/O
RF/LE28	Flow Assurance System (FLASS)
RF/LE29	Gas oil ratio (GOR) apparatus
RF/LE30	Halogen moisture analyzer
RF/LE31	HPLC with UV vis detector/RI detector
RF/LE32	Thin layer chromatograph with FID/FPD detectors
RF/LE33	Impedance analyzer with liquid test fixture
RF/LE34	Multistage separator equipment
RF/LE35	Quartz crystal microbalance
RF/LE36	Recombination cell apparatus
RF/LE37	Capillary viscometer
RF/LE38	Double stigma pump
RF/LE39	Flash equilibrium separator
RF/LE40	High-pressure-high-temperature density meter
RF/LE41	High-pressure-high-temperature PVT system
RF/LE42	High pressure high temperature recombination cell
RF/LE43	Quad PVT cell
RF/LE44	Solid detection system
RF/LE45	Viscometer
RF/LE46	Automatic gravimetric high pressure sorption analyzer
RF/LE47	Hydrate cell - vapor liquid equilibrium (VLE) cell
RF/LE48	Interfacial tension equipment

SR#	Lab Equipment
RF/LE49	Titanium acid gas absorption cell and GC
RF/LE50	VLE - vapor liquid equilibrium cell to measure density and composition of absorbed gas
RF/LE51	Spinning drop tensiometer
RF/LE52	Force and optical tensiometer
RF/LE53	UV spectrophotometer
RF/LE54	High Permeation Liquid Chromatography (HPLC) with ELSD and PDA detectors
RF/LE55	Robotic platform for formulation
RF/LE56	Glove box
RF/LE57	HPHT foam screening
RF/LE58	Total organic carbon/nitrogen analyzer
RF/LE59	Rheometer
RF/LE60	LCMSMS
RF/LE61	GCMS
RF/LE62	GC - FID/TCD
RF/LE63	Oil content analyzer
RF/LE64	Mercury analyzer
RF/LE65	Digestion system

INNOVATION CLUSTER 2: NEXGEN SOLUTIONS

ELECTRIFICATION AND ENERGY STORAGE

SR#	Lab Equipment
EES/LE1	High power/high voltage bi-directional DC power supply
EES/LE2	Hazard-5 climate chamber
EES/LE3	Battery and energy management software/hardware

RENEWABLE AND SUSTAINABLE ENERGY PRODUCTION

SR#	Lab Equipment
RSEP/LE1	Electrolyzer test bench

NOVEL ENERGY STORAGE MATERIALS

SR#	Lab Equipment
NESM/LE1	Cyclic thermogravimetric analyzer
NESM/LE2	Adsorption test unit (ATU)

CARBON CAPTURE UTILIZATION AND STORAGE (CCUS)

SR#	Lab Equipment
CCUS/LE1	VLE equilibrium sapphire cell
CCUS/LE2	High pressure static analyzer (VLLE, VLE, gas solubility)
CCUS/LE3	Supercritical CO ₂ and injectivity apparatus
CCUS/LE4	CO ₂ behavior and transfer apparatus
CCUS/LE5	CO ₂ leakage simulator
CCUS/LE6	Gas chromatograph
CCUS/LE7	Mass spectrometer
CCUS/LE8	Stable isotope analyzer

CATALYSIS

SR#	Lab Equipment
CT/LE1	NH ₃ /CO ₂ Temperature Programmed Desorption (TPD) unit
CT/LE2	Catalyst mixer
CT/LE3	Catalyst press
CT/LE4	Lab-scale reactor
CT/LE5	Pilot plant reactor

ABSORBENTS AND EXTRACTION

SR#	Lab Equipment
AE/LE1	Titanium acid gas absorption cell
AE/LE2	Absorption rig

ADSORBENTS AND MEMBRANE SEPARATION

SR#	Lab Equipment
AMS/LE1	Mesoporous/microporous adsorption analyzer
AMS/LE2	Adsorption test unit
AMS/LE3	Membrane separation rig

NON-METALLICS AND COMPOSITES MATERIALS

SR#	Lab Equipment
NMC/LE1	Non-metallic pipe dissection kit
NMC/LE2	Burst-testing equipment
NMC/LE3	Ultimate tensile-testing machine (UTM)
NMC/LE4	Rheometer
NMC/LE5	Differential scanning calorimeter
NMC/LE6	Thermogravimetric analyzer

SERVICE PLATFORM 1: MATERIALS BLUEPRINTING

MATERIALS STRUCTURAL, TEXTURAL AND COMPOSITIONAL ANALYSIS

SR#	Lab Equipment
STC/LE1	Confocal Raman microscope
STC/LE2	Scanning electron microscope (SEM-EDX)
STC/LE3	X-ray diffractometer (XRD)
STC/LE4	Transmission electron microscope (TEM)
STC/LE5	Ultramicrotome
STC/LE6	Microporous powder adsorption analyzer
STC/LE7	Mesoporous powder adsorption analyzer
STC/LE8	Gas chromatograph
STC/LE9	Gas chromatograph - mass spectrometer (GC-MS)
STC/LE10	Thermo gravimetric analyzers (TGA)
STC/LE11	Brunauer–Emmett–Teller (BET) analyzer (micropores and mesopores)
STC/LE12	Total organic carbon (TOC) analyzer
STC/LE13	Temperature programmed desorption (TPD) mass spectrometry

GAS PROCESSING AND CATALYSIS

SR#	Lab Equipment
GPC/LE1	Horizontal furnace
GPC/LE2	Catalyst mixer
GPC/LE3	Catalyst press
GPC/LE4	Nitrogen generator
GPC/LE5	Adsorption testing unit (ATU)
GPC/LE6	Humidity chamber
GPC/LE7	Membrane applicator
GPC/LE8	Dry box with dehumidifier
GPC/LE9	Gas permeation test rig
GPC/LE10	Spectrophotometer, digital reactor
GPC/LE11	Turbidity and free/total chlorine meter
GPC/LE12	Dissolved oxygen meter

POLYMERS AND COMPOSITES

SR#	Lab Equipment
PC/LE1	FT-IR spectrometer
PC/LE2	Centrifuge
PC/LE3	Multi-high probe test unit
PC/LE4	Sieve shaker
PC/LE5	Sonicator

SR#	Lab Equipment
PC/LE6	Universal tensile-testing machine (UTM)
PC/LE7	Batch mixer
PC/LE8	Clicker press
PC/LE9	Gas rig with data acquisition system
PC/LE10	Dilatometer with vacuum pump and nitrogen canister
PC/LE11	Rheometer
PC/LE12	Differential scanning calorimeter (DSC)
PC/LE13	Extruder
PC/LE14	Injection-molding machine
PC/LE15	Laser flash analyzer
PC/LE16	Moisture analyzer
PC/LE17	Thermogravimetric analyzer (TGA)
PC/LE18	Autotitrator with dosing unit
PC/LE19	Tubular furnace
PC/LE20	Viscometer
PC/LE21	Environmental climate chamber

ELECTROCHEMISTRY AND CORROSION

SR#	Lab Equipment
ECC/LE1	HPHT jet impingement system
ECC/LE2	Stress corrosion cracking (SCC) and slow strain rate testing (SSRT) equipment
ECC/LE3	Rotating electrode (RDE) electrochemical system
ECC/LE4	Condensing corrosion test system
ECC/LE5	Potentiostat/galvanostat
ECC/LE6	3D profiling microscope
ECC/LE7	Ultra-high permeation liquid chromatograph with mass spectrometer (UHPLC-MS), mass spectrometer (MS), triple time-of-flight (TOF) analyzer
ECC/LE8	Real-time polymerase chain reaction (PCR) cyclers
ECC/LE9	Next generation sequencer (MiSeq)

SERVICE PLATFORM 2: 360 VISUALIZATION

3D IMAGING

SR#	Lab Equipment
3D/LE1	Coupled CT-scanning and core flooding system
3D/LE2	Micro-CT scanner

2D IMAGING

SR#	Lab Equipment
2D/LE1	Gamma-ray attenuation and scanning core flood rig
2D/LE2	Linear x-ray ray scanning (LXRS) core flooding system

MICROSCOPY

SR#	Lab Equipment
MY/LE1	Confocal Raman microscope
MY/LE2	Scanning electron microscope with energy dispersive spectroscopy (SEM-EDS)
MY/LE3	X-ray diffractometer (XRD)
MY/LE3	Transmission electron microscope (TEM)

SERVICE PLATFORM 3: QUALITY ASSURANCE

DRILLING FLUID

SR#	Lab Equipment
DF/LE1	High-Pressure-High-Temperature (HPHT) filter press
DF/LE2	Benchtop conductivity meter
DF/LE3	Brine crystallization kit
DF/LE4	Brookfield viscometer
DF/LE5	Carbolite ashing furnace
DF/LE6	Eppendorf centrifuge
DF/LE7	Differential sticking apparatus
DF/LE8	Benchtop density meter
DF/LE9	Electrical stability tester
DF/LE10	Gas stereopycnometer
DF/LE11	Helium density analysis module
DF/LE12	HPHT filter press
DF/LE13	LPLT filter press manifold
DF/LE14	Lubricity/EP tester
DF/LE15	Particle size analyzer
DF/LE16	Moisture analyzer, infrared with ceramic heating element
DF/LE17	Mud balance
DF/LE18	Pressurized Mud balance
DF/LE19	Permeability plugging apparatus
DF/LE20	Integrated pH meter and automatic titrator
DF/LE21	pH meter
DF/LE22	Portable density meter
DF/LE23	Resistivity meter

SR#	Lab Equipment
DF/LE24	Retort kit
DF/LE25	Roller oven
DF/LE26	Pressurized sag cup
DF/LE27	Sieve shaker
DF/LE28	Spectrophotometer
DF/LE29	Static oven
DF/LE30	Turbidimeter
DF/LE31	Viscometer
DF/LE32	Digital burette

CEMENTING FLUIDS

SR#	Lab Equipment
CF/LE1	Atmospheric consistometer
CF/LE2	Cement hydration analyzer (CHA)
CF/LE3	Constant speed mixer
CF/LE4	Curing chamber, double cell (8 cubes)
CF/LE5	Curing chamber, single cell (16 cubes)
CF/LE6	Digital compressive strength tester
CF/LE7	Expansion mold
CF/LE8	Gas pycnometer
CF/LE9	HPHT consistometer, dual cell
CF/LE10	Sedimentation cell
CF/LE11	Static gel strength analyzer, rotating type
CF/LE12	Static fluid loss tester
CF/LE13	Ultrasonic cement analyzer (UCA), twin cell
CF/LE14	Ultrasonic cement analyzer (UCA), HPHT
CF/LE15	Viscometer
CF/LE16	Wettability tester

STIMULATION FLUIDS

SR#	Lab Equipment
SF/LE1	Acid corrosion tester

PRODUCTION CHEMISTRY

SR#	Lab Equipment
PCY/LE1	Inductively coupled plasma optical emission spectroscopy (ICP-OES)
PCY/LE2	Ion chromatograph
PCY/LE3	X-ray diffraction (XRD)

SR#	Lab Equipment
PCY/LE4	Titration with dosing unit
PCY/LE5	Digital density meter
PCY/LE6	pH/conductivity meter
PCY/LE7	Spectrophotometer
PCY/LE8	Centrifuge
PCY/LE9	Salt-in-crude analyzer

PRODUCTION CHEMICALS

SR#	Lab Equipment
PCL/LE1	Colorimeter
PCL/LE2	Integrated colorimeter
PCL/LE3	Density meter
PCL/LE4	Fourier-Transform Infrared Spectroscopy (FT-IR)
PCL/LE5	Coulometer
PCL/LE6	Mini-flash point tester
PCL/LE7	Flash point tester
PCL/LE8	Moisture analyzer
PCL/LE9	Viscometer

SERVICE PLATFORM 4: CENTRAL FACILITIES

CENTRAL FACILITIES

SR#	Lab Equipment
CW/LE1	Center lathe
CW/LE2	Milling machine
CW/LE3	Drill press
CW/LE4	Horizontal band saw
CW/LE5	Vertical band saw
CW/LE6	Belt/grinding wheel sander
CW/LE7	Welding machine
CW/LE8	3D Printer
CW/LE9	Computer numerical control (CNC) machine

Helpdesk support

We invite you to connect with us to discuss how we might cooperate with you and we look forward to working with you.

For more information, please contact: ADRIC@ADNOC.AE

**ADNOC Research
and Innovation Center**

Service Catalog

