CUTTING EDGE SERVICES

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Investor Days, 26-27 October 2017

WHEN YOU NEED TO BE SURE

CUTTING EDGE SERVICES

OGC & Minerals

INTRODUCTION

- Traditional segments of both OGC and Minerals has been and will continue to be the pillars of these business lines
  - Trade and inspection services
  - Laboratory services

- Simultaneously there is a strategic drive towards creating/enhancing and implementing new initiatives focusing on higher value services at early stages of life-cycles

- A blend of technical expertise and innovative tools

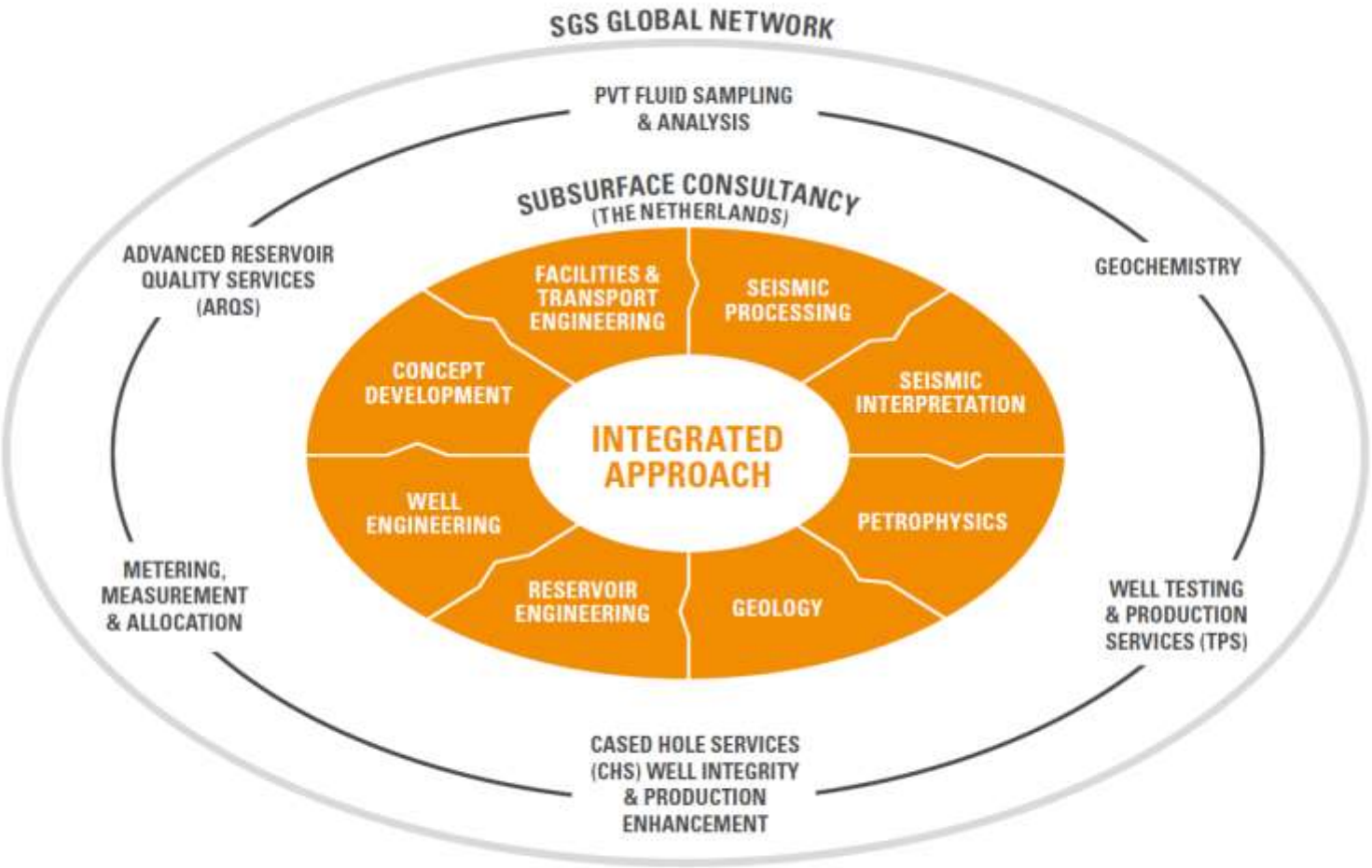
SUBSURFACE CONSULTANCY

ALIM SAIDOV,
EVP OIL, GAS
& CHEMICALS

INCEPTION

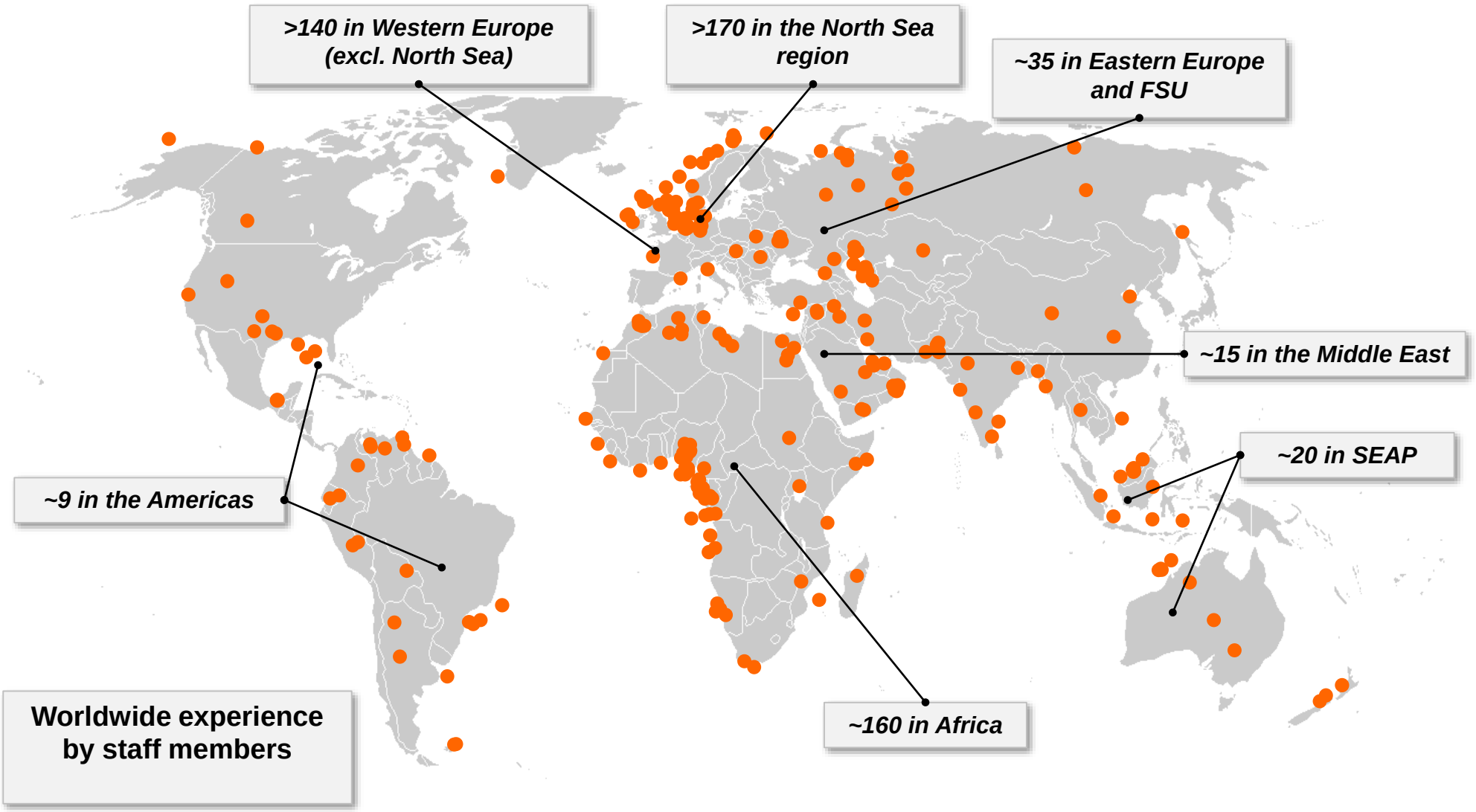
- Founded in 2001 as Horizon Energy Partners and Acquired by SGS Group in 2008
- Head Office near The Hague, The Netherlands
- Technical Staff
  - 35 Full Time Professionals
  - 30 Permanent and on-call Associates
  - Several Associated Companies
    - Z-Terra (USA): Seismic Processing & Imaging
    - CurisTec (France): Geomechanics
    - Sirius Exploration Geochemistry (USA): Basin Modelling
- Extensive track record and broad geographical experience (>700 projects globally)

OGC UPSTREAM
INTEGRATED APPROACH
SUBSURFACE CONSULTANCY



TRACK RECORD & EXPERTISE

>600 projects worldwide since 2001



Worldwide experience by staff members

EXPERTISE - FOCUS AREAS

- Asset Acquisitions / Divestments
  - Opportunity screening
  - Reserves certification, audits and competent person reports
  - Acquisition support (data room to economics)

- Development and Production Studies
  - Quantitative seismic interpretation
  - Exploration and basin modeling
  - Static and dynamic modeling
  - Production optimization / stimulation and flow assurance studies
  - Reservoir management, field development plan and review
  - Operational Support / Drilling & Completion Engineering

EXPERTISE - FOCUS AREAS

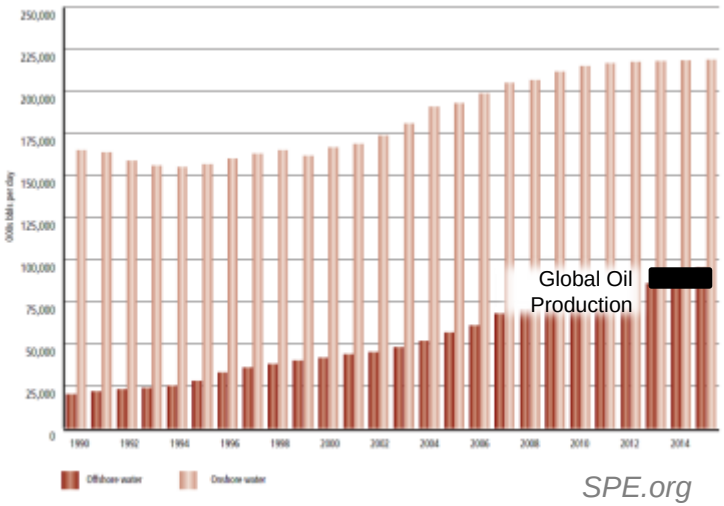
- Unitization, Redetermination and Techno-Legal Services
  - Expert Decision
  - Strategic and technical advice
  - Expert Witness
  - Government and Regulatory Support
- Innovation and Special Studies
  - Developing innovative SGS sampling, analysis and interpretation workflows
  - Low permeability, tight gas and unconventional reservoir studies
  - Geophysical processing, imaging, inversion and monitoring studies
  - Reservoir compaction and subsidence modelling

OPERATOR CHALLENGES WITH H2S

- An upward trend in water production is expected due to ageing fields, focus on greater recovery, development of marginal fields
  - Water production drives microbial induced corrosion
  - (Re-)injection of water may cause (reservoir) souring
- The presence of water is key for microbial life, and, immediately, generation of H2S
- Therefore, related production challenges issues are expected to increase

- 60% of all corrosion related failures in the US are (most likely) caused by bacteria – large economic impact

Global Water Production from Oil Fields



At present, water production volume is greater than oil production volume from offshore fields

GEOSTAT

DERICK GOVENDER,
EVP MINERALS

WHO IS SGS GEOSTAT?

- SGS Geostat is an independent geological and mining consultancy team that has been operating for over 35 years providing the mining industry for most part of its mandate with computer-assisted mineral resource estimation services using cutting edge geostatistical techniques
- This team is known globally as an expert in 3D mineral resource geological modeling and mineral reserve estimation
- SGS Geostat brings the disciplines of geology, geostatistics, and mining engineering together to provide you with accurate and timely mineral project evaluation solutions.

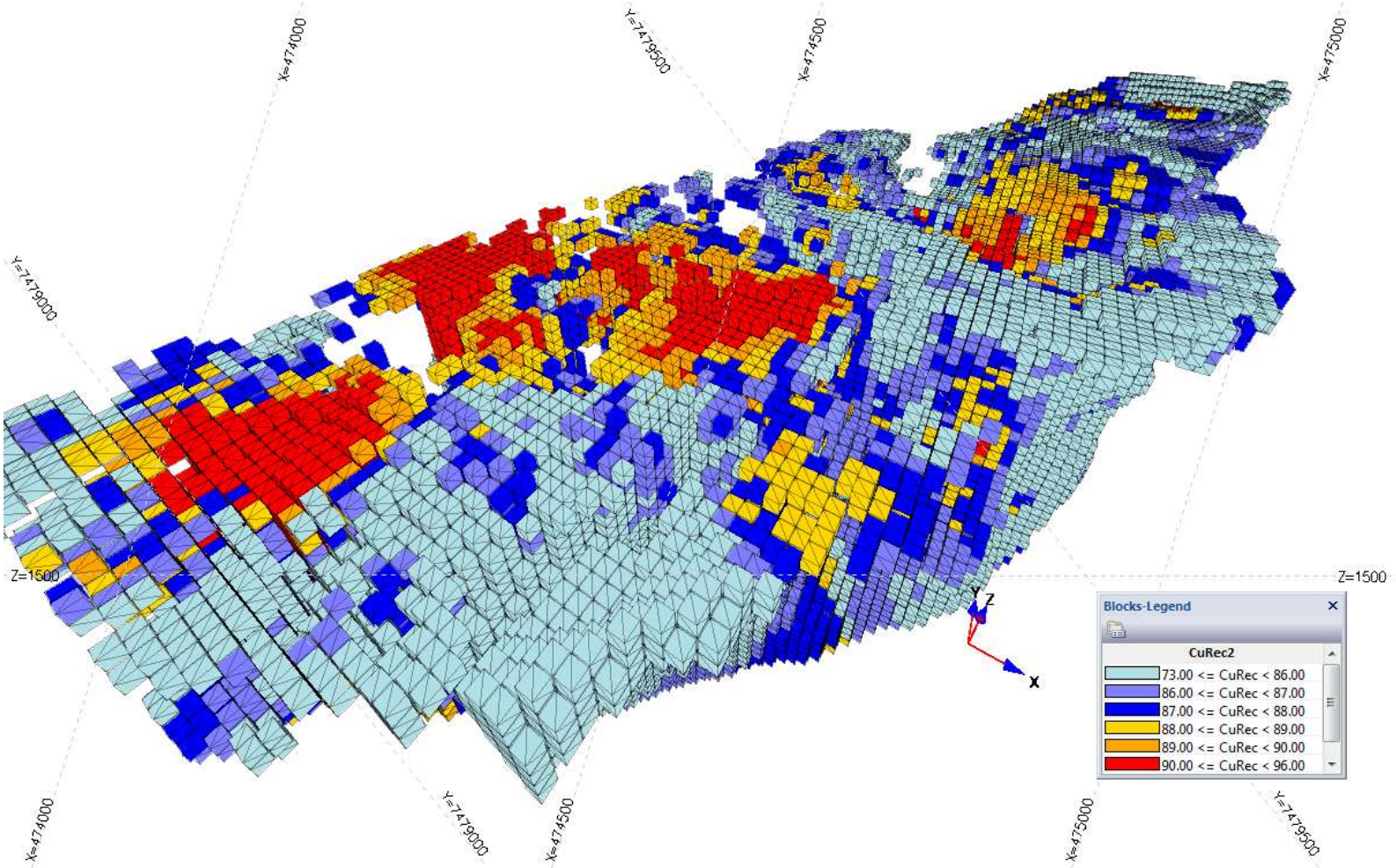
SERVICES

- Comprises specialists in the following areas:
  - Exploration services including customizable software solutions, database management services
  - Geological 3D modeling and mineral resource estimation capabilities within our own in-house GENESIS® software
  - Mining engineering including pit optimization, design and scheduling
  - Mine audits including mineral resources, mineral reserves, mine to plant reconciliation and technical due diligence
  - Training and education

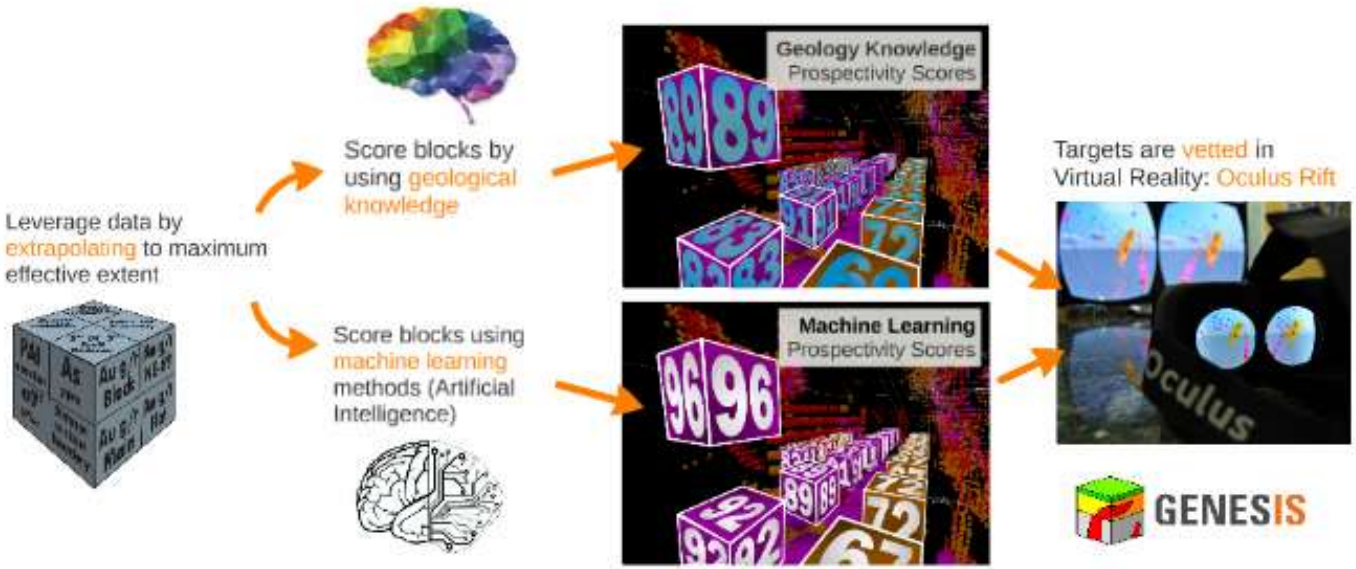
WHERE IS THE FUTURE GROWTH?

- GENESIS AND MACHINE LEARNING
  - Growth in digitizing hardcopy geoscientific data, database architecture creation for running the Machine Learning software
  - Most companies don’t have the manpower to do this type of work
  - Can provide a new source of revenue and length of each job dependent on amount of data, status of client’s database, etc.
  - Once a Machine Learning database is created, SGS Geostat carries out regular database updates

BIG DATA IMAGE



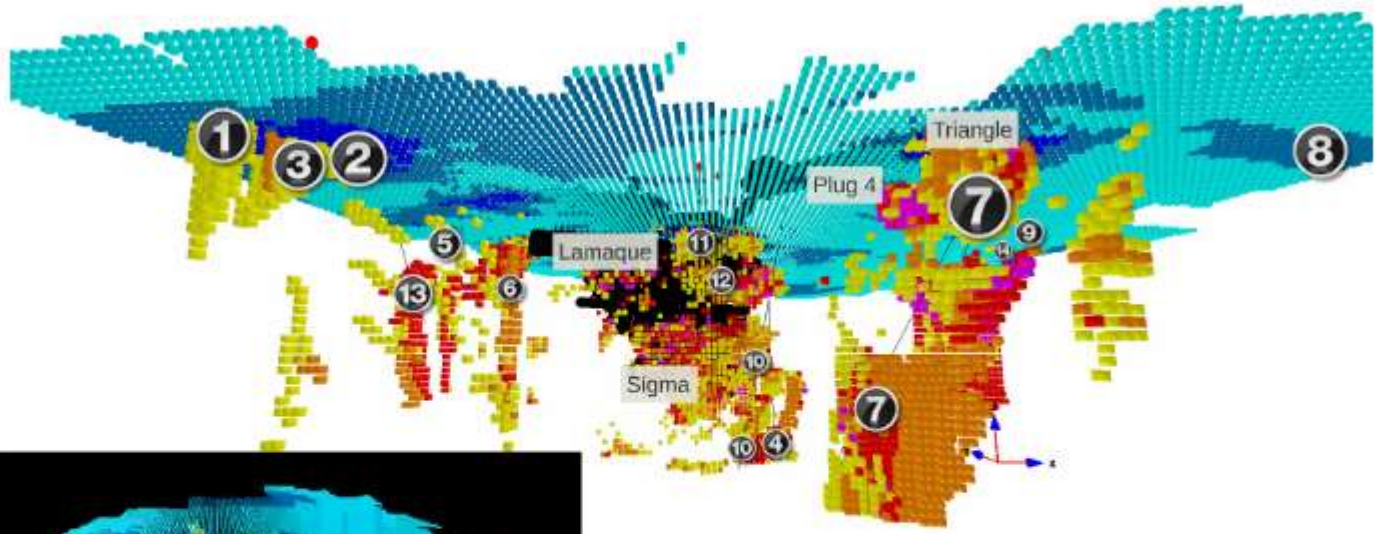
SWITCH ON THE MACHINES!

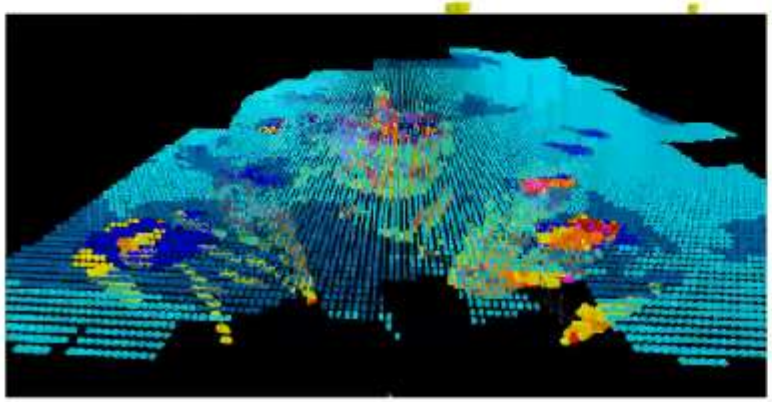


SGS Geostat Strategy

- Living breathing model that can be updated
- Unbiased platform for planning and risk reduction

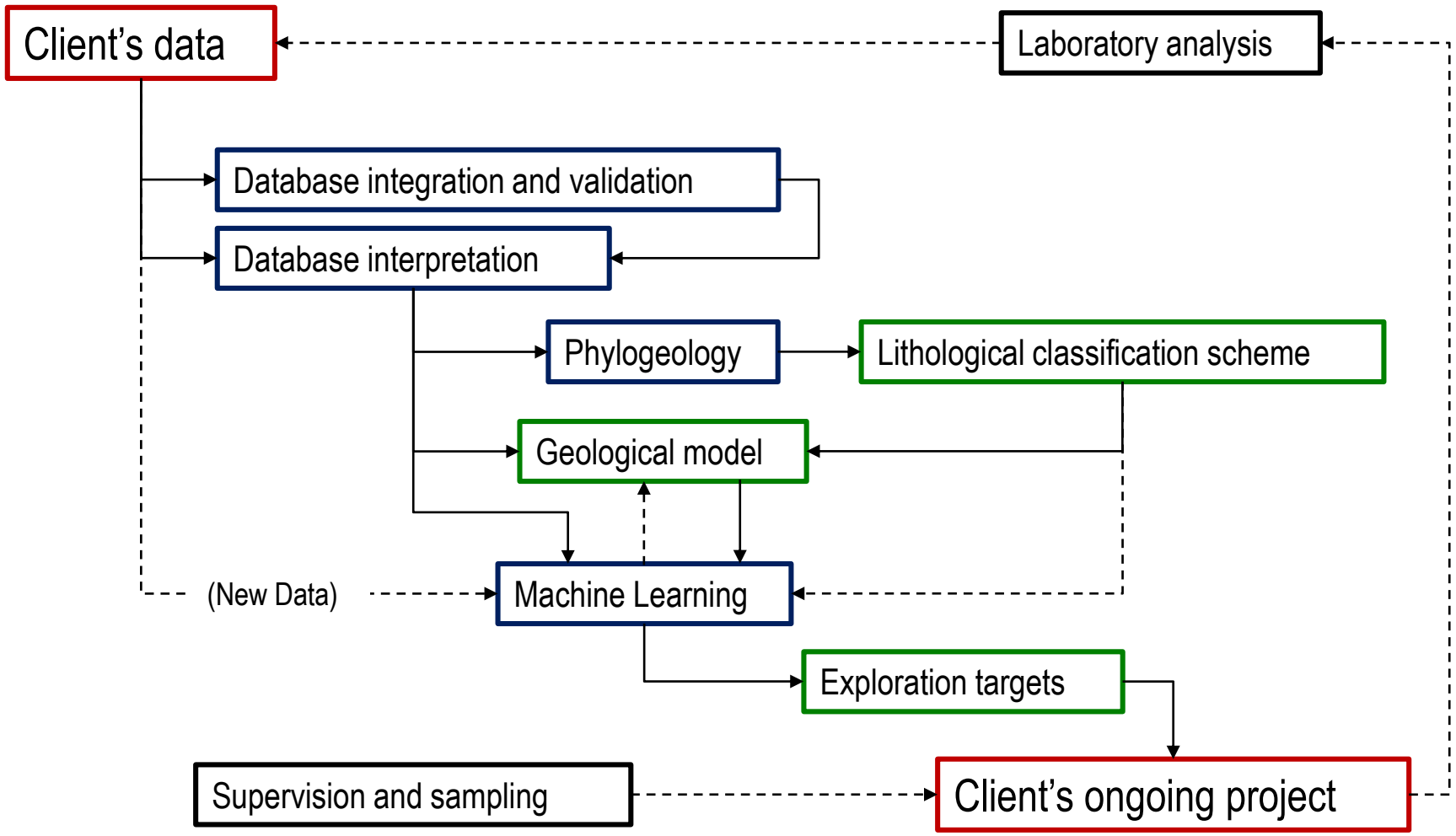
RESULTS





More gold with less drilling

MODELLING AND TARGETING



HOW CAN GEOSTAT COMPLIMENT CURRENT SGS MINERALS SERVICES FOR GLOBAL OPPORTUNITIES?

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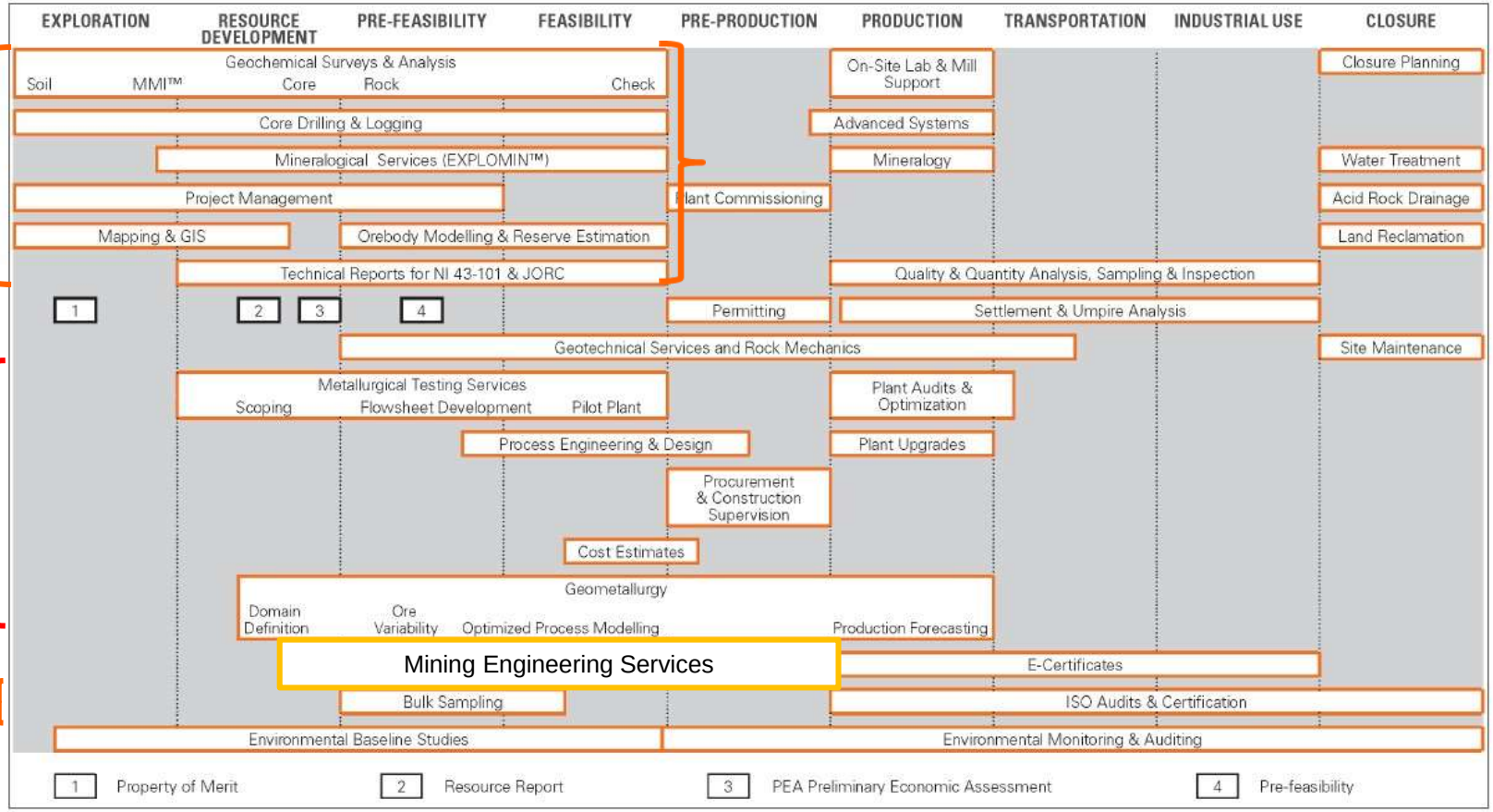
MINERALS ACCESS SHEET

Geostat

Geostat + various SGS divisions

Geostat + SGS Bateman



SUMMARY

- Maintain the traditional business while exploring the new and innovative service options
- Provide cutting edge innovative solutions that go beyond our core services
- Add value to our customers to help them respond to tomorrow's energy needs
- Through analytics and technology, strengthen our leadership position

ENGAGING THE CUTTING EDGE SERVICES FOR OGC & MINERALS ADDS UP

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WHEN YOU NEED TO BE SURE

SGS