



Project 3.2: Lab-at-Rig® Futures



PROGRAM 3: TARGETING

Program Leader	David Giles (University of Adelaide)
Project 3.2	Lab-at-Rig® Futures
Project Leader	Yulia Uvarova (CSIRO)
Key Researchers	Aaron Baensch (Olympus), Dave Lawie (Imdex), Michelle Carey (Imdex), James Cleverley (Reflex), Caroline Forbes (University of Adelaide)
Participants	CSIRO, Curtin University, Imdex, Olympus, University of Adelaide
Timing	1 February 2014 – 1 February 2018
Cash Funding	\$3,200,000
In Kind Funding	\$6,870,000
Review Panel Chair	Tony Belperio (Minotaur Exploration)

“This project will lay the foundations of future Lab-at-Rig® platforms that will see the technology applied to new drilling technology, take advantage of new sensor technologies and develop the application beyond current deployment in Greenfields exploration.” James Cleverley, Reflex

OBJECTIVES

Project 3.2 Lab-at-Rig® is a key component of the DET CRC Lab-at-Rig® research strategy. In Project 3.2 we will provide (1) the underpinning research needed to develop the next generation Lab-at-Rig® system, (2) research, testing and deployment of new sensor technologies as well as the novel application of existing analytical technology, (3) design of advanced algorithms for data processing and decision making and (4) a technical prototype of the Lab-at-Rig® system for Coiled Tube Drilling which is under development in Project 1.1. We will also characterise the interactions between geologic materials and the drilling, sampling and analytical components of the combined CT rig/Lab-at-Rig® system and allow conversion of Lab-at-Rig® data to geological knowledge needed in the application to the minerals sector.

BACKGROUND AND AIMS

Project 3.2 “Lab-at-Rig® Futures” includes the following sub-modules

- Future Sensors: Roadmap, Development and Deployment.** This module is focused on other sensor systems and their potential use in powder characterisation for geological applications.
- Assessing, Testing and Deploying Laser Induced Breakdown Spectroscopy (LIBS) for light elements** as a potential next generation sensor in the Lab-at-Rig® system.
- Advanced Level ‘O’ Algorithms for LAR Sensors** building on pre-existing expertise to improve the application of the modelling of x-ray data.
- Data to Knowledge** (link to Project 2.3, and application of the ReflexHUB) will deliver the research that turns data into knowledge supporting decision making.
- Towards Lab-at-Rig®-Fluids.** This research will be carried out in collaboration with Program 1 projects and provides the fundamental research that will support design of Lab-at-Rig® for this future drilling platform.
- Proof-Of-Concept & Engineering the Lab-at-Rig®-CT** will provide the technical planning for the engineering modification and underpinning science for Lab-at-Rig® to work with the Coiled-tubing drilling system.

SERVICE SECTOR ENGAGEMENT AND COMMERCIALISATION

Project 3.2 Lab-at-Rig® is an embedded partnership between the research and service providers of the DET CRC and the project will take advantage of the close links between the ongoing Lab-at-Rig® commercial activity and the research path defined by the 3 pillars. This project aims to deliver a pipeline of commercial outcomes into Lab-at-Rig® technology.

LINKAGES TO OTHER DET CRC PROJECTS

This project will link closely with the research of Program 1 in the development of the CT Drilling System as we look to the future deployment of Lab-at-Rig® into this new drilling application. We will also work closely with cuttings transport and drilling mud research as we seek to improve the optimization of Lab-at-Rig® going forward.

YEAR 2 MILESTONES

- Technical prototype delivered for Lab-at-Rig® v.2 including LIBS for light elements (Module 1).
- Completed study of drilling fluid-rock powders interaction and finalised in the report (Module 5).
- Demonstration of rapid determination of gold in drilling fluids from a range of technological solutions (Module 5).
- Provide quantitative measures characterising the solid and fluid products and rock cutting conditions expected during CT-Drilling and recommendations on how these measures inform quality control and the development of a Lab-at-Rig® system for coiled tube drilling (Module 6).
- First version of proof-of-concept delivered for the adaptation of Lab-at-Rig® to CT drilling based on the technical outcomes of the characterisation work and project 1.1 (Module 7).

COMMONWEALTH AGREEMENT OUTPUT AND MILESTONES

- 3.2.3 (30 June 2014) Training programs for geoscience professionals developed. At least 2 PhD candidates commenced.
- 3.2.4 (30 June 2015) New tools for sampling hypogene halos that are cost-competitive with current methods developed.
- U3.2.2 (30 June 2015) First usage with new sampling tools occurs.
- 3.3.3 (30 June 2016) Development of training programs for geoscience professionals completed.
- U3.2.4 (30 June 2017) Hypogene protocols used in majority of relevant exploration programs by sponsor end user companies. Usage grows on an annual basis.