



Gold Hydrogen

**Committed to developing naturally
occurring Hydrogen and Helium in
Australia**

**The Gold Standard
in Green Energy**

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Prospective Resource Statements

The Prospective Resource Statements for Natural Hydrogen and for Helium have been included in presentation under the approval of Mr Billy Hadi Subrata, Chief Engineer for Gold Hydrogen, who is a Qualified Petroleum Reserves and Resources Evaluator. Mr Hadi Subrata confirms that, as at the date of this announcement, there is no change to information or additional information, since the effective dates, that would materially change the estimates of prospective resources quoted.

QPRRE Statement – Natural Hydrogen

The Prospective Resource Statement for Natural Hydrogen in this presentation is based on, and fairly represents, information and supporting documentation prepared by independent consultants "Teof Rodrigues & Associates" with an effective date of 30 September 2021, and which forms part of the Company's Replacement Prospectus dated 29 November 2022. The Prospective Resource Statement, together with all relevant notes, also appears in the Company's ASX release of [13 January 2023](#).

QPRRE Statement - Helium

The Prospective Resource Statement for Helium in this announcement is based on, and fairly represents, information and supporting documentation prepared by independent consultants "Teof Rodrigues & Associates" with an effective date of [21 February 2024](#), and which was announced by the Company on that date together with the accompanying assumptions and notes.

Investor Snapshot

Current Capital Structure

Total shares on issue	159.7m
Shares escrowed (to Jan 25)	83.0m
Free-float	76.7m
Options on issue (75c / \$1.00 / \$1.75)	5.1m
Fully-diluted capital	164.8m
Market cap at \$1.60 / share	\$255m
Cash on hand	\$16m

12 Month Share Price Performance

GHY ASX Chart



Executive Summary – Natural Hydrogen and Helium



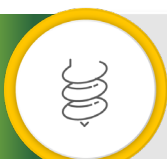
Certified title over natural hydrogen and helium resources with exploration upside.

Certified prospective resource: **1.3 billion kg of natural hydrogen (unrisked Best Estimate)** and **41 Bcf of helium (unrisked Best Estimate)** with a mean of **96 Bcf**. (Refer Slide 13 for further detail)



Flagship ‘Ramsay Project’, exploration permit granted, plus application permits

Ramsay Project 7,820 km² (green on map) is 100% owned by Gold Hydrogen. Other locations under exclusive application to Gold Hydrogen are a further 67,512 km²



Ramsay 1 and Ramsay 2 exploration well results indicate Hydrogen and Helium

Preliminary gas sample analyses have yielded high purity levels of up to **95.8% hydrogen (air-corrected)**, plus **helium** in high purity levels at **up to 17.5% (air-corrected)**. Refer ASX release of 27 May 2024 for full details.



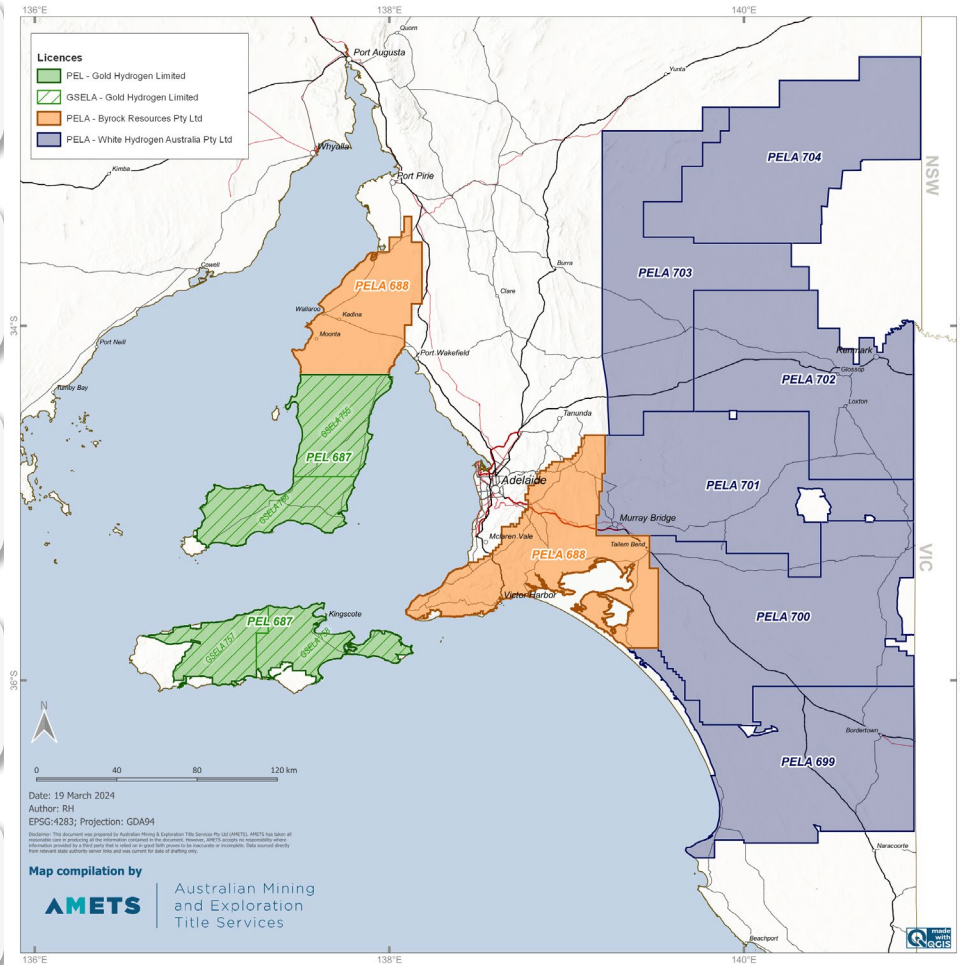
Enabling engagements with leading global hydrogen experts and contractors

Strategic engagements to date with CSIRO, Schlumberger, Total Seismic, Xcalibur, Savanna Energy Services



Significant commercial and environmental competitive advantage

Naturally occurring hydrogen provides cost and emission advantages over other production sources. Global helium projects can be commercially viable even at 1% purity, given helium's rarity and value

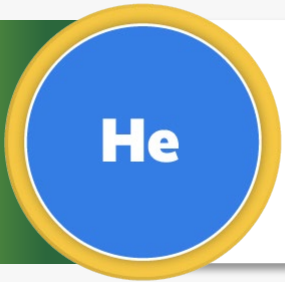


Hydrogen and Helium to date in PEL687

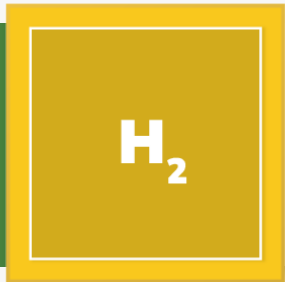
Extensive findings across 7,400 km² permit area



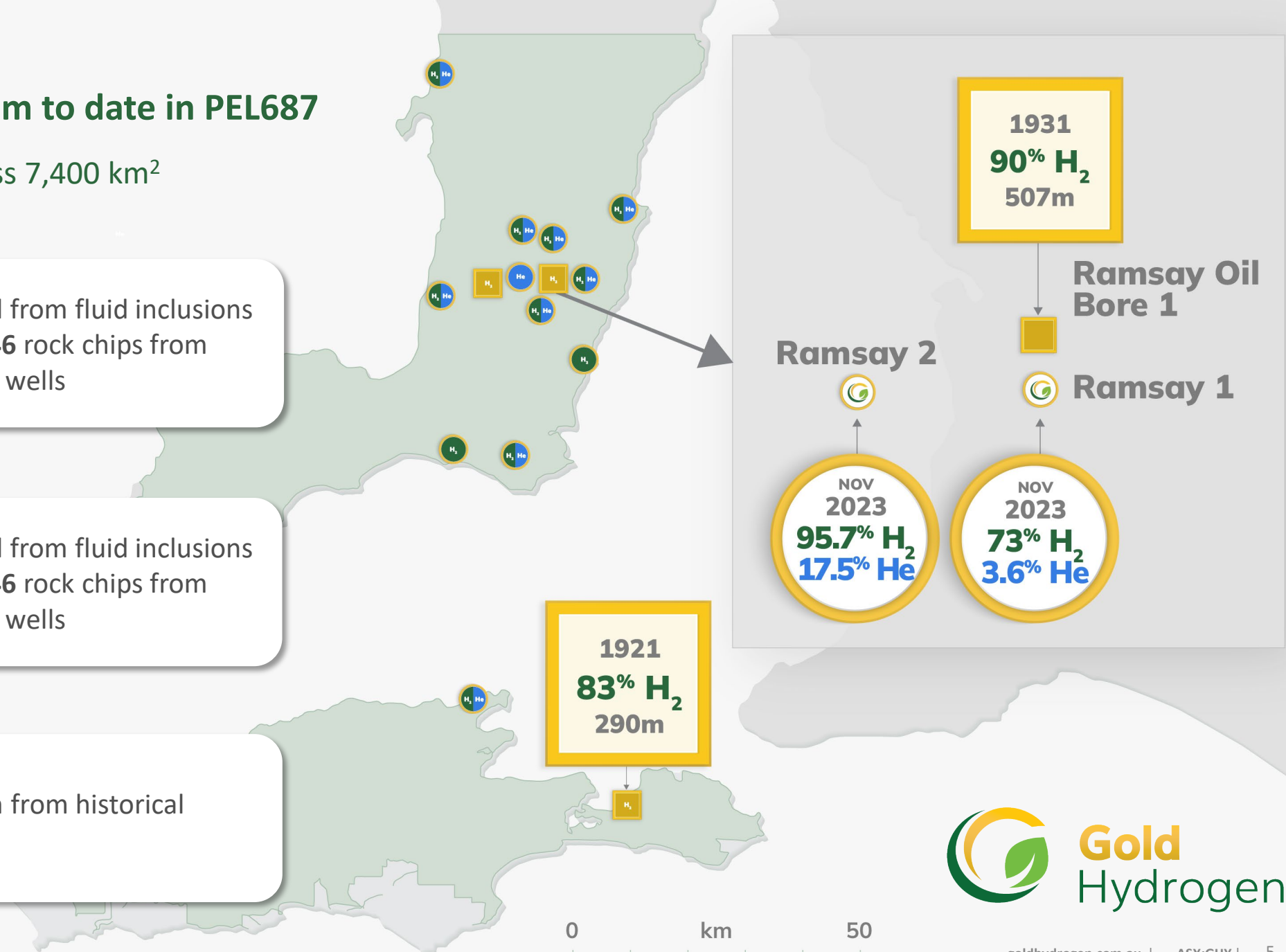
Extracted from fluid inclusions in **35 of 46** rock chips from historical wells



Extracted from fluid inclusions in **29 of 46** rock chips from historical wells



Hydrogen from historical wells



Note: Ramsay 1 & 2 purity results are air-corrected





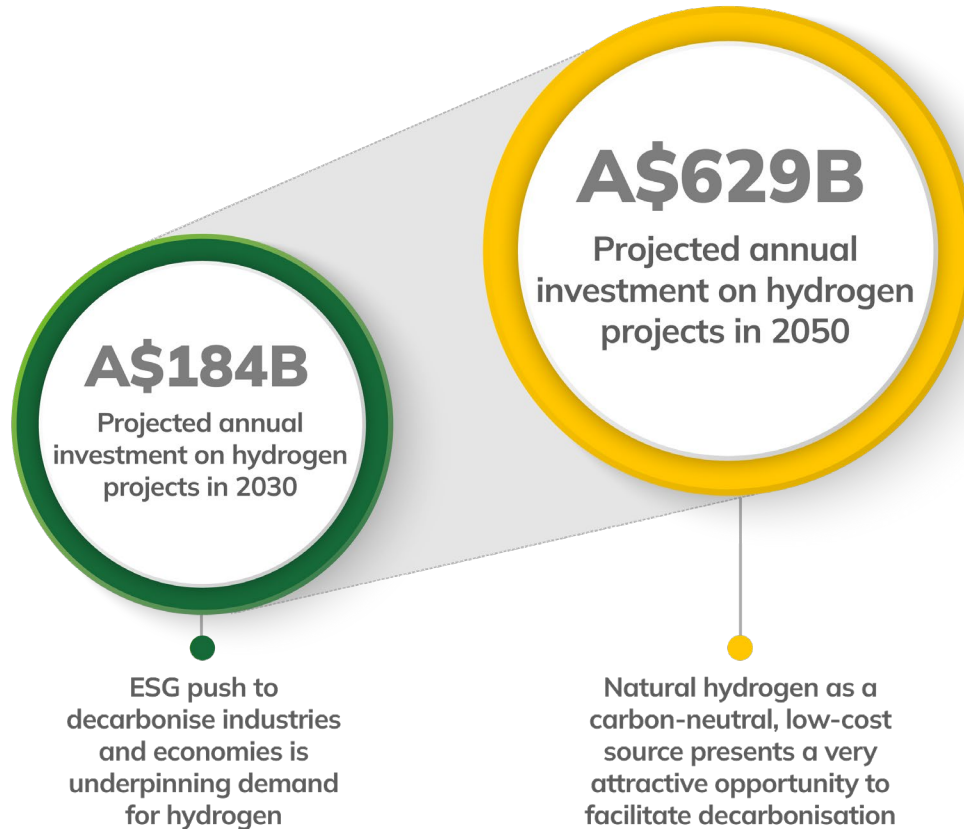
Industry Overview



Gold
Hydrogen

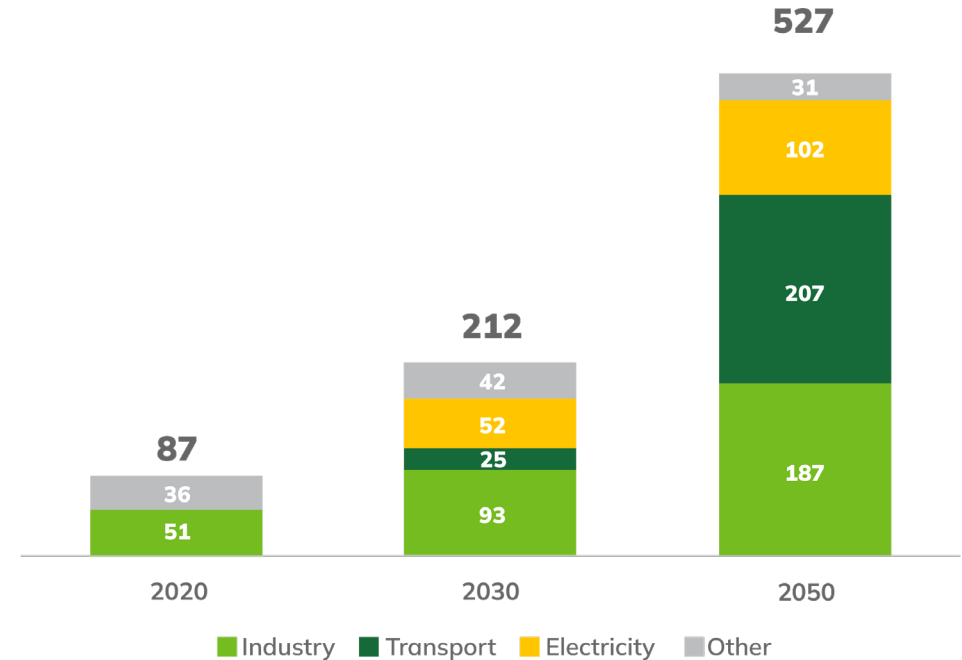
Global Hydrogen Forecast

Substantial investment laying the foundation for Hydrogen use



Source: Frost & Sullivan Report - Page 29 of Gold Hydrogen Prospectus

Global Hydrogen Demand by Sector, Net Zero Emissions Target Scenario (Mt)



Source: International Energy Agency, Oct-2021 1. Other includes buildings, agriculture and refineries

Key Trends

Driving Hydrogen Adoption

Hydrogen today is used in ammonia production, steel manufacturing, and oil refineries, with future growth driven by key adoption trends.



Driving Helium Adoption

Helium today is used in the health, electronics, and space industries, with future growth projections based on key technological advancements.



Types of Hydrogen Production

Naturally occurring Hydrogen offers significant cost and / or carbon advantages relative to other Hydrogen production (manufacturing) processes

Gold Hydrogen is exploring for 'gold' or 'white' (natural) Hydrogen

Gold / White
(natural)

Grey

Black/Brown

Blue

Green

Energy source	Natural hydrogen	Natural gas	Coal	Natural gas / coal	Renewables / biomass
Environmental impact	Low	High	Very High	Low	Low
No thermal process	✓	✗	✗	✗	✗
Production cost (A\$/kg) ^{1,2}	\$1.00	\$5.60	\$6.20-\$6.40	\$10.20-\$10.30	P: \$6.40-\$25.50 A: \$4.70-\$23.20
Cost comparable to existing power generation ³	✓	✗	✗	✗	✗

Source: Frost and Sullivan, Sep-2022 (Refer Gold Hydrogen Replacement Prospectus dated 29 November 2022)

1. Source: Christophe Rigollet¹, Alain Prinzhofer^{2,3}, Natural Hydrogen: A New Source of Carbon-Free and Renewable Energy That Can Compete With Hydrocarbons, First Break, Volume 40, Issue 10, Oct 2022, p. 78 – 84 DOI: <https://doi.org/10.3997/1365-2397.fb2022087>; "The Bourakébougou field, in Mali, represents the first natural hydrogen deposit studied both scientifically and industrially."

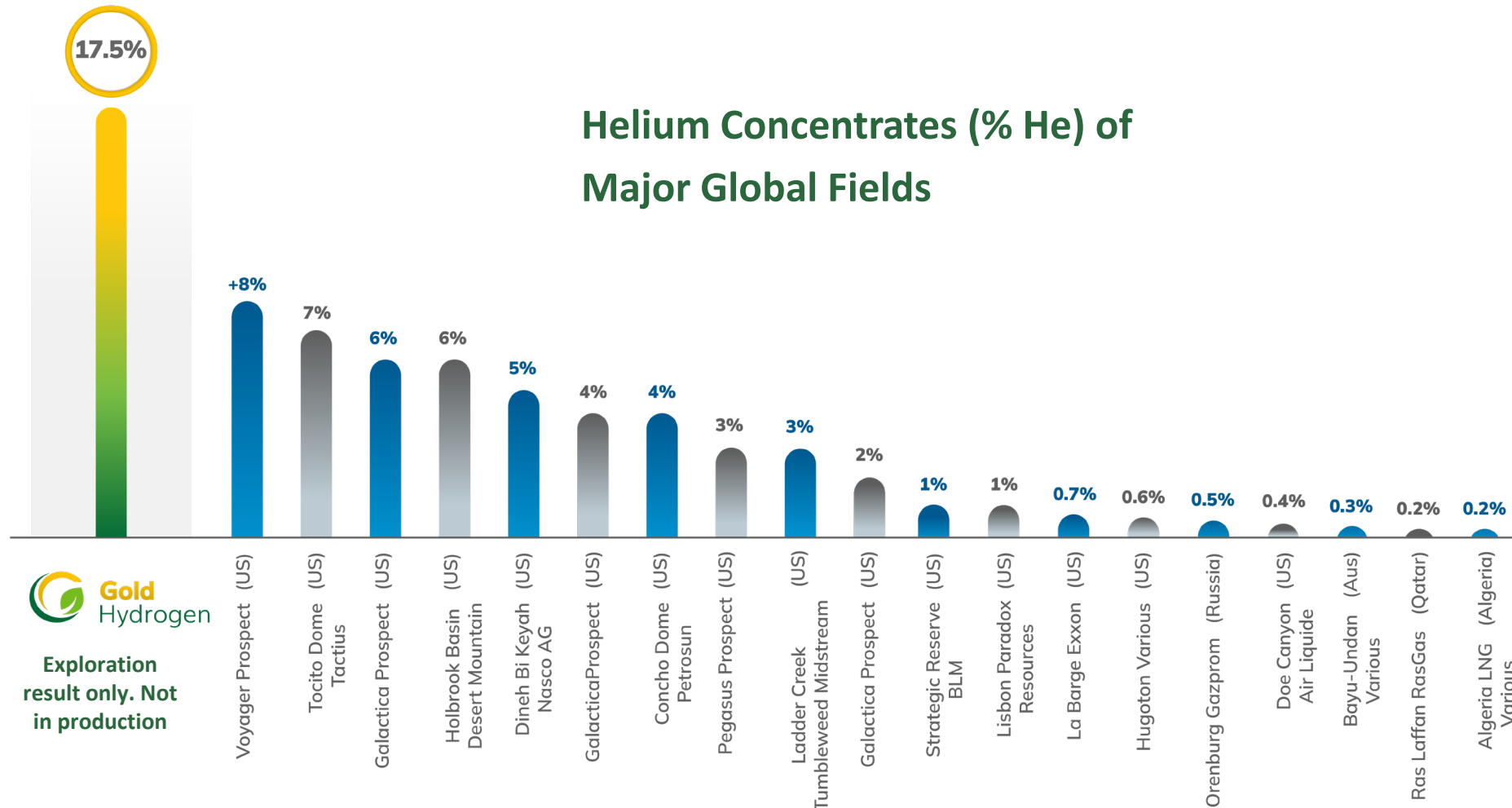
It gives us information on its renewability, on the natural flows involved and therefore on its sustainable exploitation. It is possible to estimate that the cost of operating hydrogen would be less than \$1/kg, which is significantly cheaper than any manufactured hydrogen, whether green, grey, or blue. Equivalent work is in progress in other continents, in order to be able to compare our knowledge of this Malian field with other fields in the world, which will make it possible to better ensure the industrial and societal interest of R&D for this new field."

2. P = Polymer electrolyte membrane electrolysis. A = Alkaline Electrolysis. Gold Hydrogen cost is an estimate

3. For industrial buyers, a hydrogen offtake price of €3 (\$4.50) per kg would be required to incentivise hydrogen production over power generation

Global Helium Projects

Gold Hydrogen's Ramsay 1 & 2 exploration wells sampled Helium at up to 17.5% air-corrected (in addition to the Hydrogen identified). Refer ASX release 27 May 2024.



Indicatively, longer-term bulk pricing is expected to be approximate USD450 per Mcf (thousand cubic feet), as at February 2024 www.noblehelium.com.au quoting Kornbluth Consulting



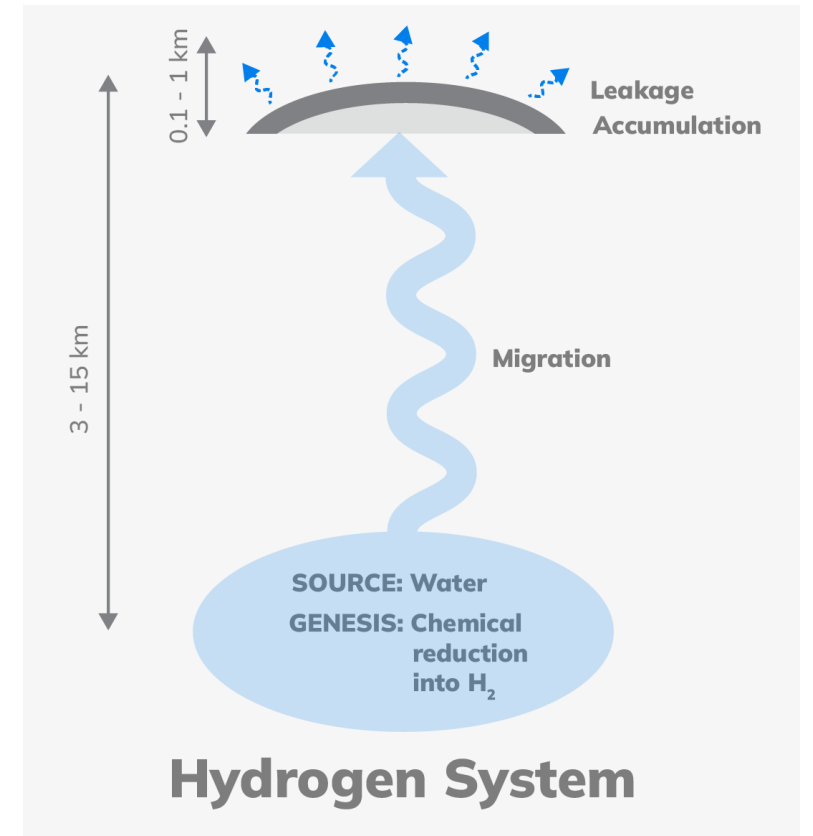
Company Overview



Key Success Factors Exploration – Update post stage 1 well tests

Ramsay Project ticks the boxes in respect of the key attributes for the formation and accumulation of Natural Hydrogen and Helium

Key Success Factor		Results of Exploration Activities Since IPO
Source & Generation	Via hydrolysis and / or radiolysis reactions in old rocks	The presence of Natural Hydrogen at 95.8% purity and Helium at 17.5% purity has been confirmed at the Ramsay Project location via mud gas measurements, MDT samples and stage 1 testing. Results are air-corrected. Refer ASX release of 27 May 2024.
Seals & Traps	Required to enable accumulations of naturally formed hydrogen	The presence of retained Natural Hydrogen and Helium indicates that the stratigraphy includes valid seals and traps at the location of the Ramsay Project.
Structure	Major structural boundaries in an extensional geological regime where natural fractures exist	The airborne gravity and magnetic geophysical survey and the FMI (image log) data from the wells supports the interpretation that the Ramsay Project is located in a structurally favourable position for a large scale Natural Hydrogen and Helium accumulation.
Reservoir	To be commercial, a reservoir of adequate volume, accessibility, flow rate and quality is required	The FMI data from the wells and results of the stage 1 testing has demonstrated that the fractured limestones, dolomites and basement acts as suitable reservoir for accumulating extractable Natural Hydrogen and Helium.



Source: SPE Hydrogen Section, online. November 2, 2023 (Ref: Prinzhofer, 2021)

Gold Hydrogen Prospective Resources (Using PRMS guidelines)

Certified Prospective Hydrogen Resources, existing discoveries and drill ready hydrogen prospects (calculated volume not determined)

Unrisked Prospective Hydrogen Resources, PEL 687			
SPE-PRMS Sub-Class Category	Low Estimate (kTonnes)	Best Estimate (kTonnes)	High Estimate (kTonnes)
Prospect	165	1135	8050
Lead	42	178	770
Total	207	1313	8820

Certified Prospective Helium Resources, Ramsay Field (PEL 687 Yorke Peninsula)

Unrisked Prospective Helium Resources, PEL 687			
SPE-PRMS Sub-Class Category	Low Estimate (Bscf)	Best Estimate (Bscf)	High Estimate (Bscf)
Prospect Ramsay Fault Block	2	8	38
Prospect South of Ramsay Fault Block	5	33	205
Total	7	41	243

See ASX releases of 13 January 2023 (Hydrogen) and 21 February 2024 (Helium) for full details and notes

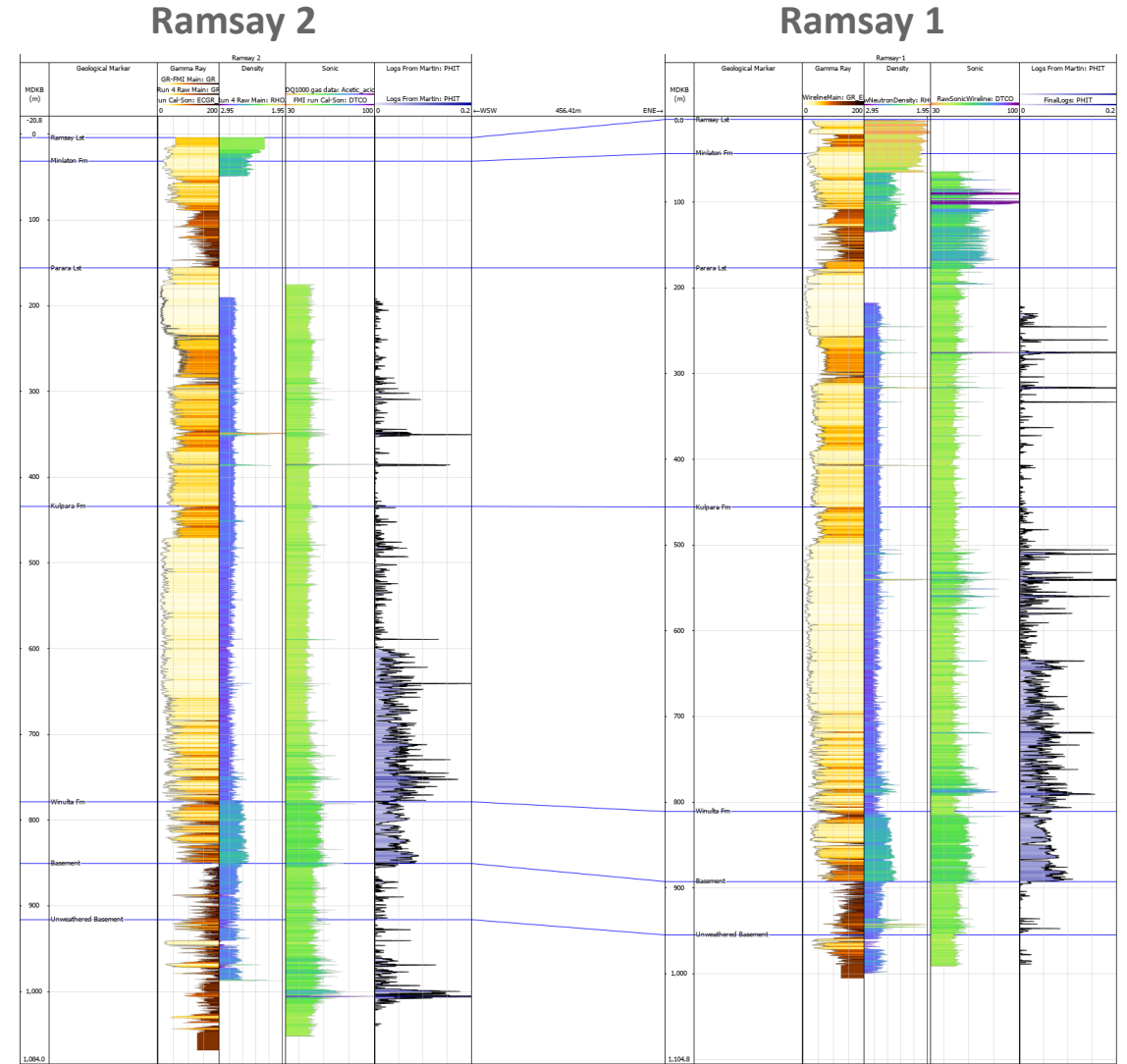
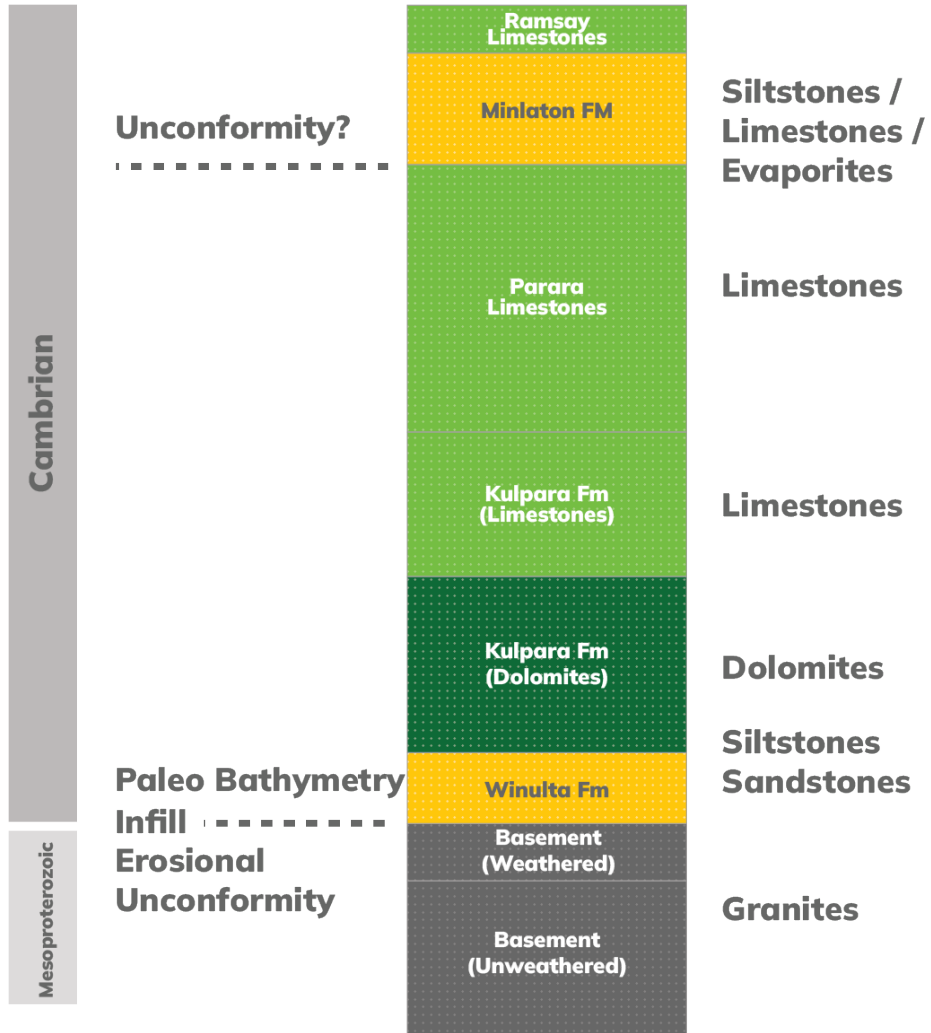
NOTE - All estimates are unrisked and aggregated arithmetically by category, hence caution that the aggregate low estimate maybe a conservative estimate and the aggregate high estimate maybe very optimistic estimate due to the portfolio effects of arithmetic summation. The estimated quantities of hydrogen and / or helium that may potentially be recovered by the application of future development project(s) relate to undiscovered accumulations. These estimates have both an associated risk of discovery (Pg), risk of development (Pd) and risk of commercialization (Pc). Further exploration, appraisal and evaluation is required to determine the existence of a significant quantity of potentially recoverable hydrogen and / or helium.

Ramsay Project Milestone Snapshot

Ramsay Project 2023 – 2025 Objectives

Seismic reprocessing	Q2, 2023	✓ Completed with Total Seismic
Well design & planning	Q2, 2023	✓ Completed with SLB
Airborne survey	Q2, 2023	✓ Completed with Xcalibur
Soil sampling survey	Q3, 2023	✓ Completed with CSIRO
Offset well data study	Q3, 2023	✓ Completed with CSIRO
Permit & approval process	Q3, 2023	✓ Completed with JBS&G, and ongoing
Drilling Australia's first Natural Hydrogen well	Q4, 2023	✓ Drilled R1 and R2 wells
Resource report update	Q1, 2024	✓ Helium Prospective Resource
Exploration well testing program	Q2, 2024	✓ First stage well testing program complete
Regional seismic program	Q2, 2024	✓ Stage 2 scheduled for July
Further exploration wells	Q4, 2024 or Q1, 2025	▽ Scheduling subject to seismic interpretation to optimise locations
Proof of concept pilot plant project	Q4, 2024	Pending: Subject to site selection, permitting, approvals, etc Pending: Subject to well testing results

Ramsay 1 & 2 – Drilling Australia’s First Natural Hydrogen Wells



Well Testing – Objectives



Stage 1 – Exploration well testing ran from March to April 2024

Stage 1 Primary Objective – Obtain gas samples for international analysis.

Achieved

Stage 1 Secondary Objective – Extract gases to surface, including in formation fluid.

Achieved

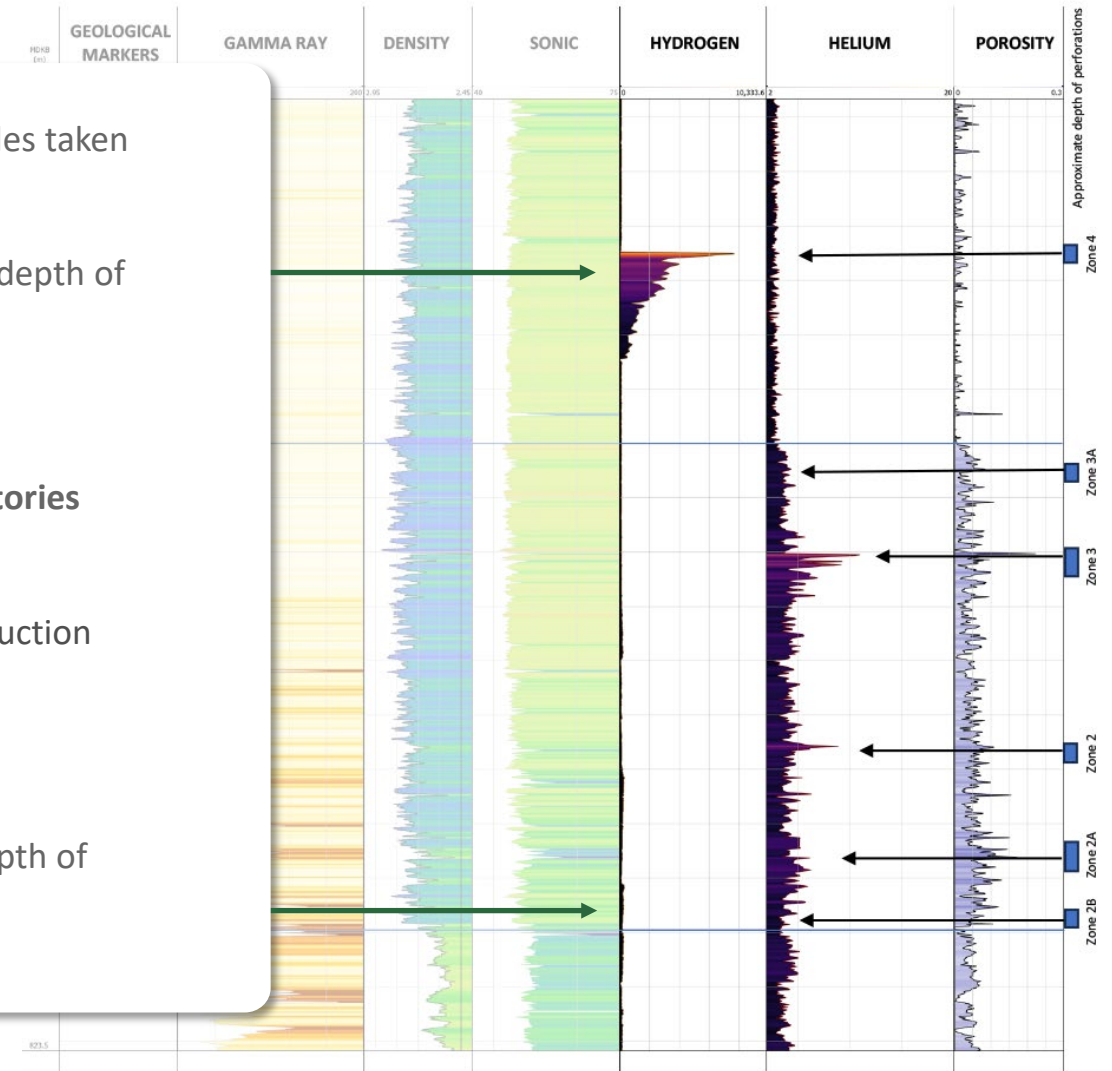
Analyse samples for purity and isotopic composition

Facilitate initial Pilot Project planning:

- Hydrogen to energy
- Helium bottling plant

Well Testing – Stage 1 Interim Results

- Gas successfully flowed to surface, numerous zones identified, and samples taken for analysis
- Air-corrected **hydrogen** result of 95.8% confirmed for Ramsay 2 well at a depth of 531m. Refer ASX release of 27 May 2024 for full details
- Permeability of structures confirmed
- Isotopic results for hydrogen and helium **from specialist overseas laboratories pending**
- Key learnings designed to assist with future well design, drilling and production techniques, and will ultimately assist with pilot plant concept design
- 180m thick **helium** pay zone identified
- Air-corrected **helium** result of 17.5% confirmed for Ramsay 2 well at a depth of 778m. Refer ASX release of 27 May 2024 for full details

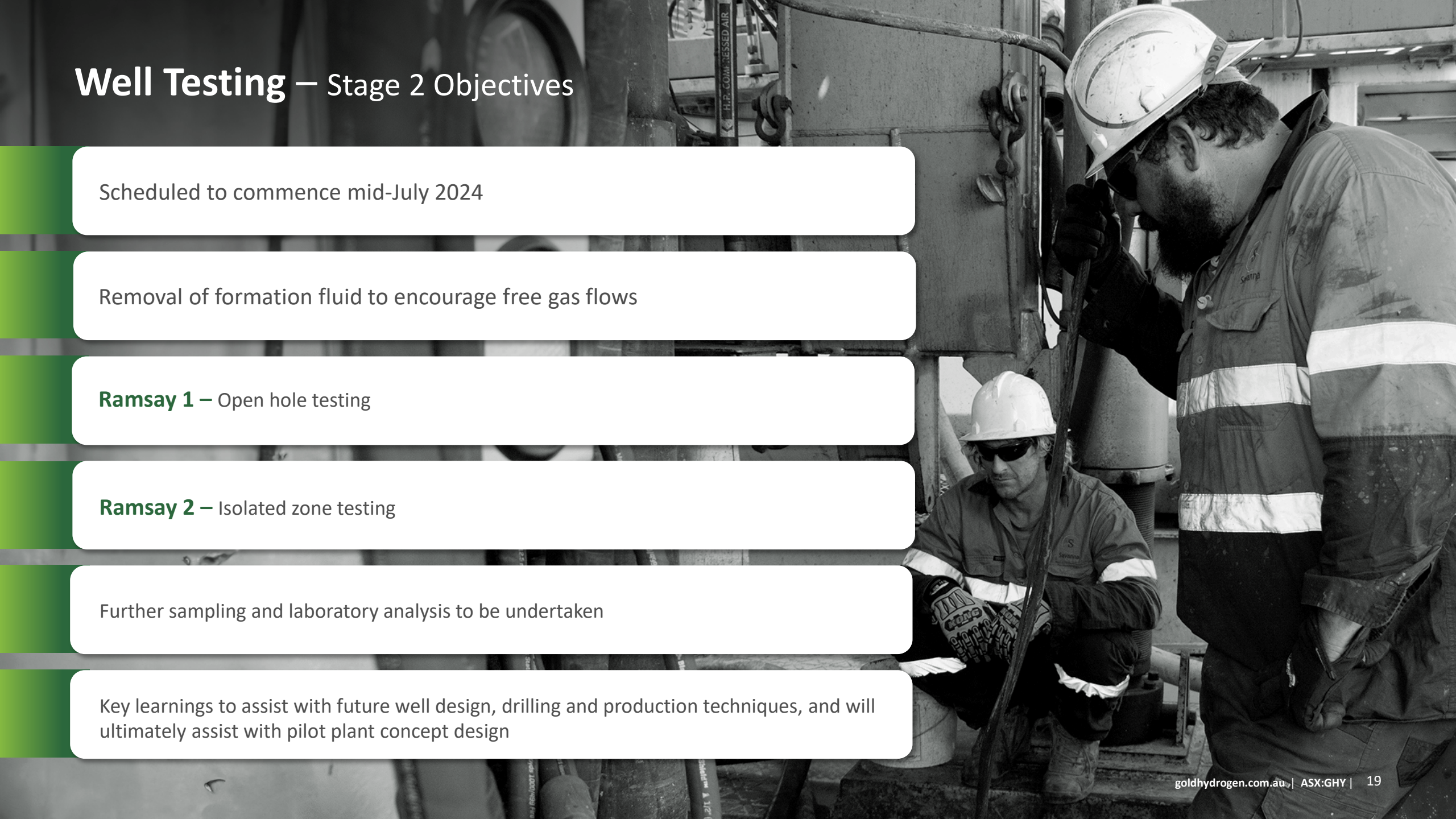


Key Success Factors Appraisal – Work program next steps

Further appraisal activities are focused on establishing the commerciality of the Ramsay Project

Key Success Factor		Results from exploration activities since IPO
Hydrogen Flow Rate and Composition	Establish sustained flow rate to surface of hydrogen and associated gas components	Stage 2 well testing scheduled for July 2024 is designed to allow a sustained flow of hydrogen from the hydrogen-bearing reservoir units to surface and measure the uncontaminated composition of the produced gas.
Size of the Hydrogen and Helium Accumulations	Determine the likely lateral extent of the hydrogen and helium accumulations	The Ramsay 2D seismic survey scheduled to commence late June 2024 is designed to establish the lateral extent of the hydrogen and helium-bearing stratigraphic units and determine the large-scale trapping geometry of the accumulations at the Ramsay Project location.
Helium Extraction Rate	Establish the sustained extraction rate for the helium	Stage 2 well testing is designed to establish a sustained flow of helium and associated fluids from the helium-bearing reservoir to determine the uncontaminated gas composition and the helium extraction rate from the produced products.
Development Sweet Spot	Determine the likely development sweet spot for hydrogen and helium extraction	The next wells to be drilled being planned for Q4 2024 or Q1 2025 are designed to confirm the hydrogen and helium development sweet spots, established from the integration of the Ramsay 2D seismic data and results from the stage 2 testing of Ramsay 1 and Ramsay 2 wells.

Well Testing – Stage 2 Objectives

A black and white photograph of two workers in safety gear at an industrial site. One worker is standing on the right, wearing a white hard hat, safety glasses, and a high-visibility jacket with reflective stripes. He is holding a long, thin rod or tool. The other worker is kneeling on the left, also wearing a white hard hat and safety glasses, and is looking down at something in his hands. The background shows industrial equipment, including pipes and a tank labeled 'H.P. COMPRESSED AIR'.

Scheduled to commence mid-July 2024

Removal of formation fluid to encourage free gas flows

Ramsay 1 – Open hole testing

Ramsay 2 – Isolated zone testing

Further sampling and laboratory analysis to be undertaken

Key learnings to assist with future well design, drilling and production techniques, and will ultimately assist with pilot plant concept design



Key Team



Key Management



Neil McDonald

Founder & Managing Director

Neil McDonald, with over 20 years of experience in the energy and minerals sectors across Australia, has worked on major exploration projects from greenfield to early development. He is a graduate of the Australian Institute of Company Directors.



Roger Cressey

Director - Commercial & Operations

Roger Cressey has over 35 years of experience in the resource industry, mainly in gas exploration and production. He has held CEO, COO, and other executive roles in Australia (Queensland and NT), PNG, Indonesia, and Uganda. Roger excels in managing multi-disciplinary teams, strategy development, and stakeholder engagement.



Karl Schlobohm

Company Secretary & CFO

Karl Schlobohm, a Chartered Accountant and Fellow of the Governance Institute of Australia, has over 30 years of experience across various industries. He is a Non-Executive Director of the Australian Shareholders Association and has held multiple executive roles with listed companies on the ASX, LSE, AIM, and TSX in the natural resources sector.



Josh Whitcombe

Chief Operating Officer

Dr. Josh Whitcombe, a Chartered Chemical Engineer and RPEQ, has over 20 years of Oil and Gas experience. He has held senior roles with Australian gas producers, worked offshore with Shell International, and has expertise in greenfield exploration and brownfield operations, focusing on technical challenges, HSE, and community outcomes.



Frank Glass

Chief Exploration Adviser

Frank Glass is a respected geologist with over 30 years of experience in oil, gas, and natural hydrogen exploration, including a decade with Shell. He holds a Master's in Structural Geology from the University of Amsterdam and memberships in the Petroleum Exploration Society of Australia and the European Association of Geoscientists and Engineers.

Board of Directors



Neil McDonald
Founder & Managing Director

Neil McDonald, with over 20 years of experience in the energy and minerals sectors across Australia, has worked on major exploration projects from greenfield to early development. He is a graduate of the Australian Institute of Company Directors.



Alexander Downer
Independent
Non-Executive Chair

Alexander Downer, a prominent Australian politician and diplomat, has held top roles including Leader of the Liberal Party and Minister for Foreign Affairs. Before politics, he was an executive director at the Australian Chamber of Commerce. He currently serves on boards like Hakluyt & Company and Yellow Cake Plc, and writes for the AFR, holding the Companion of the Order of Australia title.



Katherine Barnet
Independent
Non-Executive Director

Karl Schlobohm, a Chartered Accountant and Fellow of the Governance Institute of Australia, has over 30 years of experience across various industries. He is a Non-Executive Director of the Australian Shareholders Association and has held multiple executive roles with listed companies on the ASX, LSE, AIM, and TSX in the natural resources sector.



Roger Cressey
Executive Director
Commercial Operations

Dr. Josh Whitcombe, a Chartered Chemical Engineer and RPEQ, has over 20 years of Oil and Gas experience. He has held senior roles with Australian gas producers, worked offshore with Shell International, and has expertise in greenfield exploration and brownfield operations, focusing on technical challenges, HSE, and community outcomes.



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Karl Schlobohm
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