



**Dr Josh Whitcombe COO Gold Hydrogen Ltd**  
**PESA Symposium - Brisbane 11th September 2023**



# Important Notice & Disclaimer

This presentation is not a prospectus, disclosure document or offering document under Australian law or under any other law. It is for informational purposes only. This document does not constitute, and should not be construed as, an offer to issue or sell or a solicitation of an offer or invitation to subscribe for, buy or sell securities in Gold Hydrogen Limited ABN 74 647 468 899 (Gold Hydrogen).

Any material used in this presentation is only an overview and summary of certain data selected by the management of Gold Hydrogen. The presentation does not purport to contain all the information that a prospective investor may require in evaluating a possible investment in Gold Hydrogen nor does it contain all the information which would be required in a disclosure document prepared in accordance with the requirements of the Corporations Act and should not be used in isolation as a basis to invest in Gold Hydrogen. Recipients of this presentation must make their own independent investigations, consideration, and evaluation of Gold Hydrogen. Gold Hydrogen recommends that potential investors consult their professional advisor/s as an investment in Gold Hydrogen is considered to be speculative in nature.

Statements in this presentation are made only as of the date of this presentation unless otherwise stated and the information in this presentation remains subject to change without notice. Reliance should not be placed on information or opinions contained in this presentation.

To the maximum extent permitted by law, Gold Hydrogen disclaims any responsibility to inform any recipient of this presentation on any matter that subsequently comes to its notice which may affect any of the information contained in this document and presentation and undertakes no obligation to provide any additional or updated information whether as a result of new information, future events or results or otherwise.

No representation or warranty, express or implied, is made as to the fairness, accuracy, completeness or correctness of the information, opinions or conclusions contained in or derived from this presentation or any omission from this presentation or of any other written or oral information or opinions provided now or in the future to any person.

To the maximum extent permitted by law, neither Gold Hydrogen nor, any affiliates, related bodies corporate and their respective officers, directors, employees, advisors and agents (Relevant Parties), nor any other person, accepts any liability as to or in relation to the accuracy or completeness of the information, statements, opinions or matters (express or implied) arising out of, contained in or derived from this presentation or any omission from this presentation or of any other written or oral information or opinions provided now or in the future to any person.

This presentation contains “forward looking statements” concerning the financial condition, results of operations and business of Gold Hydrogen. All statements other than statements of fact or aspirational statements, are or may be deemed to be “forward looking statements”. Often, but not always, forward looking statements can generally be identified by the use of forward looking words such as “may”, “will”, “expect”, “intend”, “plan”, “estimate”, “anticipate”, “continue”, “outlook”, and “guidance”, or other similar words and may include, without limitation, statements regarding plans, strategies and objectives of management, future or anticipated production or construction commencement dates and expected costs, resources or reserves, exploration results or production outputs. Forward looking statements are statements of future expectations that are based on management’s current expectations and assumptions and known and unknown risks and uncertainties that could cause the actual results, performance, or events to differ materially from those expressed or implied in these statements. These risks include, but are not limited to price fluctuations, actual demand, currency fluctuations, drilling and production results, commercialization, reserve estimates, loss of market, industry competition, environmental risks, physical risks, legislative, fiscal, and regulatory developments, economic and financial market conditions in various countries and regions, political risks, project delay or advancement, approvals, and cost estimates.

Statements in this presentation as to gas and mineral resources has been compiled from data provided by Gold Hydrogen’s Chief Engineer, Mr. Billy Hadi Subrata. Mr. Hadi Subrata’s qualifications include a Bachelor and Master of Engineering Science from University of New South Wales, Sydney, Australia, and he is an active member of Engineers Australia and SPE. Mr. Hadi Subrata's has 18 years of relevant exploration, development and production experience in petroleum, conventional and unconventional hydrocarbons, and hydrogen. Mr. Hadi Subrata has sufficient experience that is relevant to Gold Hydrogen’s resources to qualify as a Reserves and Resources Evaluator as defined in the ASX Listing Rules 5.11. Mr. Hadi Subrata consented to the inclusion in this report of the matters based on his information in the form and context in which it appears.



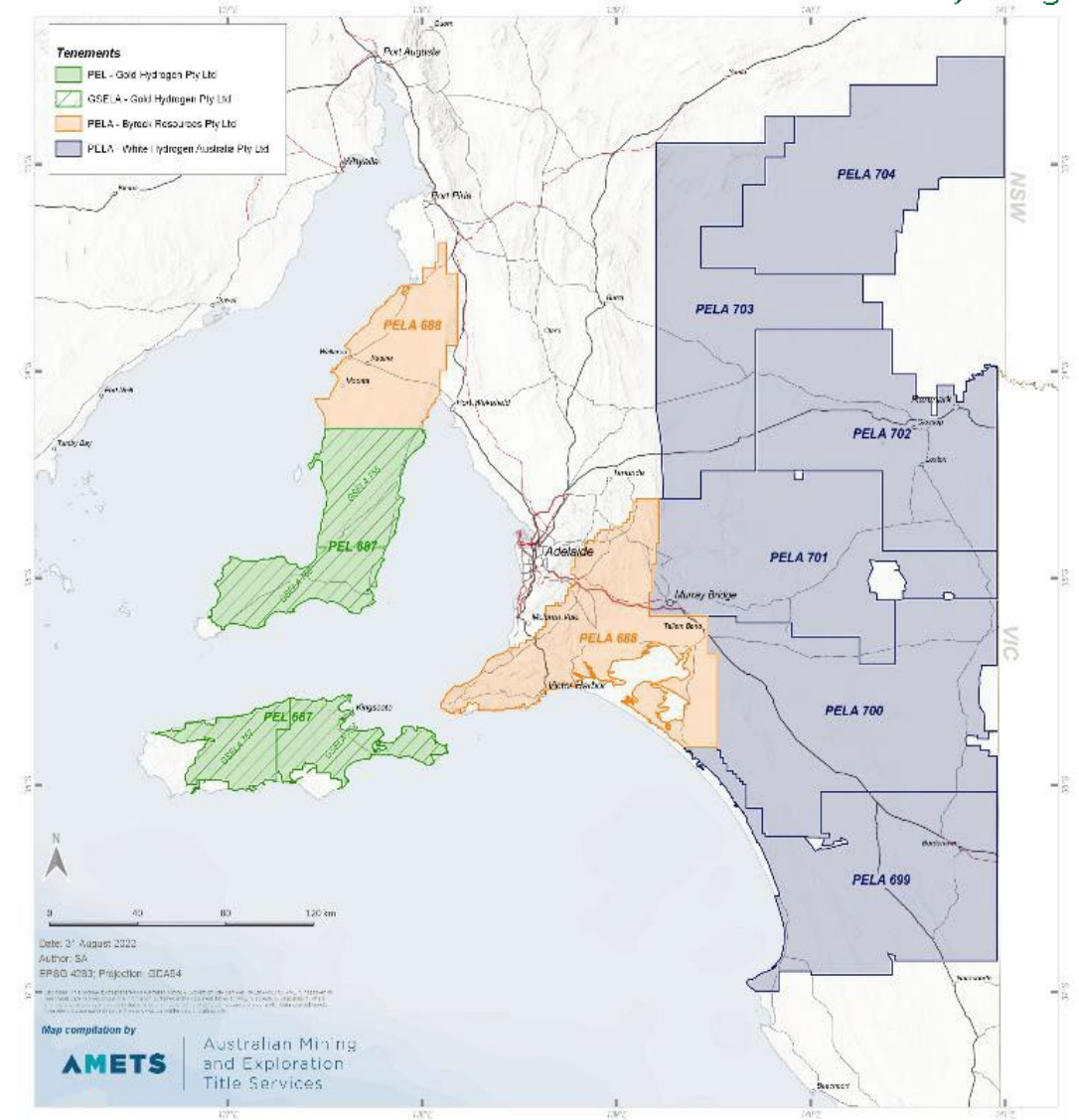
# Who Are We?

## Corporate:

- “GHY” listed on ASX on 13 January 2023.
- \$20 million raised, sufficient for first 2 years work program.
- Dedicated natural hydrogen exploration company

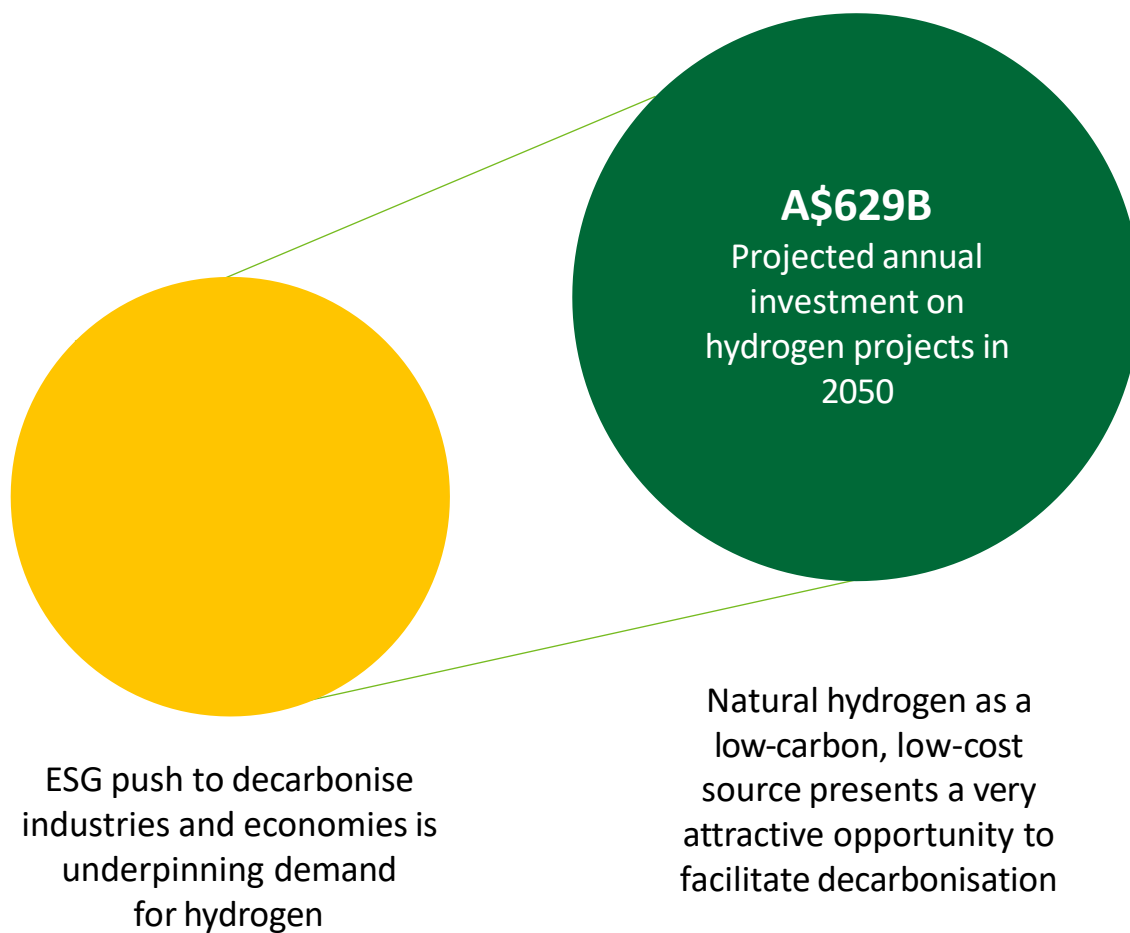
## Project:

- Large acreage position in South Australia, includes historic wells that encountered hydrogen.
- Plan to drill the Ramsay 1 and 2 hydrogen exploration wells in October and November 2023.
- Ramsay 1 will twin the original Ramsay Oil Bore 1 that encountered hydrogen.
- Plan to progress Prospective Resources into Contingent Resource for natural (white or gold) hydrogen.

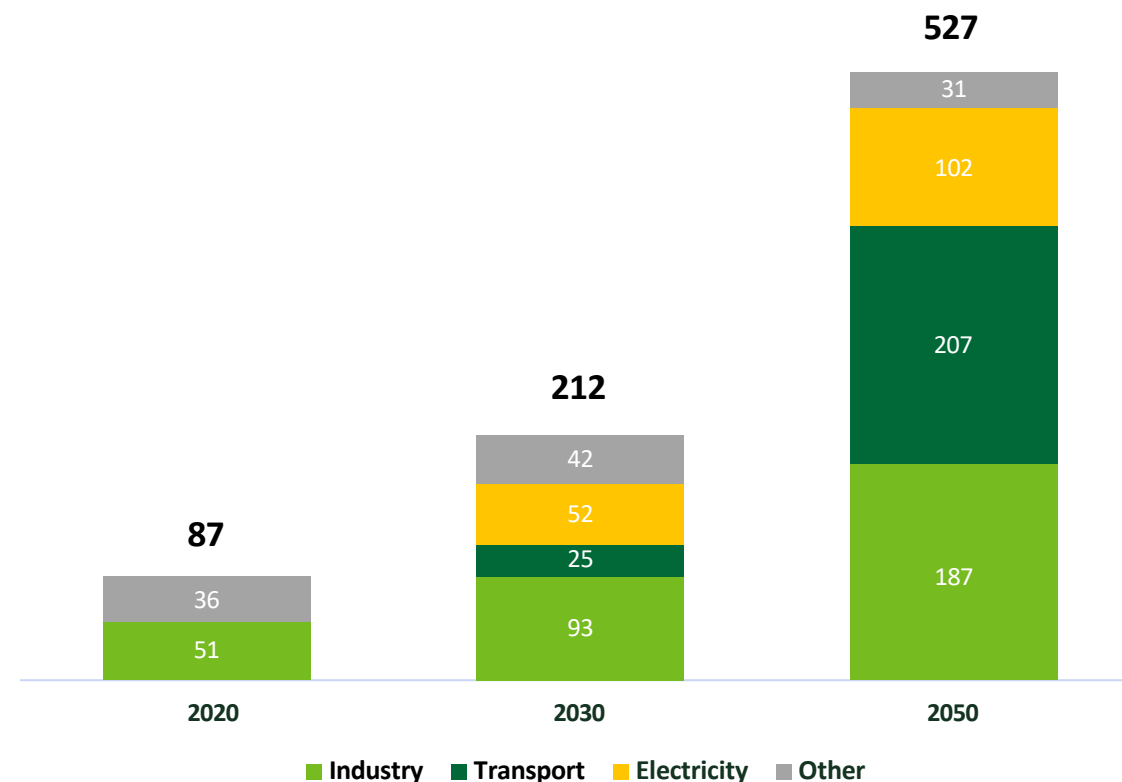


# Global Hydrogen Forecast

Substantial investment laying the foundation for hydrogen use



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



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

# Types of Hydrogen Production

Naturally occurring hydrogen offers a significant cost and carbon neutral advantage relative to other hydrogen production (manufacturing) processes.

	Natural	Grey	Black/Brown	Blue	Green
Energy source	Natural hydrogen	Natural gas	Coal	Natural gas / coal	Renewables / biomass
Environmental impact	Carbon-neutral	High	Very High	Low	Carbon-neutral
No thermal process	✓	✗	✗	✗	✗
Production cost (A\$/kg) <sup>1,2</sup>	\$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 <sup>3</sup>	✓	✗	✗	✗	✗

Today, ~95% of all hydrogen produced is from natural gas

Source: Frost and Sullivan, Sep-2022

1. P = Polymer electrolyte membrane electrolysis. A = Alkaline Electrolysis.

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

3. Source: Christophe Rigollet<sup>1</sup>, Alain Prinzhofer<sup>2,3</sup>, 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.”

# What is “Natural Hydrogen”

- It is naturally occurring hydrogen, believed to be generated from the interaction of water with the granite basement.
- CSIRO have shown a theoretical mass balance that allows the liberation of hydrogen through the interaction of our basement material and water.
- Unlike petroleum generated from a carbon-based source, hydrogen can be generated continuously over a longer timeframe and a wider temperature range, which means that hydrogen systems can renew and may possibly be renewable. Research on this matter is ongoing.
- Historical wells in the area have found high concentrations of hydrogen (up to 90%) while drilling. It is believed the hydrogen migrates / percolates through the limestone via the small porosity / permeability rather than accumulating in sandstone traps.
- Currently a working natural hydrogen field is in production in Mali, Africa.

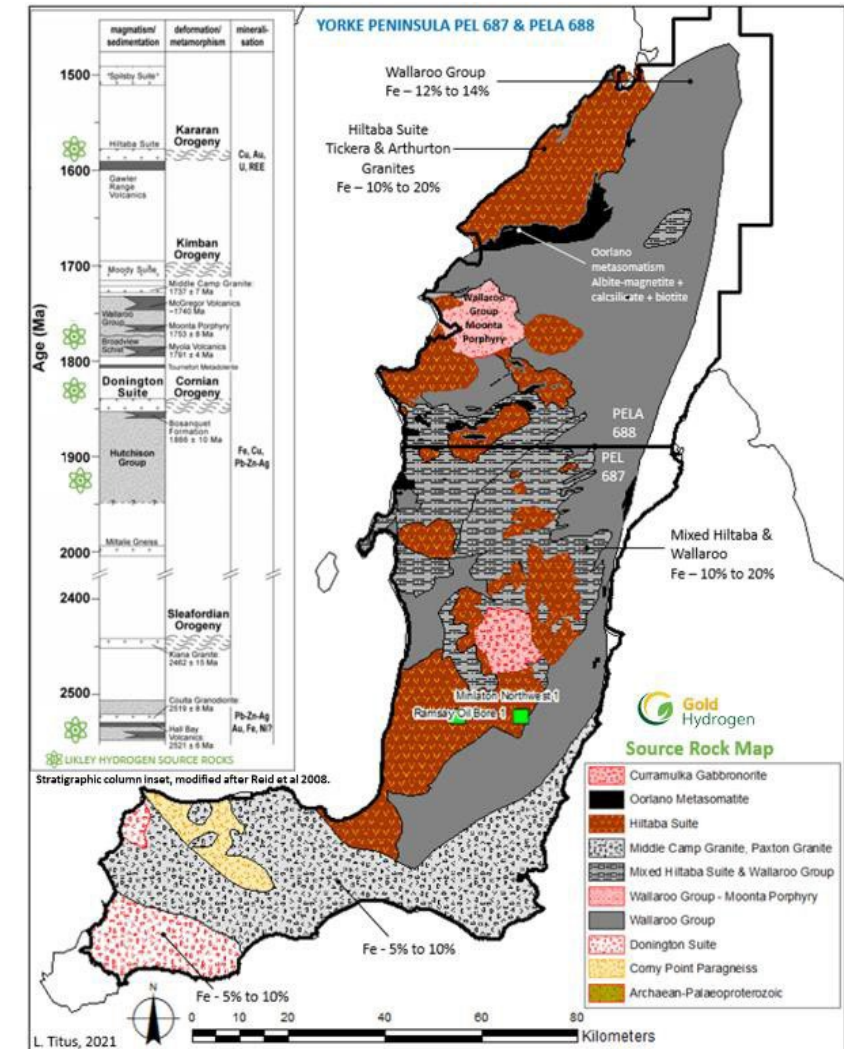


Figure: Ramsay Project source rocks at Yorke Peninsula

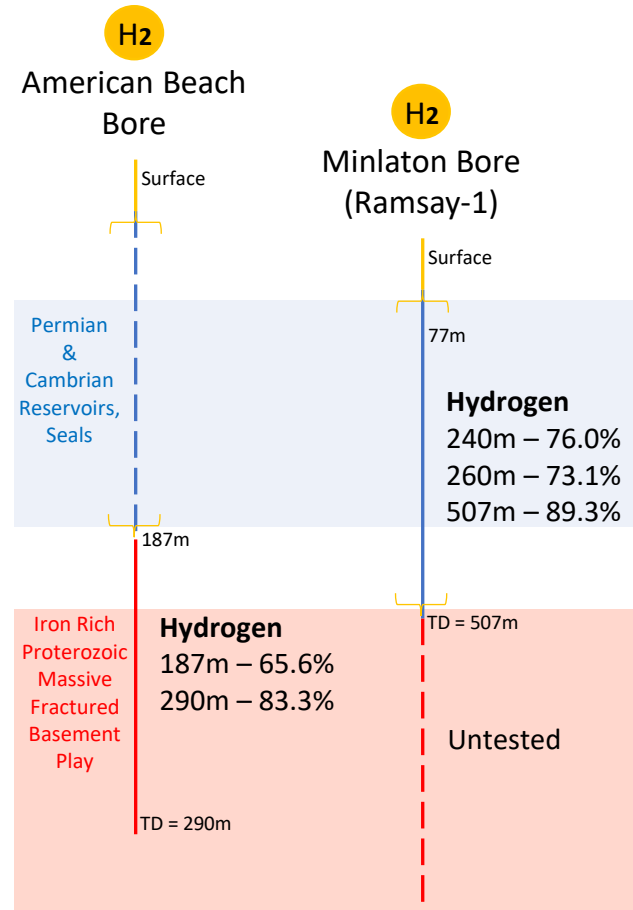


# Yorke Peninsula – a History of Natural Hydrogen

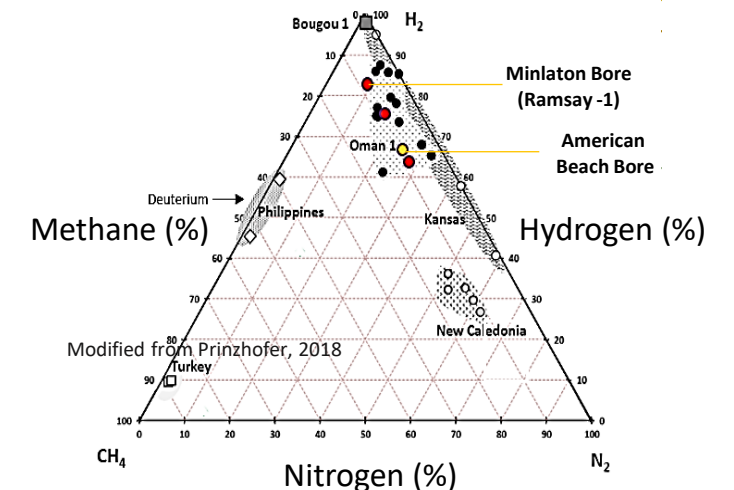
Ternary diagram of relative proportions of hydrogen, methane and nitrogen in PEL 687 compared to other natural hydrogen accumulations



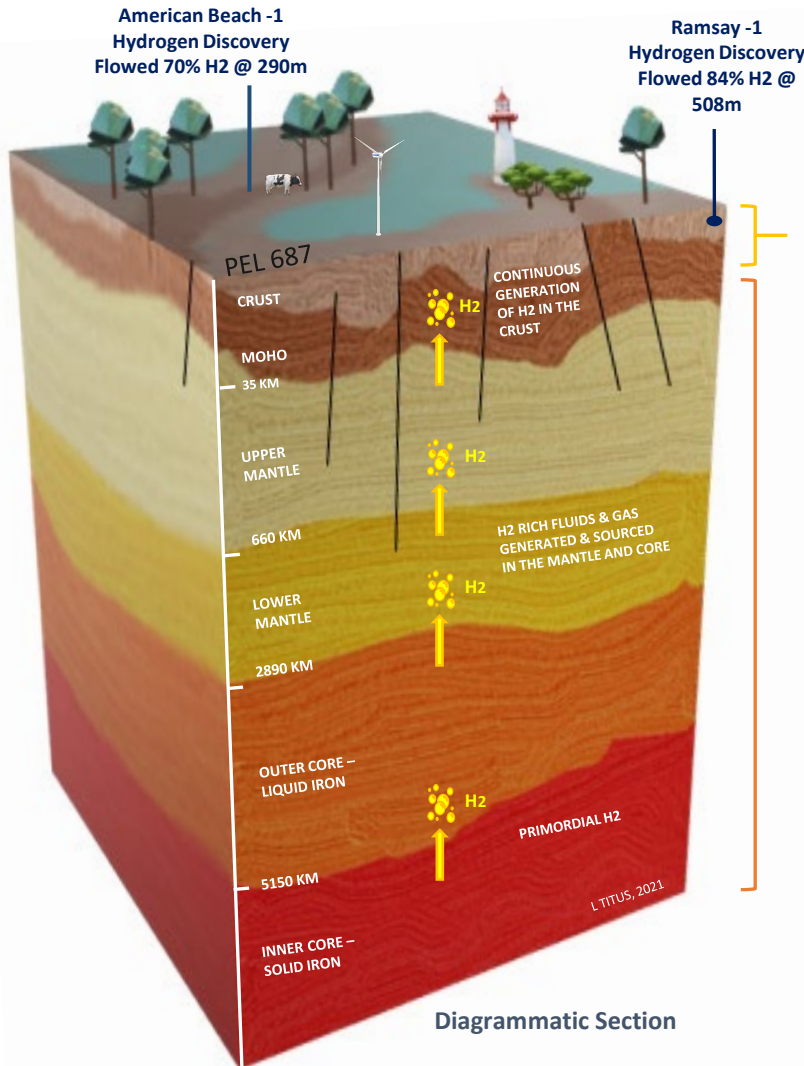
Gas sampling whilst drilling – Ramsay Oil Bore




Location	American Beach Borehole		Ramsay Borehole		
Depth (m)	187.4	289.5	240.8	262.1	507.8
<b>Sample Composition</b>					
CO <sub>2</sub> (%)	5.3	0.5	0.2	0.8	0
O <sub>2</sub> (%)	4.3	3.6	0	2.4	1.2
C <sub>2</sub> (%)	0.5	0.0	0	0	0
CO (%)	0	0.0	0	0	0
<b>H<sub>2</sub> (%)</b>	<b>51.3</b>	<b>68.6</b>	<b>76</b>	<b>64.4</b>	<b>84</b>
CH <sub>4</sub> (%)	2.6	4.7	7.5	7	0
N <sub>2</sub> (%) by difference	36	22.6	16.3	25.4	14.8
<b>Air Corrected Values</b>					
CO <sub>2</sub> (%)	6.8	0.6	0.2	0.9	0
<b>H<sub>2</sub> (%)</b>	<b>65.6</b>	<b>83.3</b>	<b>76</b>	<b>73.1</b>	<b>89.3</b>
CH <sub>4</sub> (%)	3.3	5.7	7.5	7.9	0
N <sub>2</sub> (%)	24.3	10.4	16.3	18.1	10.7



# Gold Hydrogen Prospective Resources



Certified Prospective Hydrogen Resources, existing discoveries and drill ready hydrogen prospects

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

**Calculated Volume not Determined**

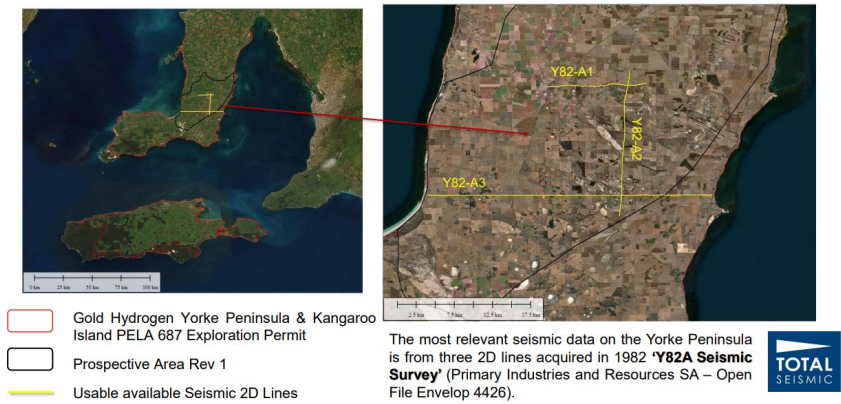
**NOTE** - All estimates are unrisked and aggregated arithmetically by category, hence caution that the aggregate low estimate maybe a conservative estimate and the aggregate high estimate maybe very optimistic estimate due to the portfolio effects of arithmetic summation. The estimated quantities of hydrogen 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, risk of development and risk of commercialization. Further exploration, appraisal and evaluation is required to determine the existence of a significant quantity of potentially recoverable Natural Hydrogen.

See ASX release of 13 January 2023 for full details and notes.

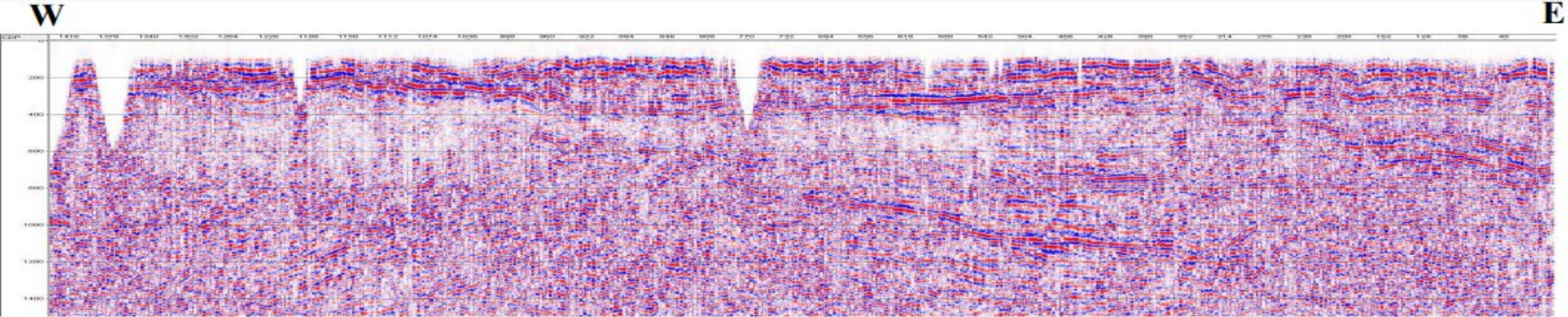


# Geology of the Yorke Peninsula- Structure

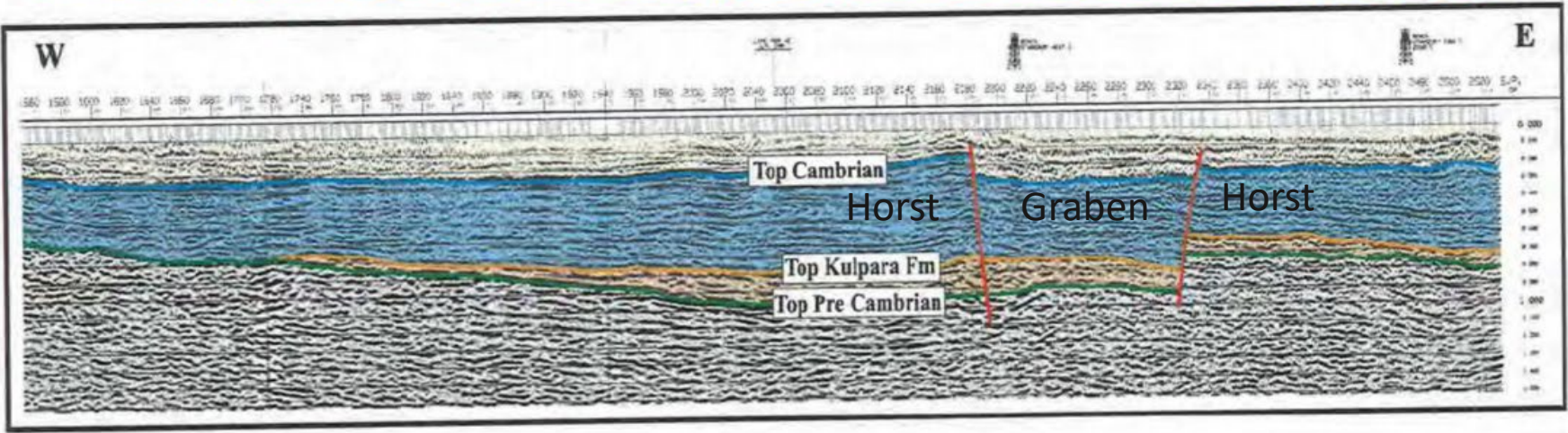
Horst and graben 'extensional' structural setting will significantly enhance fracture basement play



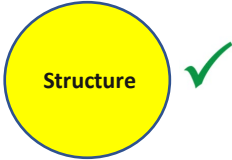
Y82-A3 Seismic Line



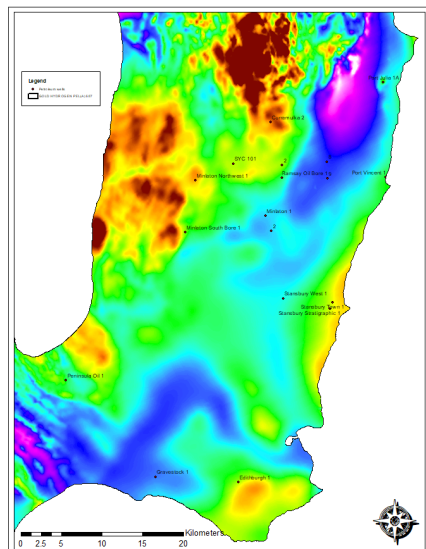
Available migrated stack in SEG-Y format



Interpreted (0-1500 msec TWT)  
stack after Benjamin Royal,  
2003

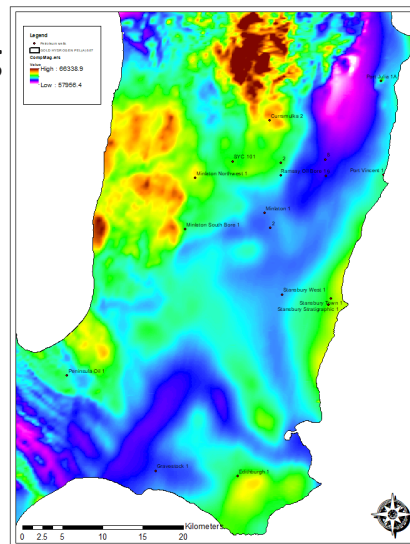


# Recently Acquired Airborne Gravity Magnetic Survey



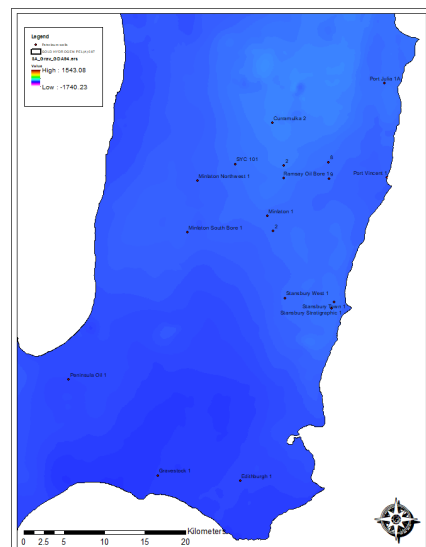
Magnetic Survey Imaging

Old Data → New Data



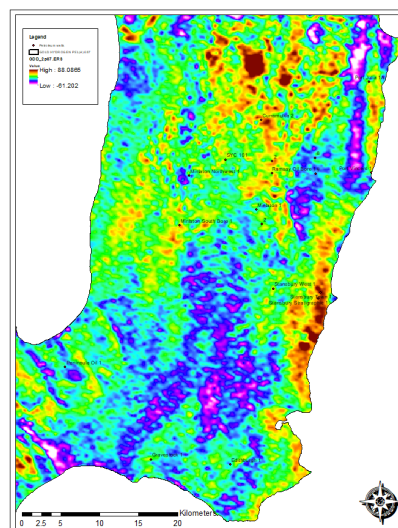
## New Magnetic Survey – Preliminary Imaging

- Sharper contrast in formations under the Cambrian.



Gravity Survey Imaging

Old Data → New Data

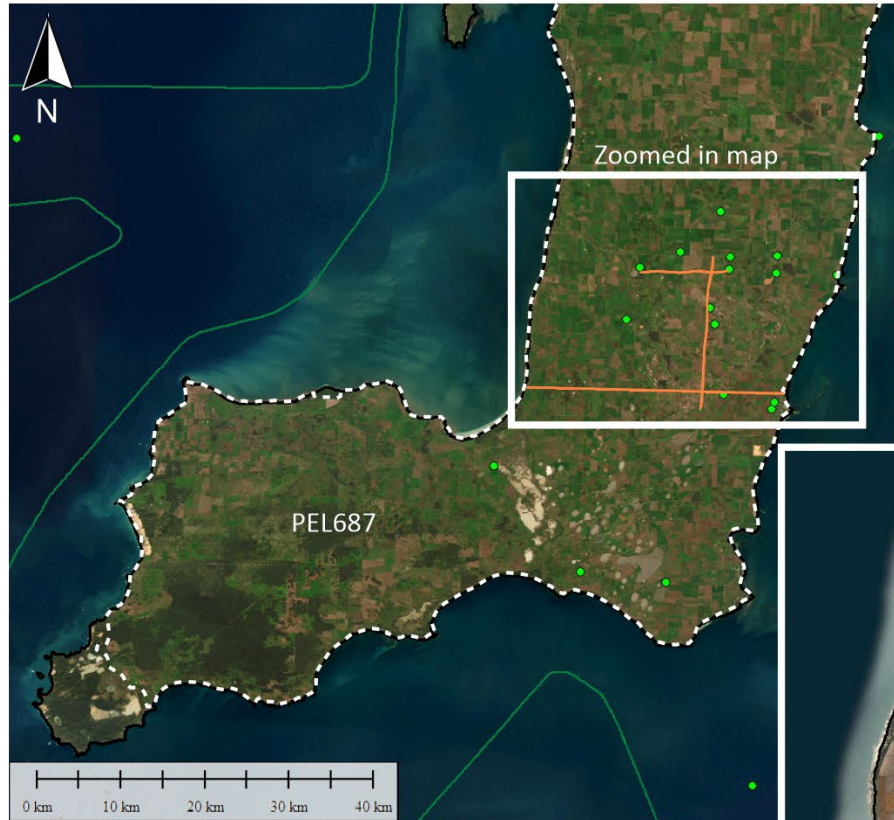


## New Gravity Survey – Preliminary Imaging

- Substantial improvement in data quality



# The Ramsay Project



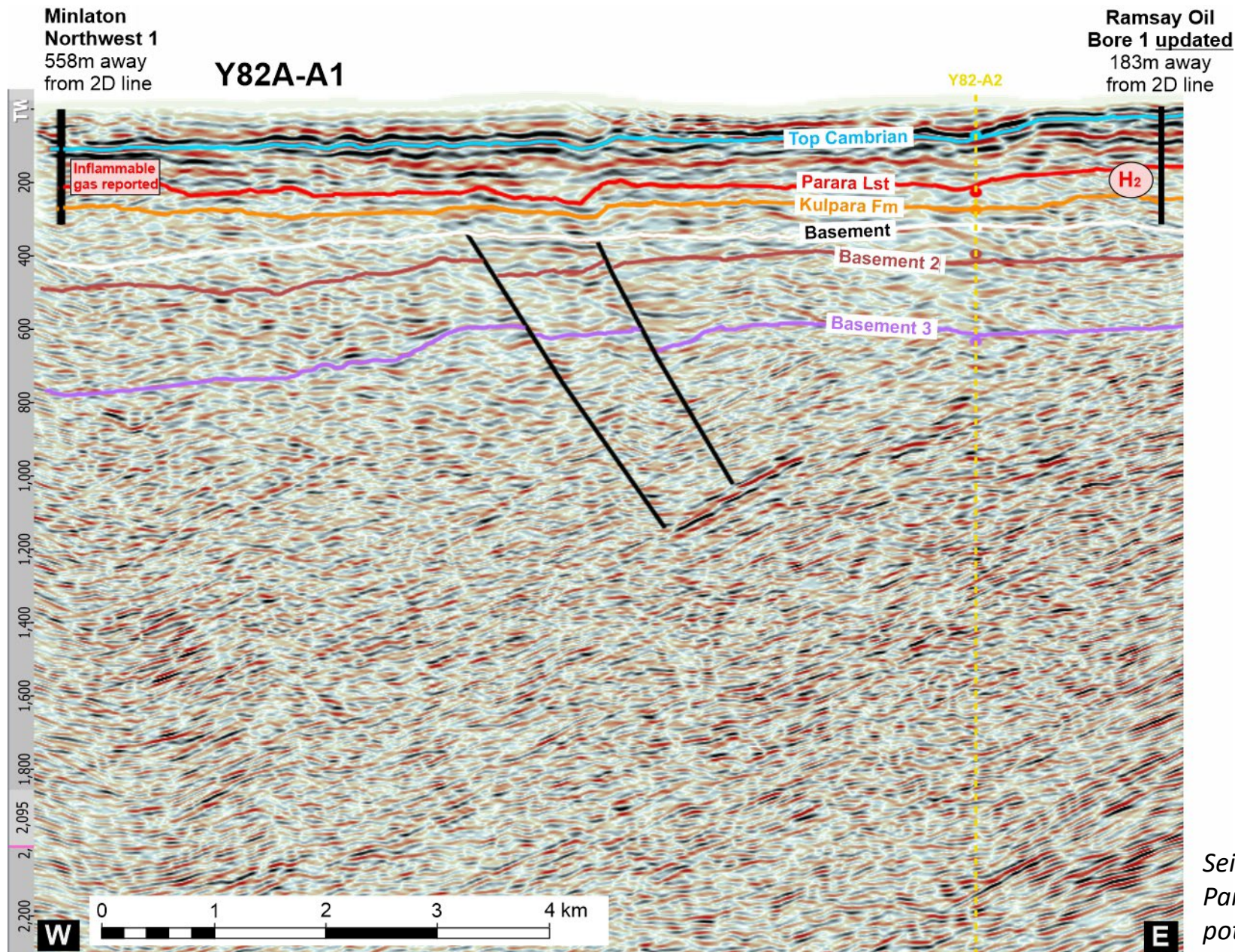
## LEGEND:

- Petroleum wells
- Ramsay Oil Bore 1 (updated location)
- Relevant onshore 2D seismic lines
- Relevant offshore 2D seismic lines
- PEL687 permit outline

- Gold Hydrogen is planning to drill a dedicated hydrogen exploration well in October 2023.
- First well will twin the historical Ramsay Oil Bore 1.
- Ramsay 1 will test for hydrogen in the Cambrian (limestone) above the granite basement.
- Planning underway for Ramsay 2, approx. 500m to the west of Ramsay 1.
- Different drilling challenges compared with traditional oil and gas.







## Ramsay 1

- First well will twin the historic Ramsay Oil Bore 1 that recorded hydrogen in the Limestone (Parara and Kulpara Formations).
- Well is planned to tag the granite basement, which is believed to be the source of the hydrogen.
- Full geological logs and samples will be taken.
- Second well planned for ~500m west of the first well.
- Multiple picks for the basement, with top basement expected between pick 1 and 2.

*Seismic interpretation showing hydrogen occurrences in Parara and Kulpara Formations at Ramsay Oil Bore 1, and potential basement tops*





**Gold Hydrogen Ltd (ASX: GHY)**  
Level 14, 110 Eagle Street, Brisbane  
+61 7 3521 8038

Website: [goldhydrogen.com.au](https://goldhydrogen.com.au)  
Twitter: [@GHY\\_ASX](https://twitter.com/GHY_ASX)

**Dr Josh Whitcombe**  
**Chief Operating Officer**  
[jwhitcombe@goldhydrogen.com.au](mailto:jwhitcombe@goldhydrogen.com.au)