

10<sup>th</sup> January 2024

ASX Market Announcements  
ASX Limited  
20 Bridge Street  
Sydney NSW 2000

## **Verification of Recently Completed Petrophysical Evaluation of the Judith-1 Well**

### **Judith Gas Field - Vic/P47 Exploration Permit**

#### **Highlights**

- **Results of an updated petrophysical evaluation completed in September 2023 provided significant order of magnitude increases in permeabilities over previous analyses and also confirmed previous analyses of gas saturations along with the presence of mobile gas columns in the Judith-1 well drilled by Shell in 1989.**
- **Results of the updated petrophysical evaluation have now been provided via detailed management presentations to several interested companies.**
- **As a result of these interactions with interested companies, an additional study has been undertaken to further verify the permeability results of the petrophysical evaluation using direct comparison with laboratory analysed core data over an equivalent sand sequence in the Longtom-2 Well. (The Longtom Field is located 15km to the west of Judith).**
- **Judith-1 interpretation algorithms have been confirmed as appropriate when tested against these core measurements at Longtom-2.**
- **Additionally, core data from the adjacent producing Kipper Field provides permeability and water saturation interpretation that is most consistent with the updated Judith petrophysics, confirming that the updated Judith-1 permeability interpretation 'most likely' case is reasonable.**

In September 2023 Emperor Energy announced the results of a new petrophysical evaluation of the Judith-1 gas discovery well, offshore Gippsland, Victoria, Australia. The evaluation was completed by respected industry expert Steve Adams at The Petrophysicist Limited (TPL). The evaluation used new methodology for reservoir evaluation successfully applied by TPL to other gas field locations in the Gippsland Basin.

The evaluation provided significant order of magnitude increases in permeabilities over previous analyses (Table 1), while confirming the previous analysis of mobile gas columns and gas saturations determined by (Cernovskis, 2022).

Emperor Energy has since provided the results of this study via detailed management presentations to a number of companies with interest in the offshore Gippsland Basin. The data presented has changed perceptions of the Judith Gas Field reservoir quality and as a result, discussions are ongoing with these companies.

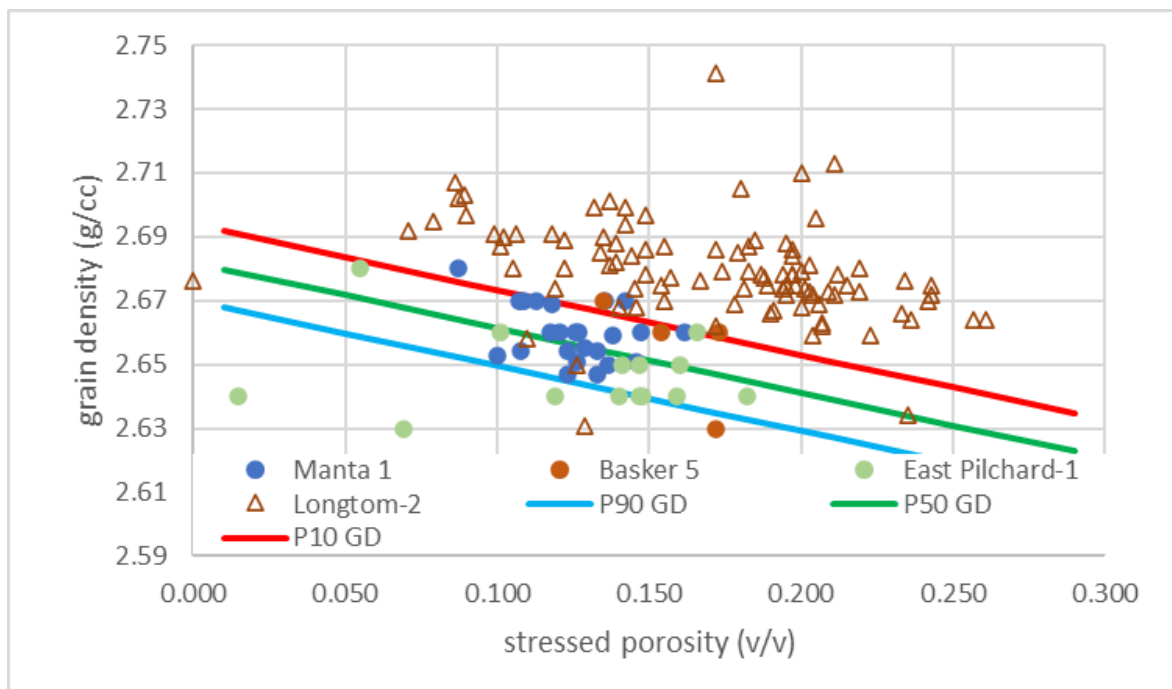
Stemming from these discussions with interested companies, Emperor has undertaken additional verification of the petrophysically derived reservoir permeabilities in the Judith-1 gas sands. In the absence of flow tests, the available data consists of formation pressure tester (RFT) mobilities from Judith-1 along with available core data acquired over equivalent Judith sands in the Longtom-2 well at the Longtom Gas Field located 15km to the west of Judith.

Emperor Energy's petrophysicist, Steve Adams (TPL), tested the Judith interpretation algorithms in Longtom-2 and successfully reproduced porosities and permeabilities matching the core measurements while using the same algorithms as applied in the updated Judith petrophysics evaluation. Gas saturations calculated are also consistent with those at Longtom-2 and formation gas flow rates, and this test confirms that the Judith-1 interpretation algorithms are appropriate.

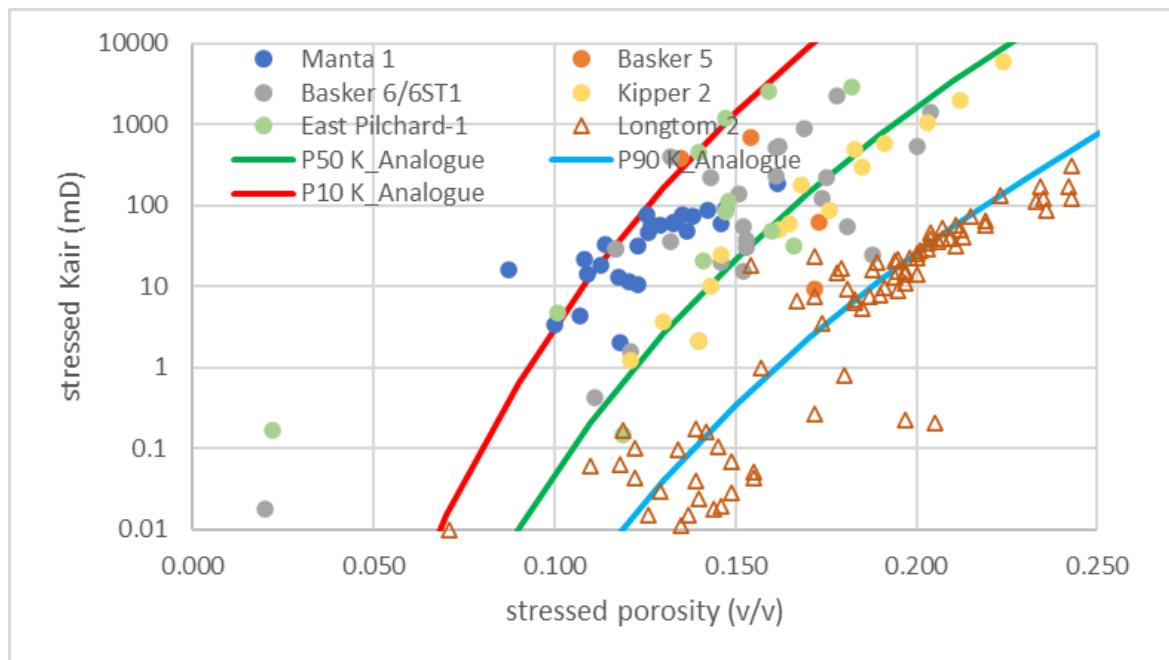
#### Notes:

1: Most previous interpreters erroneously assumed that Judith-1 RFT permeabilities reported in the well documentation were mobilities - they were not. Emperor went back to the original log prints and extracted actual measured RFT mobilities from the recorded pressure data.

2: As noted by the Shell in its well completion report, most Judith-1 RFT's were taken in wellbore with severe formation damage (indicated by well-bore washouts on the caliper log) due to mud filtrate invasion which compromised pressure readings. Mobilities from the Judith-1 RFT's are therefore likely to be *minimum values*, sometimes much less than the values that would otherwise be obtained in less damaged hole.



**Figure 1 – Stressed porosity and grain density are compared for data from different wells adjacent to Judith-1 in analogous formations. Note the Longtom-2 data is anomalously high, suggesting significant carbonate cementation not observed in core data from other wells.**



**Figure 2 – Stressed porosity and permeability are compared for data from different wells adjacent to Judith-1 in analogous formations. Note that the Longtom-2 data falls on a poorer trend than the data from the other cored wells. Again, carbonate cementation is the interpreted cause.**

The key outcomes of the September 2023 Petrophysical Evaluation are summarized in Table 1 below. The study provided further independent analysis and interpretation supporting the presence of mobile gas along with an order of magnitude increase in permeabilities.

Zone	Depth	Interpretation	Net Thickness	Porosity %	Av. Permeability mD	Av. Gas Saturation %
Gas Sand 1	2370m to 2441m	Mobile Gas	40.5	14.1	12.3	52.2
Gas Sand 2	2489m to 2543m	Mobile Gas	38.8	15.0	24.2	63.8
Gas Sand 3	2626m to 2720m	Mobile Gas	63.1	13.6	5.2	61.1
Gas Sand 4	2778m to 2839m	Mobile Gas	47.1	12.6	1.6	56.4

**Table 1: Key outcomes from Judith-1 Petrophysics Evaluation**



# JUDITH-1

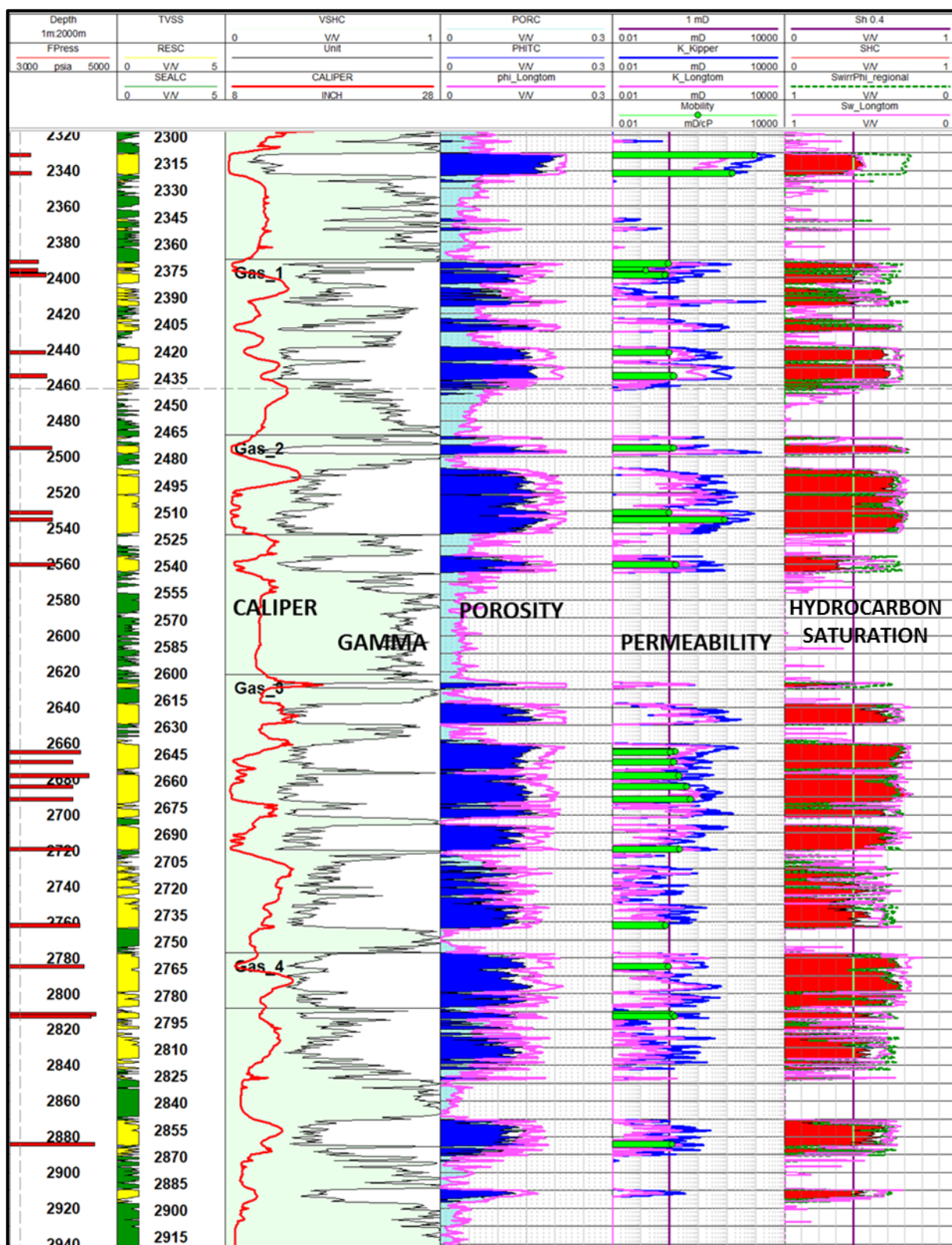


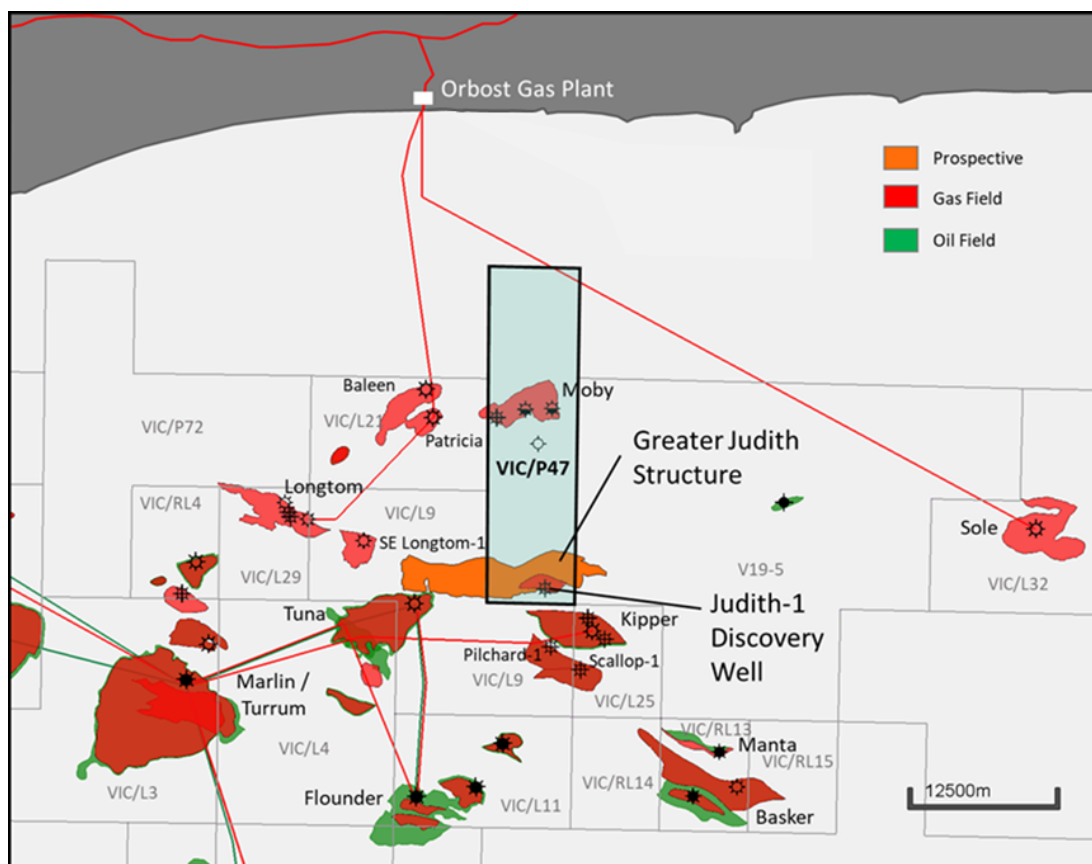
Figure 3 – Simplified display of the petrophysical evaluation through the four interpreted mobile gas sands in Judith-1. Note the log evaluation using the Longtom-2 core parameters is shown in magenta.

## Biography – Steve Adams

Steve has MSc in Physics with First Class Honours. He has been a Petrophysicist since 1987. Following training and an initial 7 years with Shell, he has worked as an independent consultant with clients in Australasia, Asia, Europe, the Middle East and elsewhere. Steve has also worked extensively for Reserves Auditing companies including Gaffney-Cline, RPS and RISC. Steve is a member of the SPWLA and the SPE. Steve has more than 20 papers published and is highly regarded in the Industry as a Technical Expert. Steve is a Specialist in Saturation-Height Modelling. His 2016 book “Saturation-Height Modelling for Reservoir Description” has been well received. Steve has been providing petrophysically-focussed training courses since 2001.

**Emperor Energy** is focused on the development of the Judith Gas Project located 40km offshore from the Orbost Gas Plant in the Gippsland Basin, Victoria. The project requires drilling of a successful Judith-2 appraisal well to prove Gas Reserves and subsequently provide economic justification for gas field and processing plant development.

Emperor Energy has de-risked the project through systematic analysis of all available data from the Judith-1 Gas Discovery Well (drilled by Shell in 1989) and by licensing access to new MC3D seismic data that was acquired in 2020 to define a Prospective Resource for the Greater Judith structure, and Contingent Resource around the Judith-1 location.



**Figure 4: Location of 100% Emperor Energy owned Vic/P47 in the offshore Gippsland Basin (Bass Strait), showing the Judith Gas Field and proximity to Orbost Gas Plant, along with nearby oil and gas fields.**

We thank shareholders and our team for their ongoing support and welcome any questions they may have.

This announcement has been authorised for release to the market by the Board of Directors of Emperor Energy Limited.

Yours faithfully



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**Company Secretary**

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