IMPORTANT CONTRIBUTIONS IN GEOSCIENCES
PROMISE TO REVOLUTIONIZE O&G&M EXPLORATION. No 1/6.

EDINSON ALVAREZ[1]
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Researcher of tectonic and structurally complex areas.

Complex Source Theory (Edinson Alvarez 2025): A mechanism used by interdisciplinary groups of specialists in any field of science, where new concepts, new methodologies, new technology, and new knowledge are employed, obtaining new results, in order to resolve complex issues.. (Image Courtesy of Pixabay).

INTRODUCTION

The Sinú San Jacinto SSJJ basin and the lower Magdalena Valley Basin, according to C-R Posada Saldarriaga et al. 2024, offer significant hydrocarbon prospectivity potential estimated for VIM at 3.18 tcf for Gas and 0.731 tcf Wet Gas, and a lower value than this range is estimated for SSJJ. According to ANH 2022, the values for Oil are 2,165 and 4,922 Mmboe respectively. Different studies by ANH 2012 and Explorasur 2012, among others, report important surface sources of crude oil and gas, in addition to the existence of important O&G fields in the area.

METODOLOGY

These graphs show the prospective corridors of interest (buffer) published by the National Hydrocarbons Agency (ANH 2022) (gray, red, and purple areas in the graph) around the main producing fields.

This work uses innovative tools from Complex Source Theory (Edinson Alvarez 2025 Definition) to extend the prospective corridors proposed by the ANH 2022 (Figure 1).

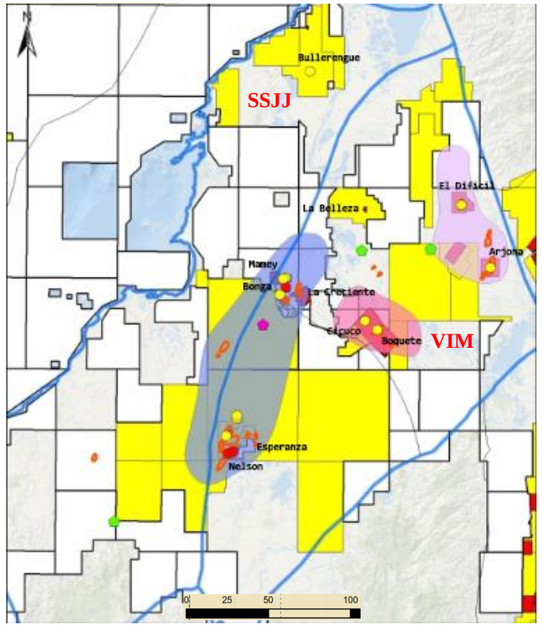

Figure 1. ANH 2022 prospective corridors, for the Sinú San Jacinto SSJJ and lower Magdalena Valley VIM basins.

In addition to traditional tools such as: Seismic interpretation, structural geology, geochemistry, stratigraphy, well information, reservoir information, flow lines, plays, and others..

RESULTS

All this information has been integrated, allowing us to determine or establish the prospective corridor in dark yellow. This work was submitted to Ecopetrol in July 2022. (Figure 2).

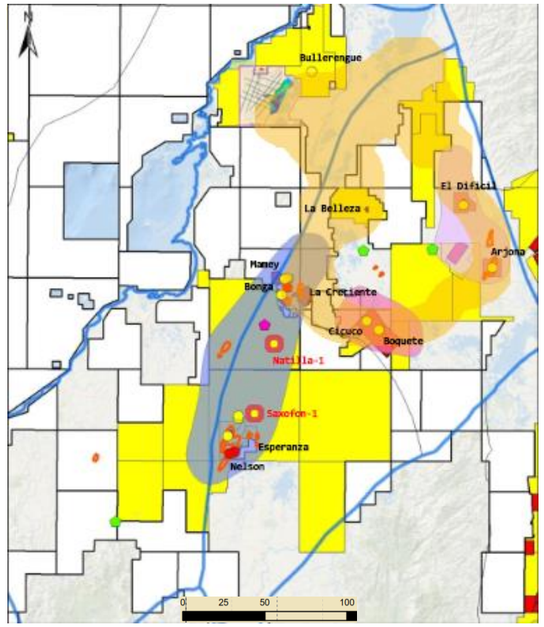

Figure 2. New prospective corridor proposed by the author, submitted to Ecopetrol in July 2022. Versus prospective corridors ANH 2022 for the Sinú San Jacinto SSJJ and Lower Magdalena Valley VIM basins. (Northern sector, Southern sector in the full report)

The good news came in 2023, when Canacol Energy reported the discovery of hydrocarbons in the DiviDivi1 well in January 2023 in the VIM basin, just within the new dark yellow predictive prospecting corridor, six months after it was presented to Ecopetrol. (Figure 3).

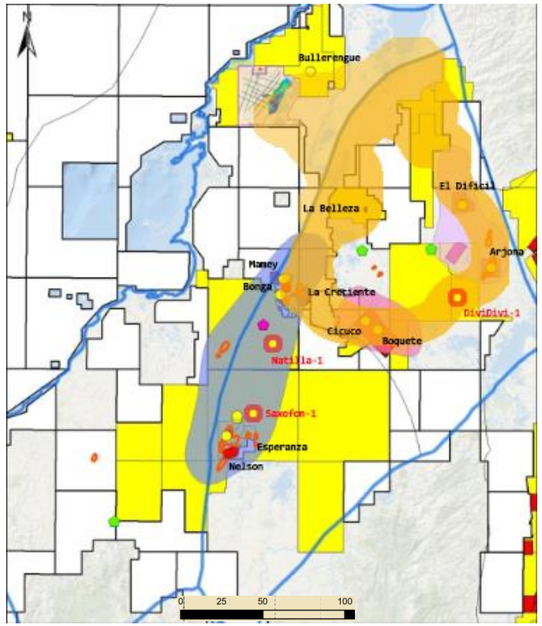

Figure 3. Canacol Energy announces the discovery of hydrocarbons in the DiviDivi1 well, within the proposed Dark Yellow prospect corridor in the VIM basin. Six months after the predictive model was presented.

Then, in December 2023, Lewis Energy-Hocol reported a new hydrocarbon discovery in the Bullerengue Oeste5 well in the Sinú Sanjacinto Basin, on the edge of the proposed new predictive prospect corridor (dark yellow). This is 17 months after the model was submitted (Figure 4).

These two hydrocarbon discoveries, made in 2023, after the predictive model was submitted to Ecopetrol in July 2022, demonstrate the effectiveness of the model with proven results.

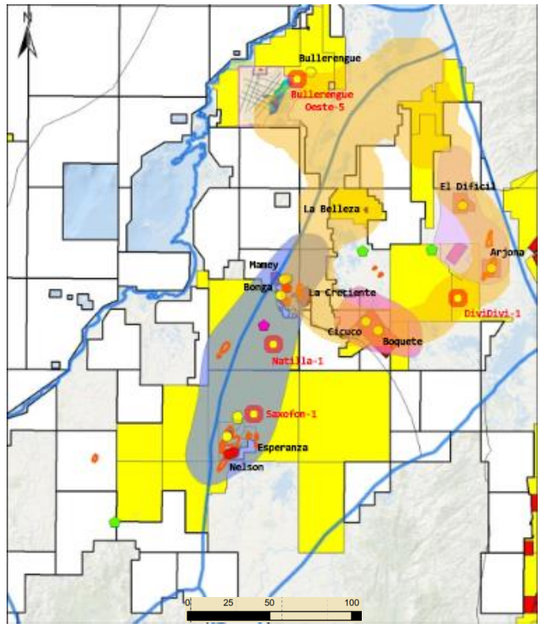

Figure 4. Lewis Energy-Hocol announces the discovery of a new hydrocarbon well, the Bullerengue Oeste5, within the Dark Yellow prospect proposed by the Author. In the Sinu San Jacinto SSJJ basin. Seventeen months after the predictive model was presented.

The above discoveries are outside the area of interest proposed by ANH 2022 (gray, red, and purple areas), Figure 5. However, they are within the range of the predictive model proposed by Author 2022 (dark yellow area in Figure 4)..

This also demonstrates a positive result in terms of the scope, value, and contribution of the Complex Source Theory (EA2025) tools. In this case, to expand hydrocarbon prospectivity corridors in these basins, Also points out other positive results obtained with this new tool.

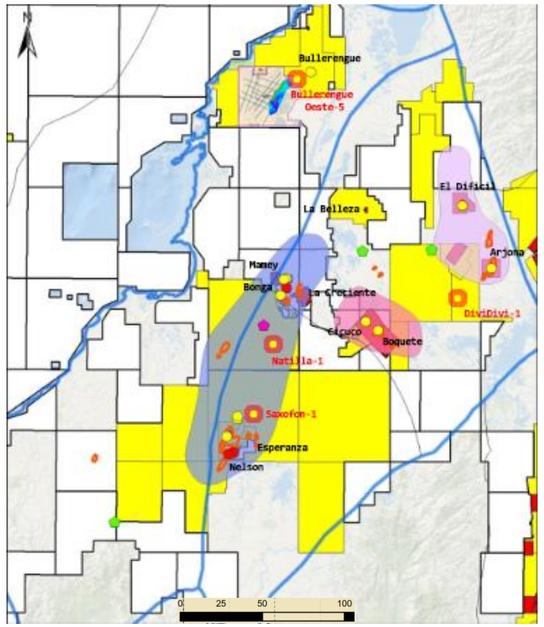

Figure 5. New discoveries by the companies Canacol Energy and Lewis Energy –Hocol, are located outside the ANH 2022 prospective corridors, for the Sinú San Jacinto SSJJ and lower Magdalena Valley VIM basins.

DISCUSSION

It is important to highlight that the predictive model presented here requires rigorous analysis to identify the best prospects and exploration opportunities in order to obtain the best possible results. The structural aspect plays a very important role, which, according to various authors, is complex for the Sinú San Jacinto SSJJ basin and somewhat less complex for the VIM lower Magdalena Valley. Added to this is the difficulty in obtaining seismic images with good quality information. This latter aspect has also been overcome with TSC.

A more detailed analysis and solution to problems of high structural complexity can be consulted with the author of this article.

CONCLUSION

The above discoveries and/or results strengthen and help confirm the predictive model of a prospective corridor presented by Dr. Edinson Alvarez, a geologist specializing in exploration, Oil, gas and mining. This model, in addition to other results, will be included in a new release. Validating his Complex Source Theory,

It has deserved him recognition for his contributions to geoscientific knowledge in Colombia from the Institute of Stratigraphic Research (IIES) of the University of Caldas, PhD Andrés Pardo, Director; from the Master of Earth Sciences program at the University of Caldas, MSc Arley Gomez, Director; and from Clemencia Gómez, PhD, Professor of the Geosciences Department at the-National-University-of-Colombia.

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Exploration Geologist Specialist - Geophysicist, expert in O-&-G-Mining integrated studies (Colombia, Perú and México), Giving solutions to geoscientific problems, which have been in uncertainty for more than 5 decades. With important + economic implications.

The God´s grace guide us to develop the ¨Complex Source Theory¨, a new mechanism that allow us increasing traditional O&G&M discoveries, production, reserves, as new energies and CCUS.

Geological mapping, surveys design, processor PSTM (Conv-3C-4C-TZ-OBC), geomodeller, seismic interpreter and reservoir characterization (Conventional-and-Unconventional Reservoirs). Stratigraphic sequence, seismic attributes, AVO analysis, fluids substitution, seismic inversion, risk and uncertainty, leads and prospects, reserves.

Discovery of New prospective corridors and O&G prospects, in Foothills, Llanos, Putumayo, VIM, VMM, GuajiraOff-Guajira, SSJJ, Colombia basin.

Canacol Energy And Lewis Energy-Hocol Discoveries 2023, Support predictive corridor model to find new O&G reservoirs.

Sinu San Jacinto SSJJ, and Valle Inferior del Magdalena VIM Basin. Colombia.

Autor: Edinson Alvarez Geoscientist-2025- edinson.alvarez@gmail.com

Introducción

La cuenca del Sinú San Jacinto SSJJ y la Cuenca del Valle inferior del Magdalena, Según C-R Posada Saldarriaga et al. 2024, ofrecen un potencial importante de prospectividad de hidrocarburos estimados para VIM en 3.18 tcf para Gas y 0.731 tcf Wet Gas, y se estima un valor menor a este rango para SSJJ. Diferentes estudios de la ANH 2012 y Geokinetics 2008, entre otros reportan importantes manaderos de crudo y gas, además de conocerse la existencia de importantes campos O&G en el área. Las presentes graficas muestran los corredores prospectivos de interés (buffer), publicados por la Agencia Nacional de Hidrocarburos ANH 2022 (**Áreas Gris, Roja y lila en el gráfico**), alrededor de los principales campos productores. El presente trabajo utiliza como novedad herramientas de la Teoría de Fuente Compleja (Definición Edinson Alvarez 2025), para extender los corredores prospectivos propuestos por la ANH 2022. Adicional de las herramientas tradicionales como: Interpretación sísmica, geología estructural, geoquímica, estratigrafía, información de pozo, de reservorio, líneas de flujo, plays, entre otros… Para Lograr determinar el **corredor prospectivo en color amarillo.** Trabajo Presentado a Ecopetrol en julio de 2022. La Grata Sorpresa se da en enero de 2023, cuando la empresa Canacol Enegy informa del descubrimiento del pozo productor **DiviDivi1** en enero del 2023 en la cuenca VIM, Justo dentro del nuevo corredor prospectivo amarillo, 6 meses después de presentado. Luego en Diciembre de 2023, la empresa Lewis Energy-Hocol, reporta un nuevo descubrimiento en el pozo **Bullerengue Oeste5**, en la Cuenca del Sinú Sanjacinto, en límite del nuevo corredor prospectivo propuesto (color amarillo). 17 meses después de haberse presentado el modelo. Los anteriores descubrimientos se encuentran por fuera del área de interés propuesta por la ANH 2022 (área gris, roja y lila), **pero están dentro del rango propuesto por el Autor2022 (área Amarilla)**. Lo anterior nos muestra un resultado positivo en cuanto al alcance, valor y aporte de las herramientas de la Teoría de Fuente Compleja-EA2025, como de otros resultados obtenidos con esta nueva herramienta. Lo que le ha servido para el **reconocimiento por aportes al conocimiento geocientifico por parte del Instituto de Investigaciones Estratigraficas IIES de la Universidad de Caldas, Phd Andrés Pardo-Director; de la Maestria en Ciencias de la Tierra de la Universidad de Caldas, Msc Arley Gomez-Director, y de la Profesora del Area de Geosciencias de la Universidad Nacional de Colombia Phd Clemencia Gómez.**

Definición:

Teoría de Fuente Compleja (Edinson Alvarez 2025): Mecanismo utilizado por grupos interdisciplinarios de especialistas en cualquier campo de la ciencia, donde se emplean nuevos conceptos, nuevas metodologías, nueva tecnología, nuevo conocimiento, obteniendo nuevos resultados, con el fin de resolver temas complejos.

Canacol Energy And Lewis Energy-Hocol Discoveries 2023, Support predictive corridor model to find new O&G reservoirs.

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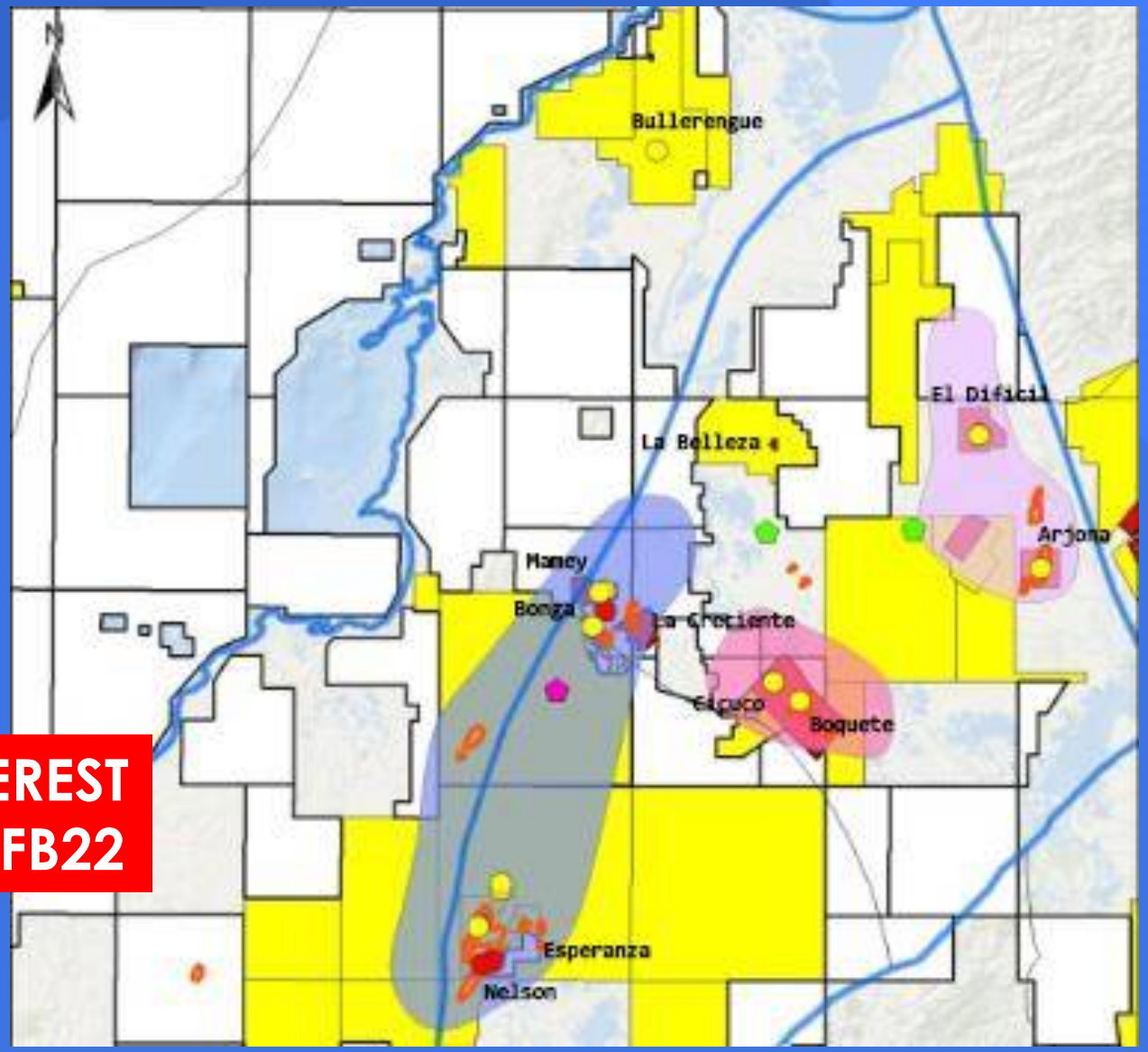
CANACOL AND LEWIS ENERGY'S DISCOVERIES 2023- SUPPORT PREDICTIVE MODEL TO FIND NEW O&G RESERVOIRS PRESENTED TO ECOPETROL 2022.(PART C) VIM-SSJ-COLOMBIA

EDINSON ALVAREZ
GEOLOGIST-OIL EXPLORATION SPECIALIST

CANACOL ENERGY'S DISCOVERIES 2023 SUPPORT PREDICTIVE MODEL TO FIND NEW O&G RESERVOIRS - VIM-SSJ-COLOMBIA. (PART C)

EDINSON ALVAREZ GEOSCIENTIST (Modified ANH 2022). PRESENTED TO ECOPETROL JUL-2022



O&G AREAS OF INTEREST PROPOSED BY ANH FB22

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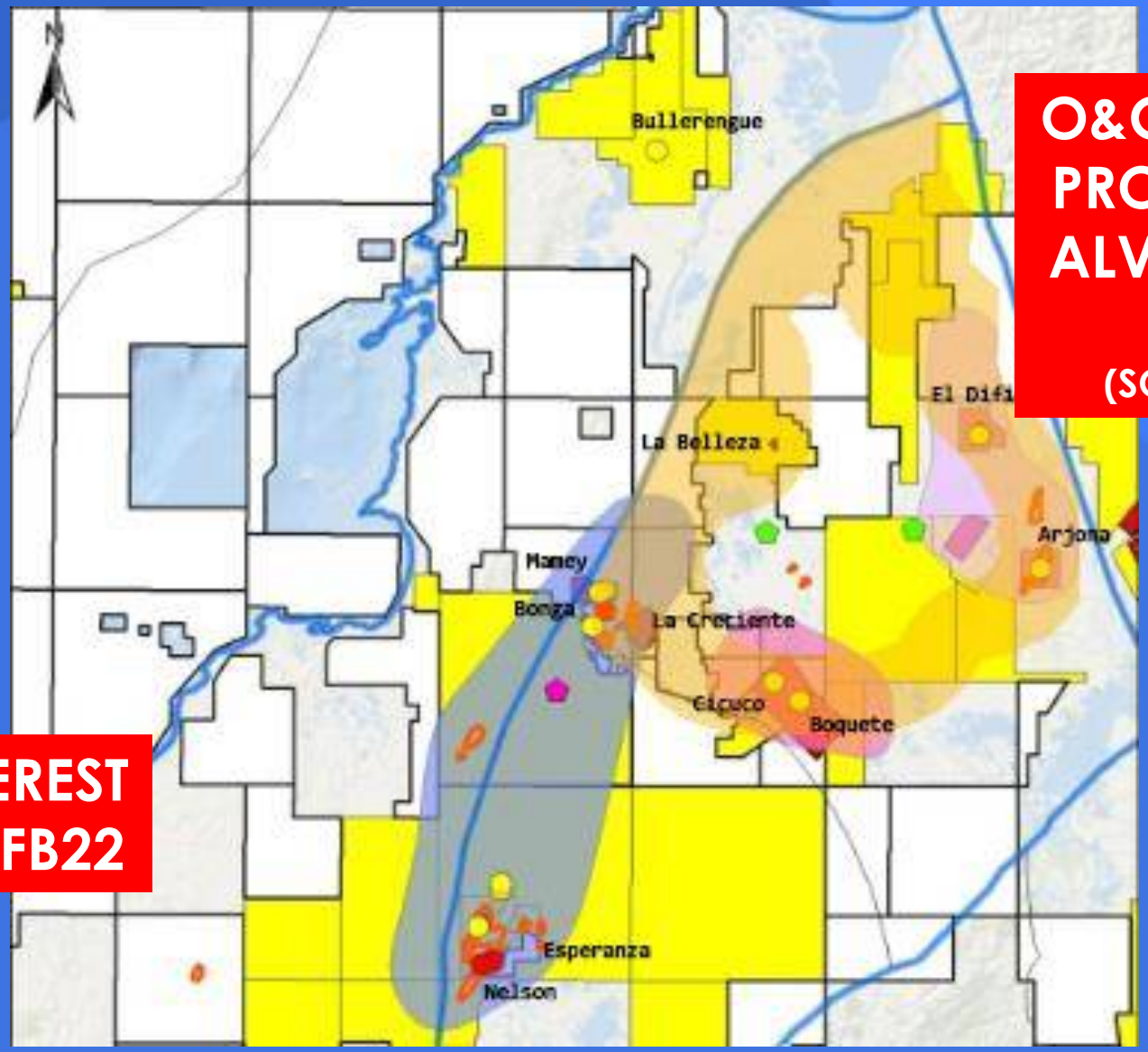

O&G AREAS OF INTEREST PROPOSED BY EDINSON ALVAREZ-GEOSCIENTIST NORTH AREA

(SOUTH AREA IN FULL REPORT)

O&G AREAS OF INTEREST PROPOSED BY ANH FB22

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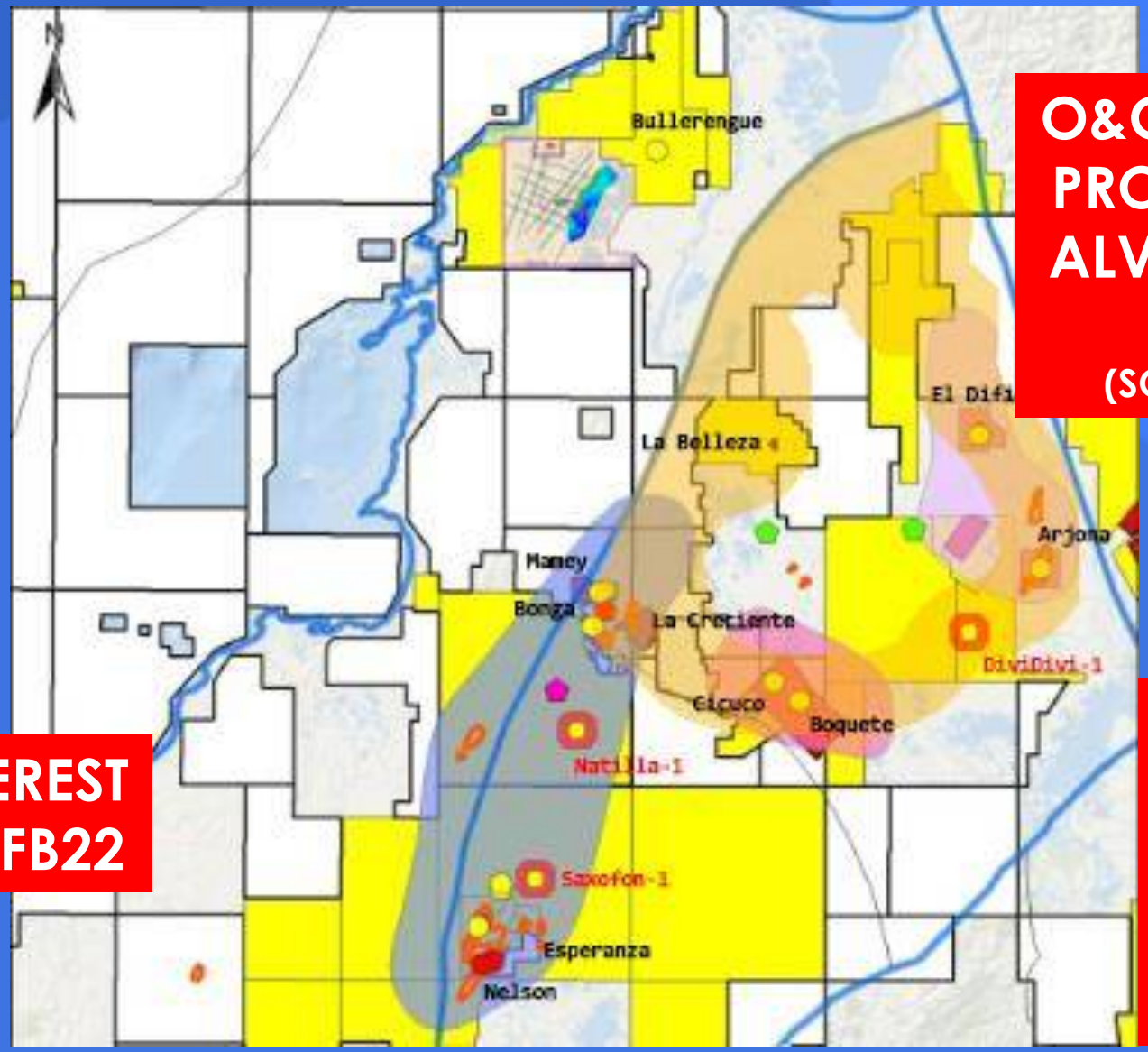

O&G AREAS OF INTEREST PROPOSED BY EDINSON ALVAREZ-GEOSCIENTIST NORTH AREA
(SOUTH AREA IN FULL REPORT)

O&G AREAS OF INTEREST PROPOSED BY ANH FB22

DIVIDIVI-1,NATILLA-1,SAXOFON-1 ANNUNCED DISCOVERIES O&G BY CANACOL ENERGY JANUARY 2023.

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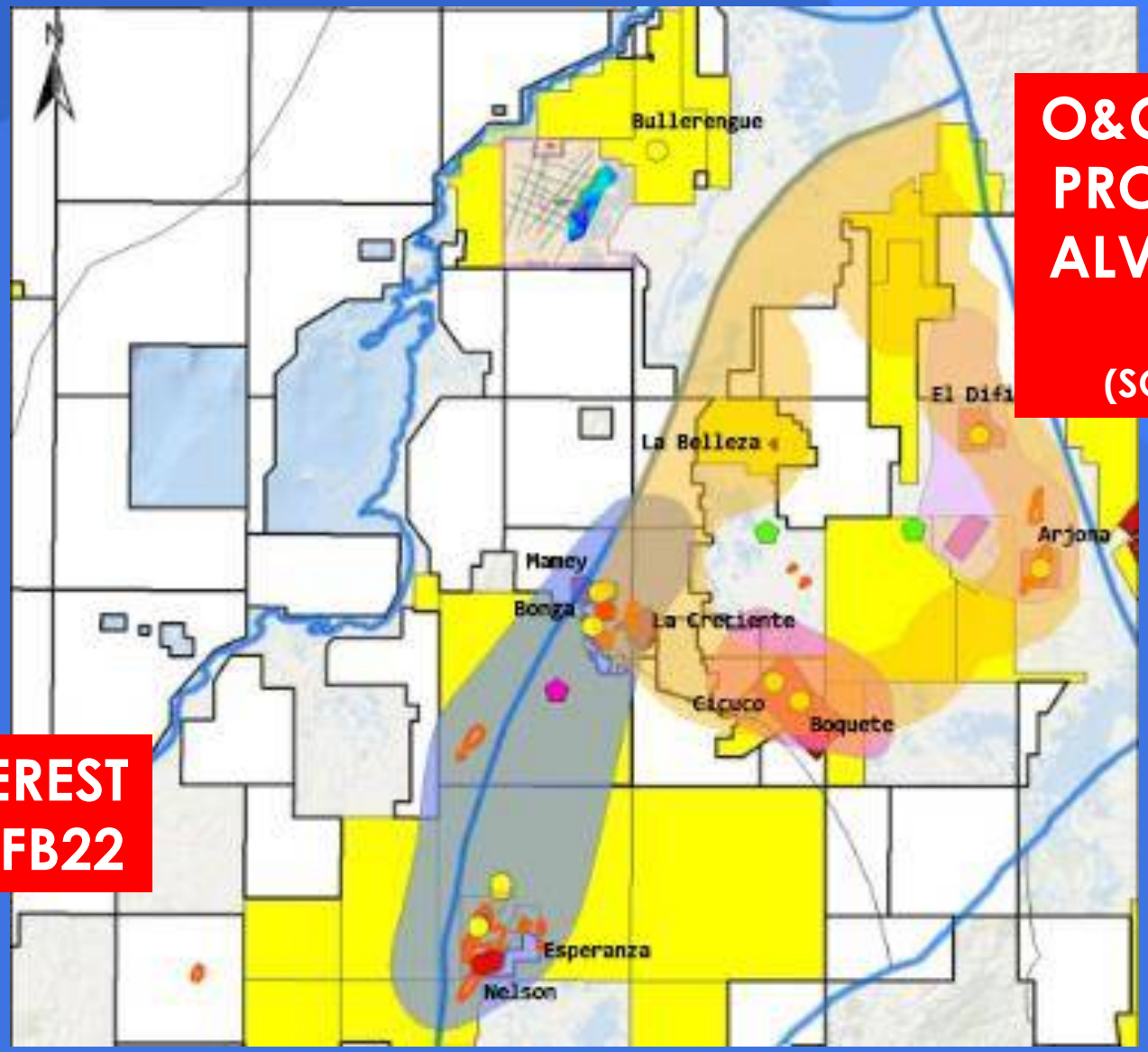

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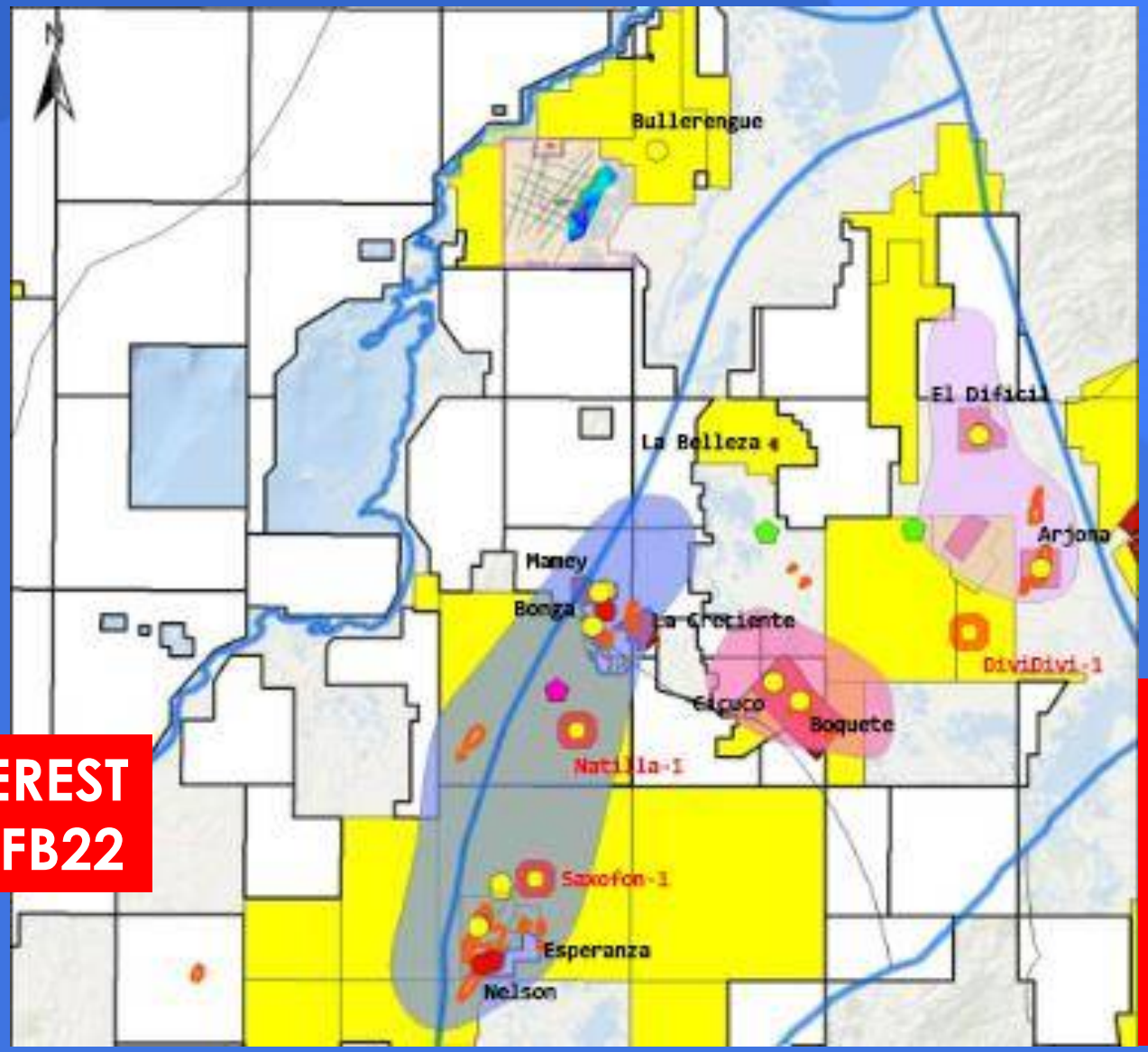

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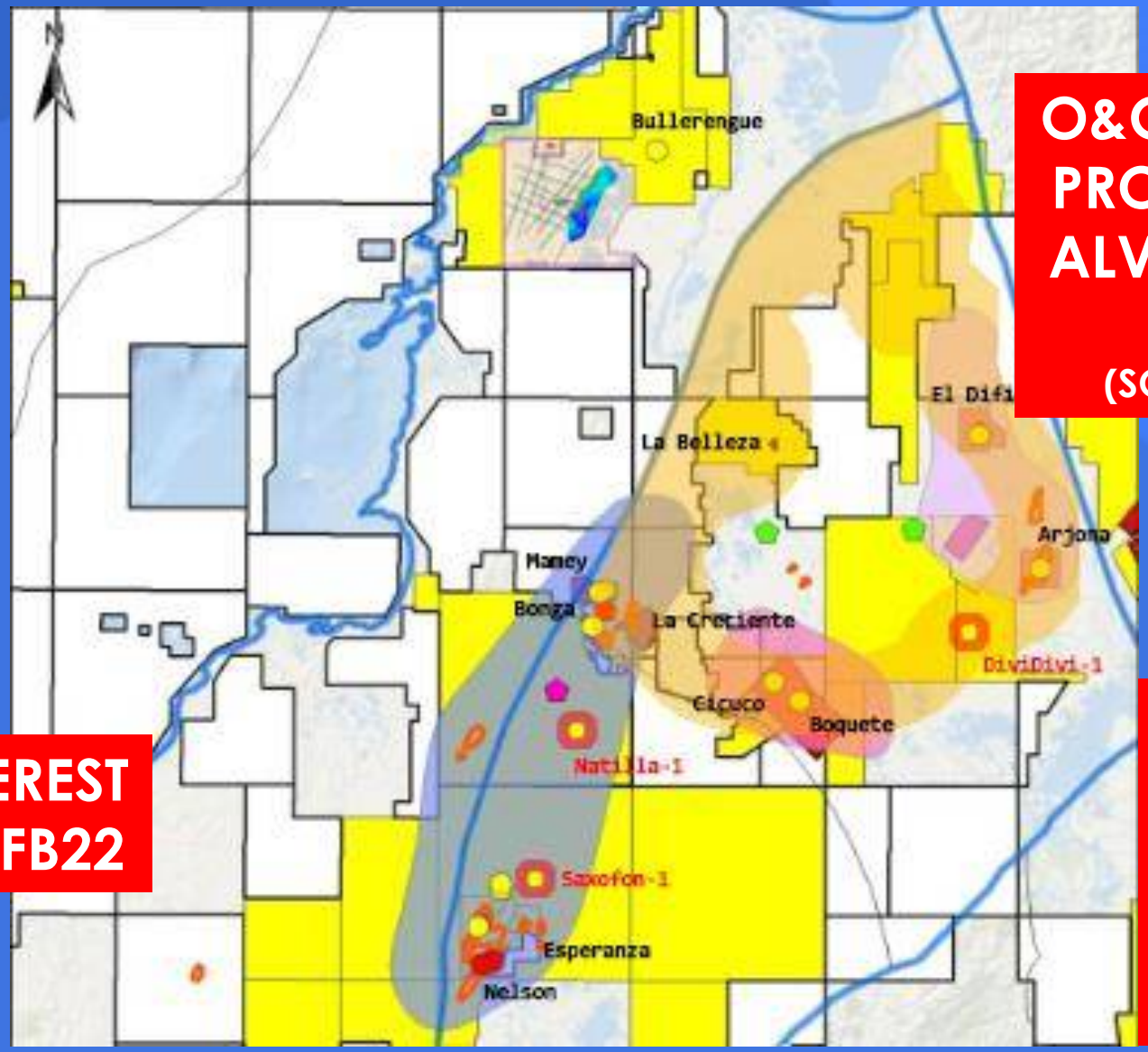

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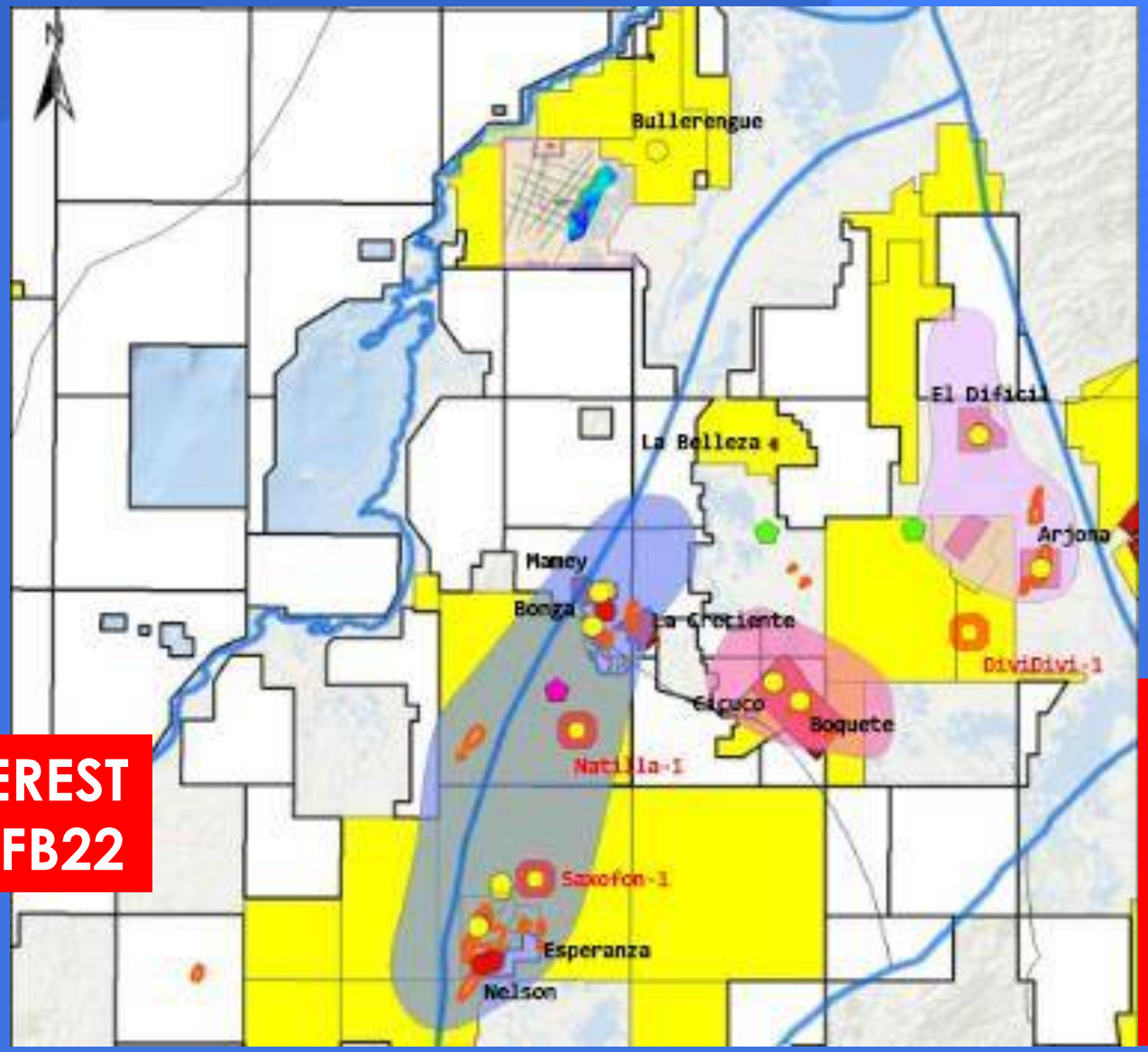

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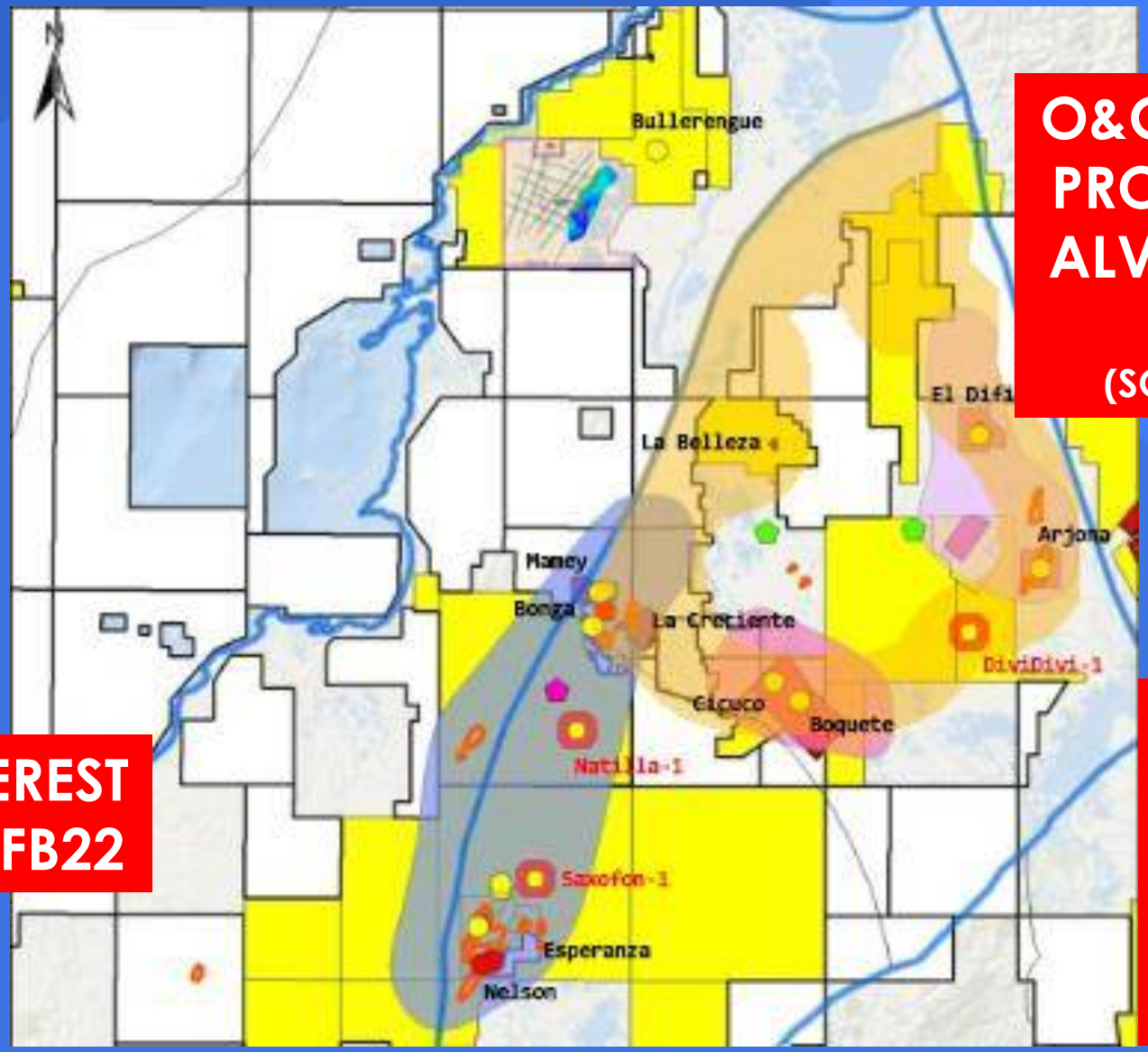

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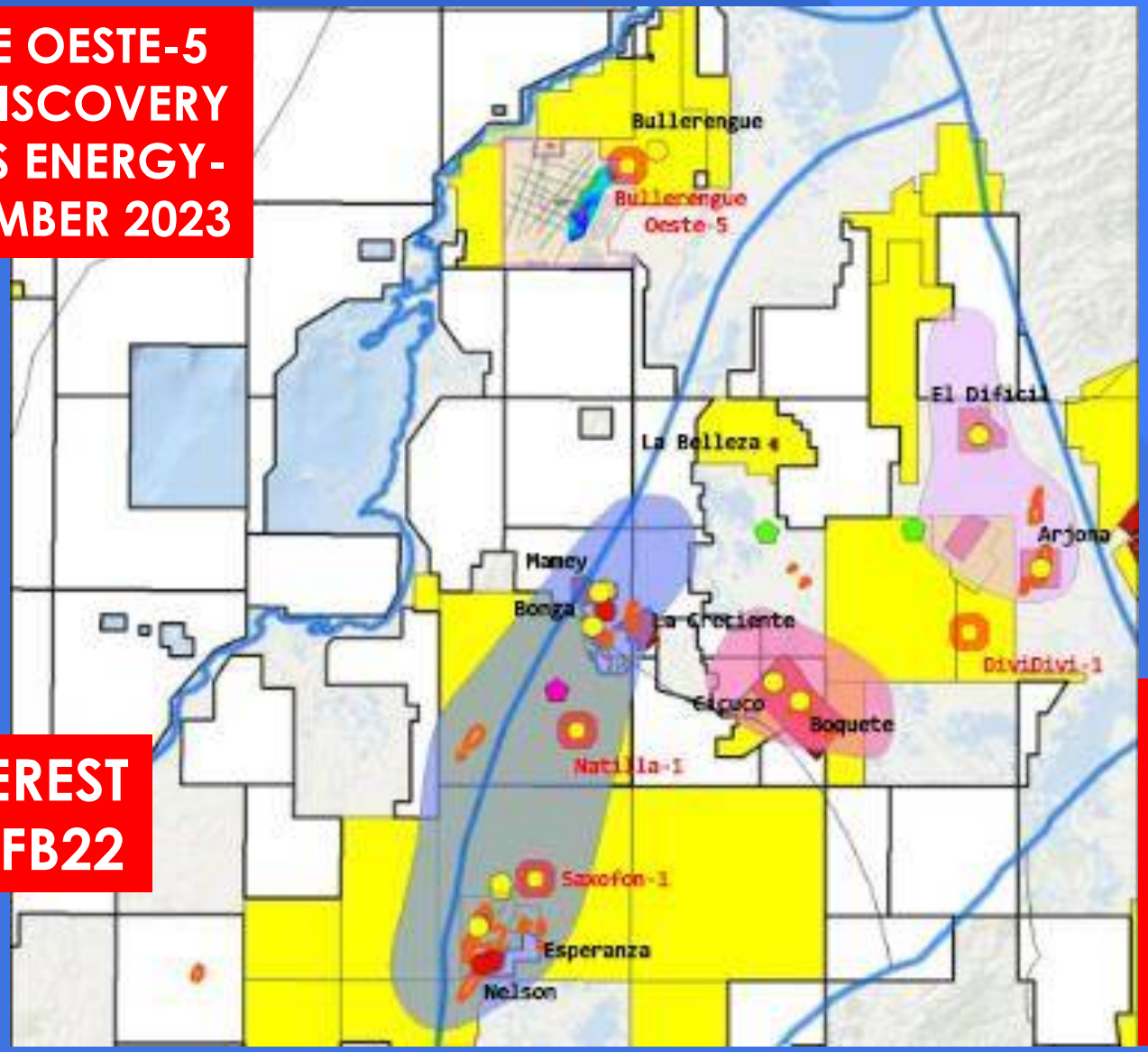
BULLERENGUE OESTE-5 ANNUNCED DISCOVERY O&G BY LEWIS ENERGY-HOCOL DECEMBER 2023



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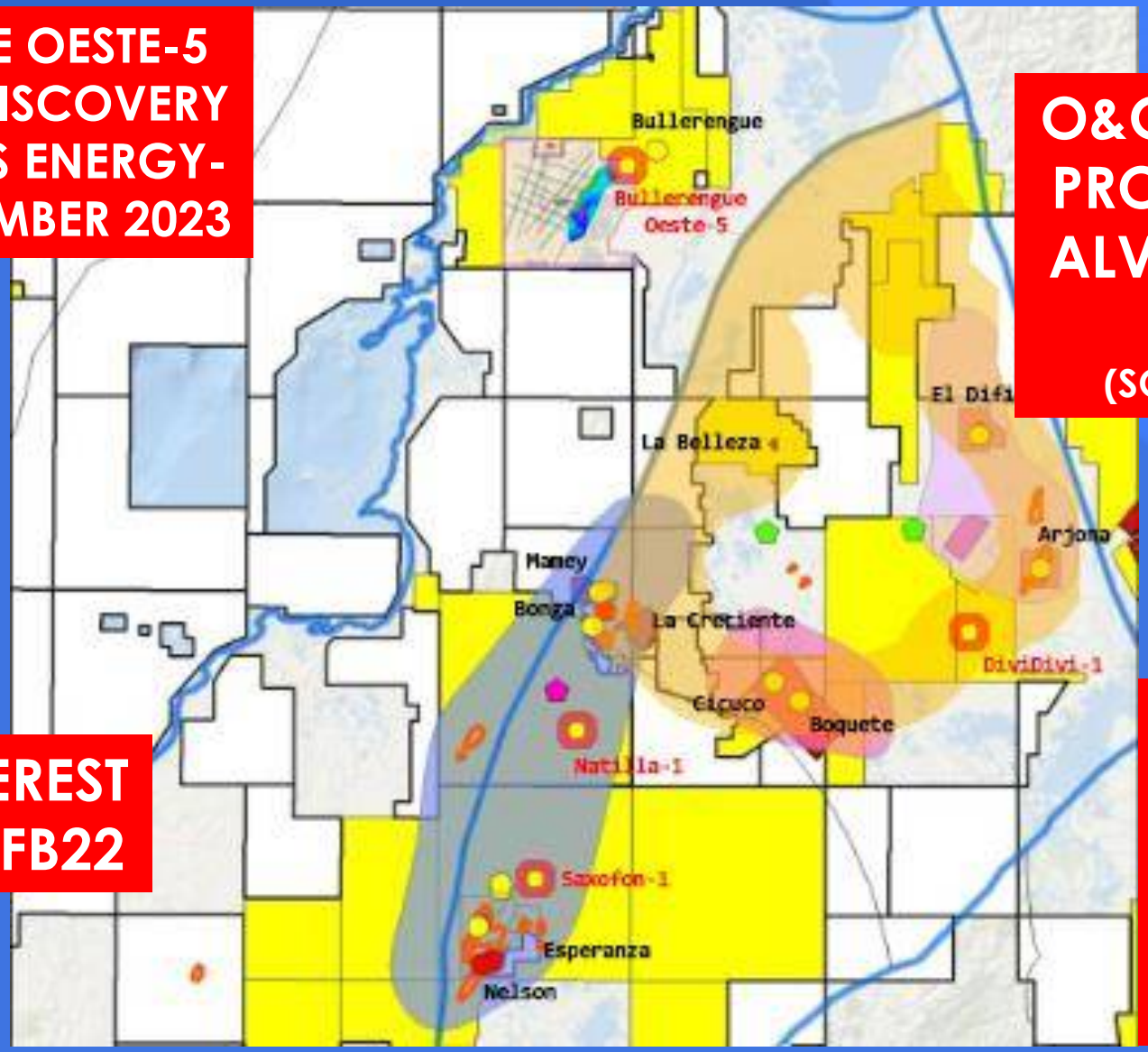

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O&G AREAS OF INTEREST PROPOSED BY EDINSON ALVAREZ-GEOSCIENTIST NORTH AREA+SSJ-JUL22
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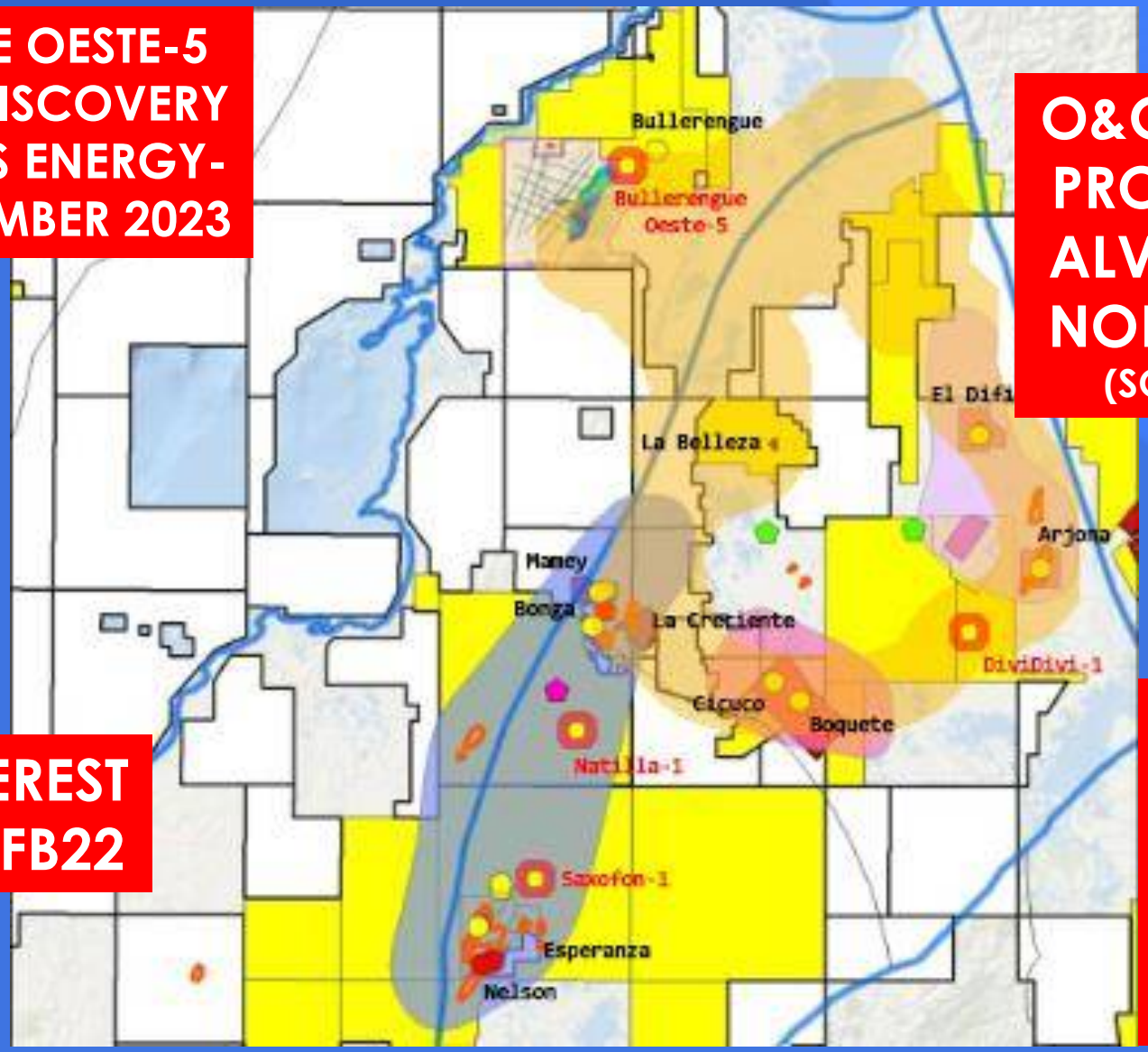

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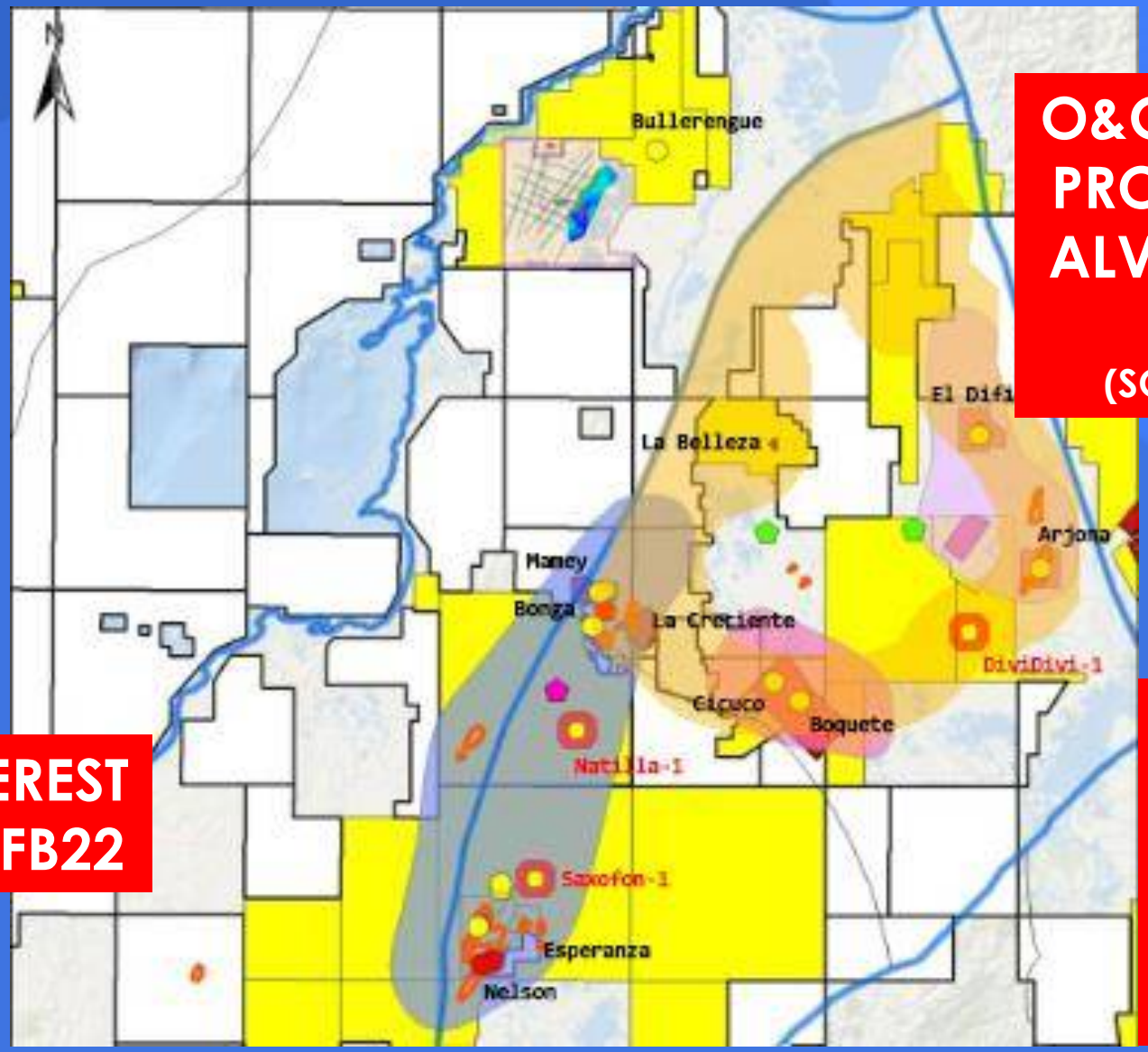

O&G AREAS OF INTEREST PROPOSED BY EDINSON ALVAREZ-GEOSCIENTIST NORTH AREA
(SOUTH AREA IN FULL REPORT)

O&G AREAS OF INTEREST PROPOSED BY ANH FB22

DIVIDIVI-1,NATILLA-1,SAXOFON-1 ANNUNCED DISCOVERIES O&G BY CANACOL ENERGY JANUARY 2023.

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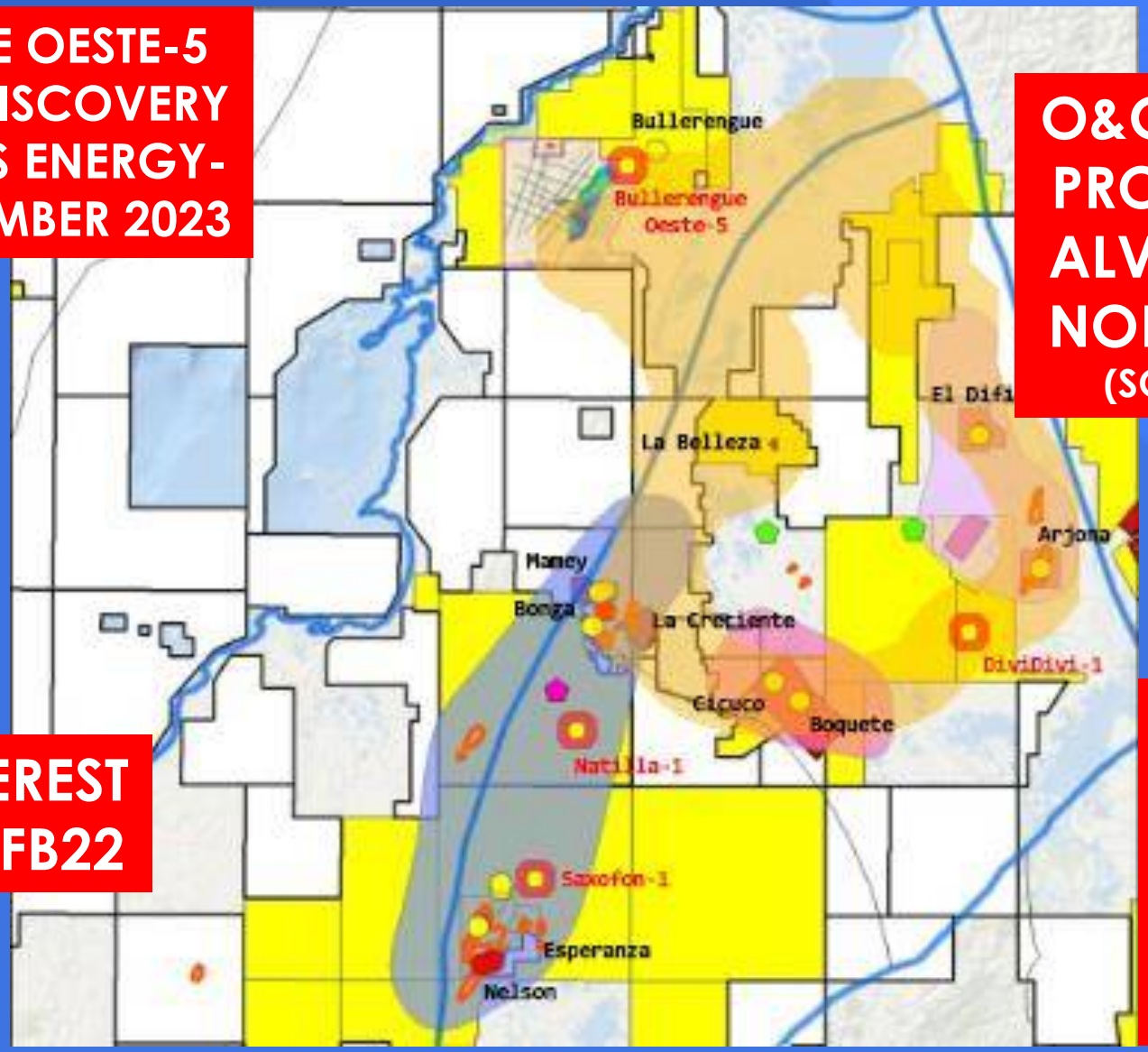
BULLERENGUE OESTE-5 ANNUNCED DISCOVERY O&G BY LEWIS ENERGY-HOCOL DECEMBER 2023



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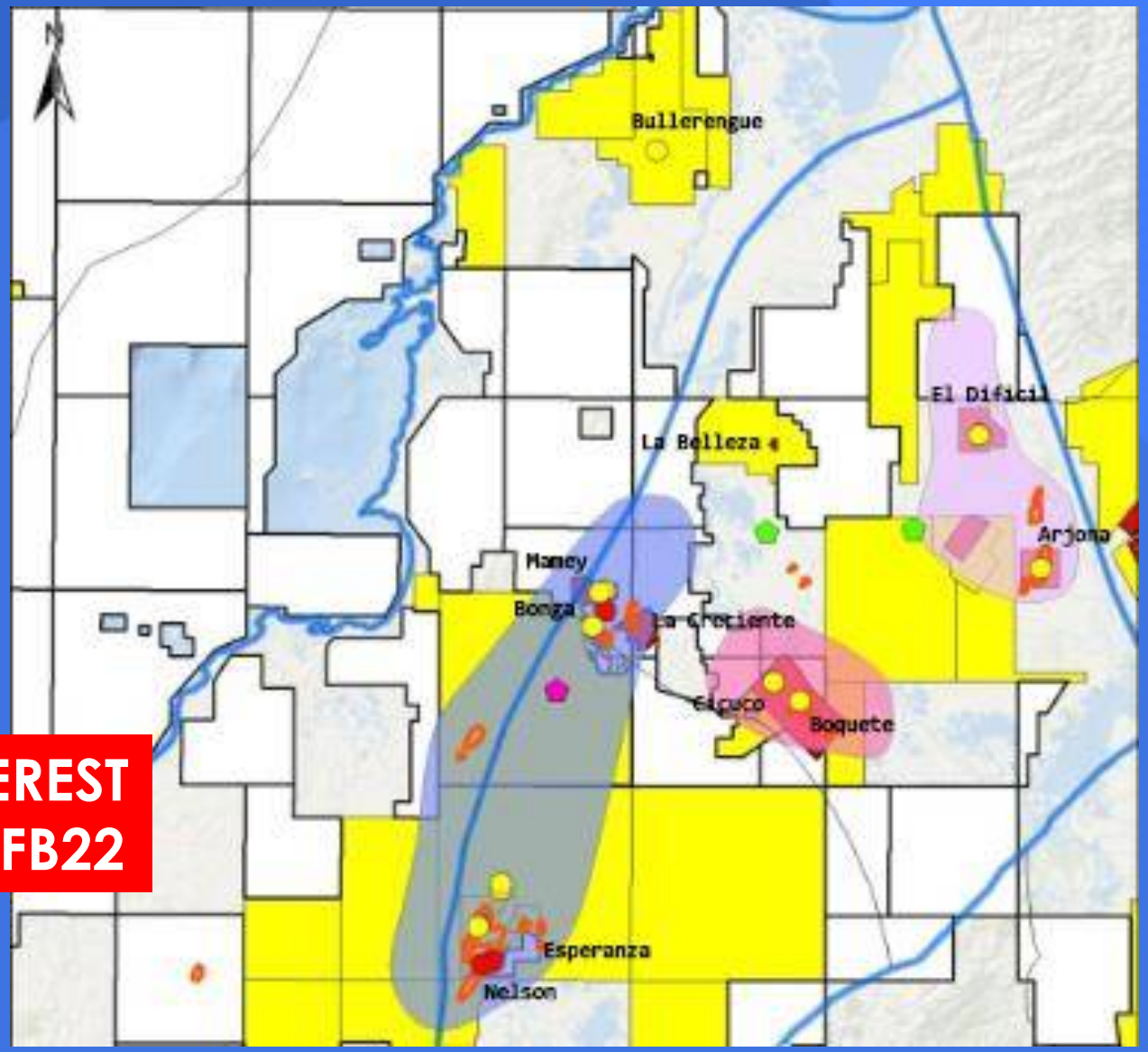

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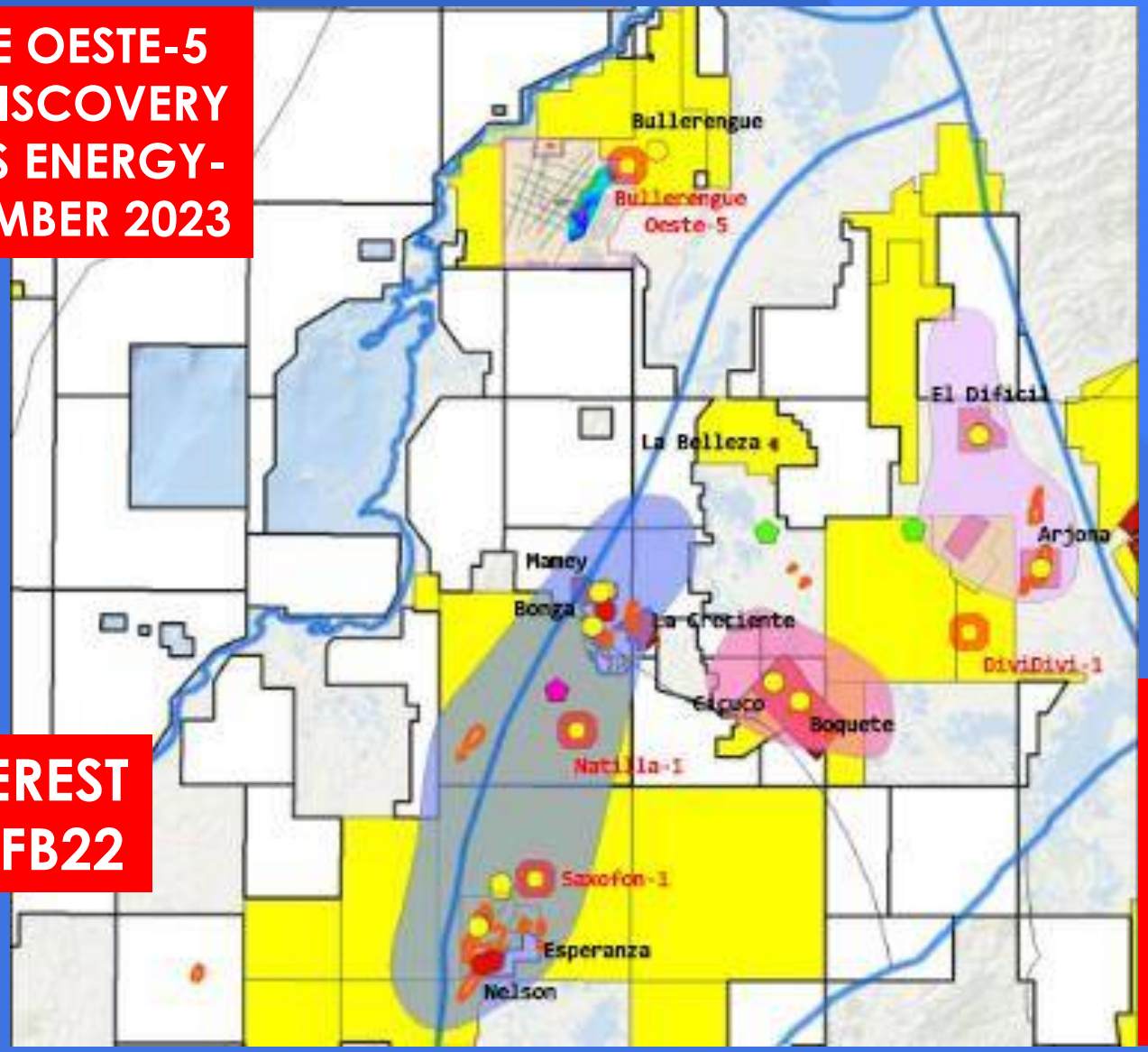

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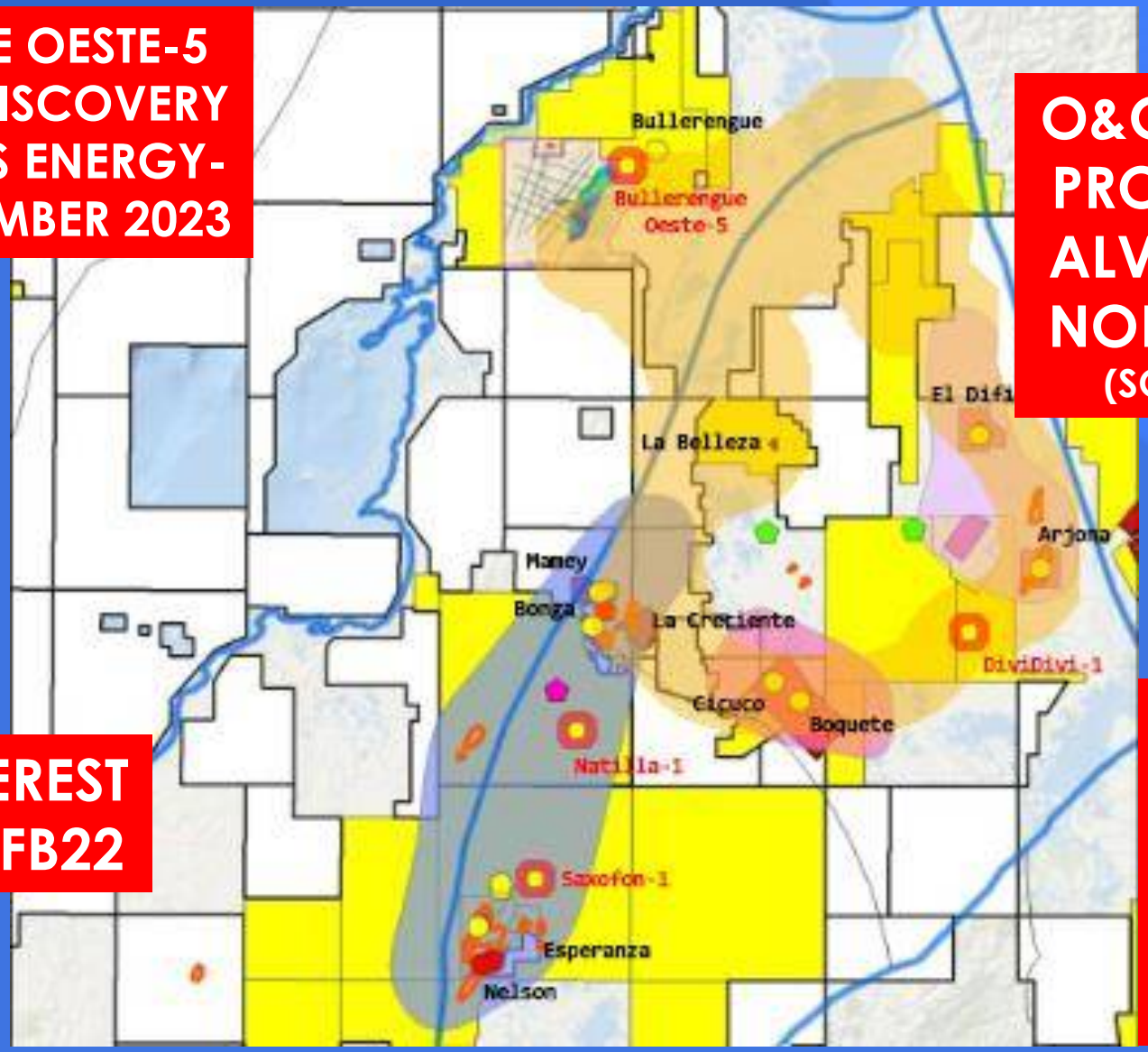

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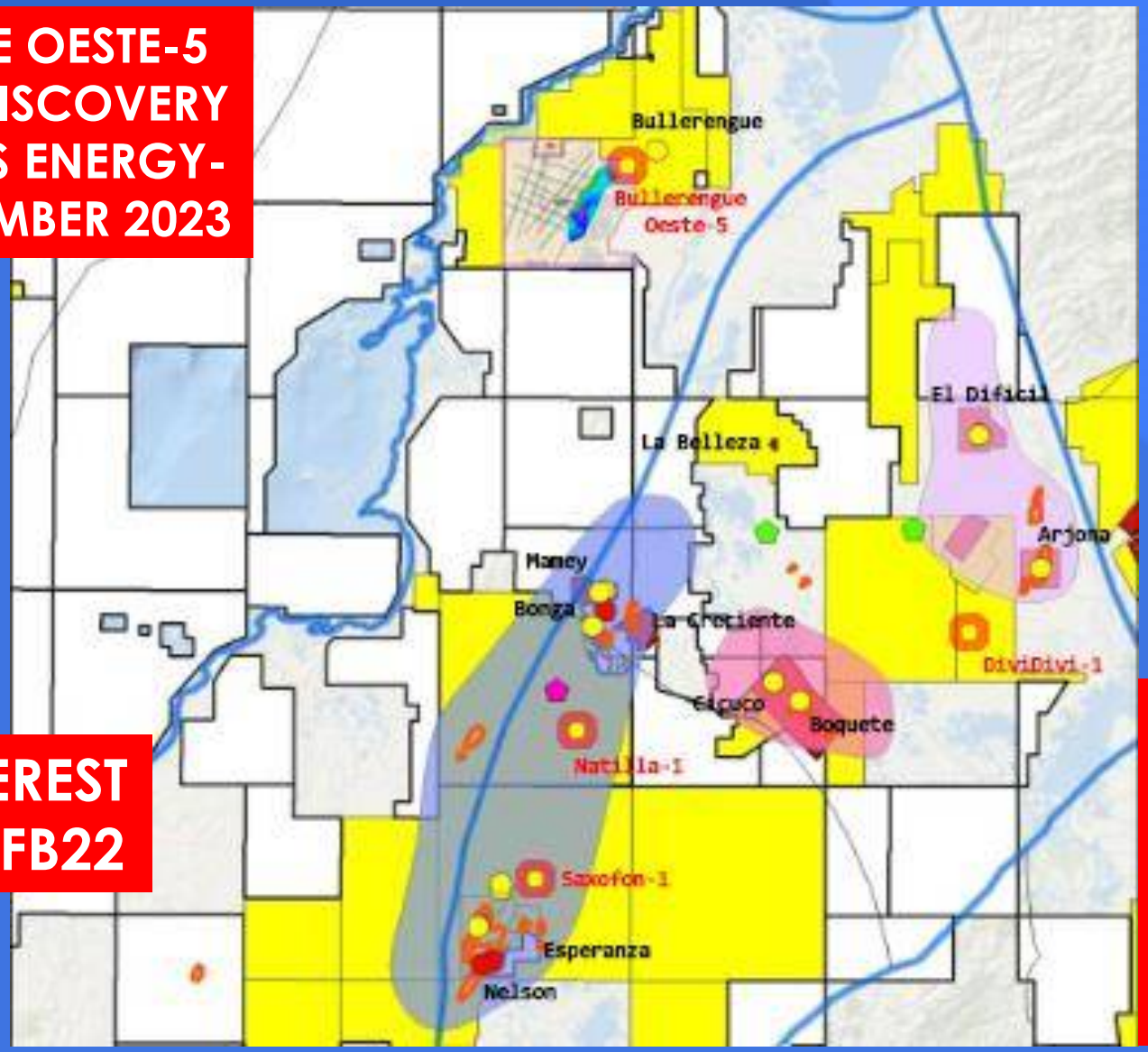

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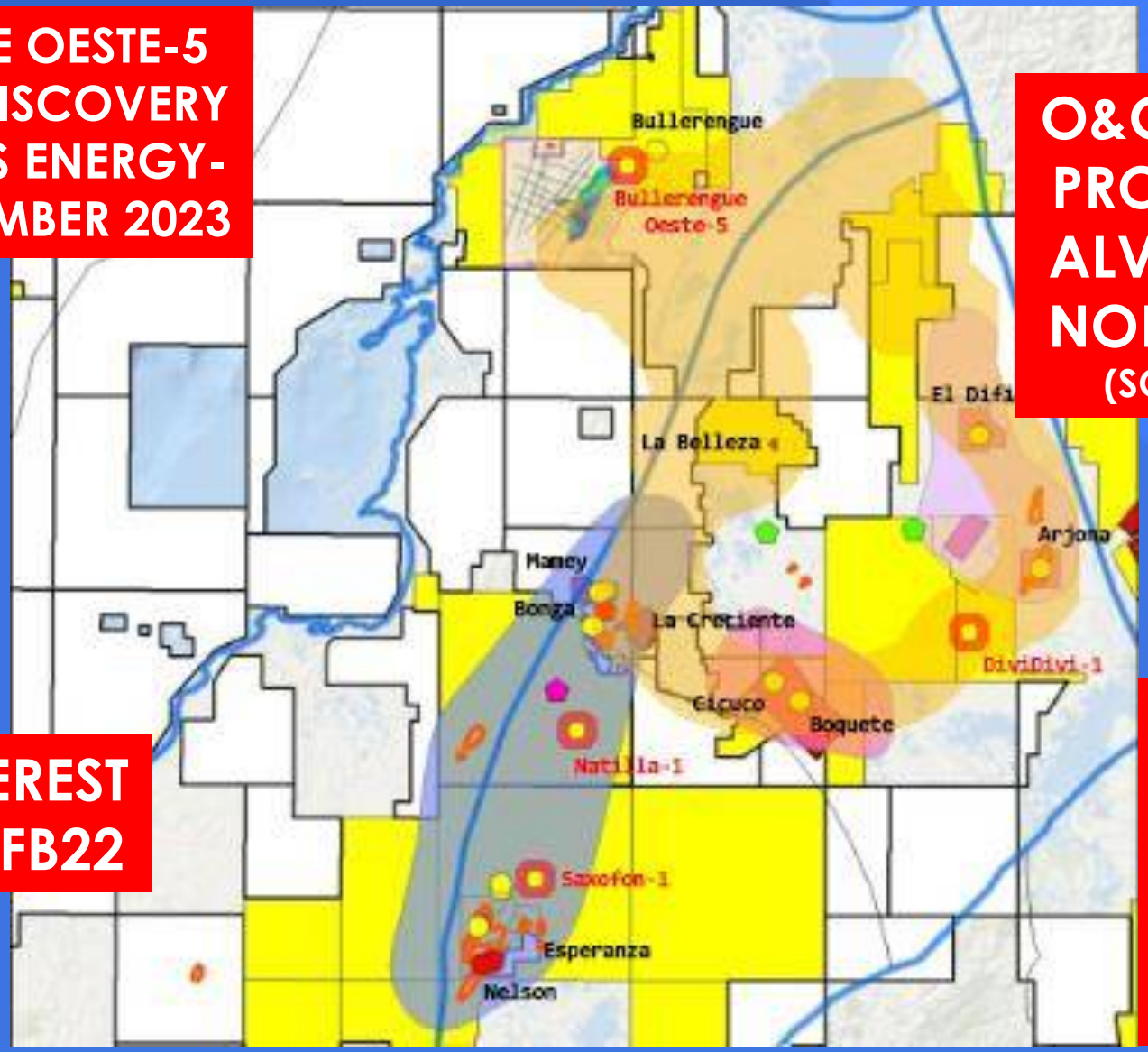

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CONCLUSION

CANACOL ENERGY'S DISCOVERIES 2023 SUPPORT PREDICTIVE MODEL TO FIND NEW O&G RESERVOIRS - VIM-SSJ-COLOMBIA. (PART C)

EDINSON ALVAREZ GEOSCIENTIST (Modified ANH 2022). PRESENTED TO ECOPETROL JUL-2022

1. THE PREMISE OF THE CONCLUSIONS OF THE DOCUMENT SENT TO ECOPETROL IN JULY-2022 (ITEM2) WAS FULFILLED:
   USING ADDITIONAL REVERSE ENGINEERING, SEQUENCE STRATIGRAPHY, WELL INTERPRETATION, GEOPHYSICAL, GEOLOGY AND STRUCTURAL INFORMATION OF THE BASIN, THE PRESENCE OF NEW FIELDS AND THE LOCATION FOR THE DRILLING OF NEW OIL WELLS WERE LOCATED WITH GREATER ACCURACY, AND DETAIL.
2. CANACOL ENERGY AND LEWIS ENERGY'S NEW DISCOVERIES HELP CONFIRM, STRENGTHEN AND TEST THE MODEL.
3. ALTHOUGH MANY WELLS TURNED DRY IN THE SECTOR, GLOBAL KNOWLEDGE AND ATTENTION TO DETAIL ARE THE KEY TO SUCCESS.
4. UNDERSTANDING THE OIL SYSTEM, AN EXTRAORDINARY FLOURISHING OF THE BASIN IS PROJECTED. MODEL TO APPLY AT THE STRATEGIC LEVEL BY THE COMPANY.
5. THE GRAY AREA IS OBVIOUS, BUT THE REST OF THE BASIN IS MISSING. YOU CAN FIND IT IN FULL REPORT. SOUTH AND OFFSHORE SSJ CORRIDOR NOT INCLUDED.