# Joint Technical Presentation On Guyana-Suriname Basin, Corentyne Block, and Integrated Well Results

# **DECEMBER 11, 2023**





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The term "boe" is used in this news release. Boe may be misleading, particularly if used in isolation. A boe conversion ratio of cubic feet to barrels is based on an energy equivalency conversion method primarily applicable at the burner tip and does not represent a value equivalency at the wellhead. The boe in Guyana is converted at 6 thousand cubic feet) to one barrel of oil.

Certain disclosures in this news release constitute "anticipated results" for the purposes of National Instrument 51-101 - Standards of Disclosure for Oil and Gas Activities ("NI 51-101") because the disclosure in question may, in the opinion of a reasonable person, indicate the potential value or quantities of resources in respect of the Joint Venture's resources or a portion of its resources. Without limitation, the anticipated results disclosed in this news release include estimates of volume attributable to the resources of the Joint Venture. Such estimates of anticipated results have been prepared or reviewed by an independent qualified reserves evaluator or auditor. Such terms should not be interpreted to mean there is any level of certainty in regard to the hydrocarbons present, or that hydrocarbons may be produced profitably, in commercial quantities, or at all. Anticipated results are subject to certain risks and uncertainties, including those described herein and various geological, technical, operational, engineering, commercial, and technical risks. Such risks and uncertainties may cause the anticipated results disclosed herein to be inaccurate. Actual results may vary, perhaps materially.



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#### Prospective Resources:

This presentation discloses estimates of the Joint Venture's prospective resources. Prospective resources are defined as those quantities of petroleum estimated, as of a given date, to be potentially recoverable from undiscovered accumulations by application of future development projects. Prospective resources are not, and should not be confused with, reserves or contingent resources. The prospective resource estimates contained in this presentation were made based on separate reviews by two independent, third-party qualified reserves evaluators, effective as of October 30, 2023, and November 30, 2023, respectively. Such estimates have been prepared in compliance with NI 51-101 and the Canadian Oil and Gas Evaluation Handbook. All estimates of prospective resources presented herein are on an un-risked basis, meaning that they have not been adjusted for risk based on the chance or discovery or the chance of development, and all volumes are presented on a gross basis, meaning the Joint Venture's aggregate working interest before adjustment for royalties. There is no certainty that any portion of the resources will be discovered. If discovered, there is no certainty that it will be commercially viable to produce any portion of the resources. Estimates of resources always involve uncertainty, and the degree of uncertainty can vary widely between accumulations/projects and over the life of a project. Readers are cautioned that the prospective resource potential disclosed in this news release are not necessarily indicative of ultimate recovery.

The resource estimates presented above are subject to certain risks and uncertainties, including those associated with the drilling and completion of future wells, limited available geological and geophysical data and uncertainties regarding the actual production characteristics of the reservoirs, all of which have been assumed for the preparation of the resource estimates. In addition, significant positive and negative factors related to the prospective resource estimate include the high exploration success rate of, and frequency of development projects by, operators in the Guyana-Suriname Basin, a lack of infrastructure and transportation in the Corentyne area and the capital expenditures and financing required to conduct additional appraisal activities and/or develop resources at an acceptable cost.

#### Analogous Information:

Certain information in this presentation may constitute "analogous information" as defined in NI 51-101. Such information includes reservoir information retrieved from government or other publicly available sources, regulatory agencies or other industry participants that are independent of Frontera and CGX. The Joint Venture believes the information is relevant as it may help to define the reservoir characteristics of certain lands in which the Joint Venture holds an interest. The Joint Venture is unable to confirm that the analogous information was prepared by a qualified reserves evaluator or auditor and is unable to confirm that the analogous information was prepared in accordance with NI 51-101. Such information is not an estimate of the resources attributable to lands held by the Joint Venture and there is no certainty that the resources data and commercial viability for the lands held by the Joint Venture will be similar to the information presented herein. The reader is cautioned that the data relied upon by the Joint Venture may be in error and/or may not be analogous to such lands held by the Joint Venture.



#### **ABOUT THE JOINT VENTURE**

CGX Energy Inc. (TSXV: OYL) ("CGX") and Frontera Energy Corporation (TSX: FEC) ("Frontera"), are joint venture partners (the "Joint Venture" or "JV") in the Petroleum Prospecting Licenses for the Corentyne block in offshore Guyana.

ABOUT



- CGX is a Canadian-based oil and gas exploration company focused on the exploration of oil in the Guyana-Suriname Basin and the development of a deep-water port in Berbice, Guyana.
- CGX is proud of its long partnership with the Government and People of Guyana and of its reputation as Guyana's indigenous oil company.





- Frontera is a Canadian public company involved in the exploration, development, production, transportation, storage and sale of oil and natural gas in South America, including related investments in both upstream and midstream facilities.
- Frontera has a diversified portfolio of assets with interests in 27 exploration and production blocks in Colombia, Ecuador and Guyana, and a pipeline and port facilities in Colombia.
- Frontera conducts its business safely and in a socially, environmentally and ethically responsible manner.



| CONTRACT TYPE                      | Petroleum Prospecting License |
|------------------------------------|-------------------------------|
| Gross acreage (1)                  | 245,735 in Corentyne          |
| W.I. IN CORENTYNE BLOCKS           | CGX 28%, Frontera 72%         |
| FEC equity ownership in CGX Energy | 76.05%                        |



#### **ABOUT THE PRESENTERS**



#### Dr. Mark Zoback

CGX Energy Board of Directors, Senior Technical Advisor Professor of Geophysics at Stanford University, Emeritus, author of two books on reservoir geomechanics. Founder and Chairman of GeoMechanics International (GMI), a consulting and software company sold to Baker Hughes in 2008.

#### **Regan Palsgrove**

Head of Exploration for Frontera Energy 33 years' experience in several North and SouthAmerican basins including with Chevron Canada,Talisman Energy and several smaller companies.6 years with Frontera Energy leading an explorationteam working in the Guyana-Suriname Basin.



### **HIGHLIGHTS**

#### Material Discoveries after Drilling of Kawa-1 and Wei-1

- Well results from Wei-1 and Kawa-1 together confirm the prospectivity of the Corentyne Block
- Proven oil charge and excellent reservoir in Maastrichtian justifies new focus
- Significant de-risking and growth of block prospect inventory

#### On Trend with Golden / Silver Lane Discoveries

- Contiguous to the ExxonMobil operated Stabroek Block and the Total operated Block 58
- Northern area is on trend with the significant discoveries in both blocks

#### Maastrichtian Volumes Underpin Potential Commercial Development

- Maastrichtian Prospective Resource<sup>1</sup> estimated to be 514 628 mmboe (Pmean unrisked), evaluated independently by two world class resource evaluators
- Lower drilling time & cost of Maastrichtian wells favorable for potential commercial development
- Conceptual development plan prepared with Subsea 7 and SLB

#### Considerable upside and potential for future development in deeper intervals

- Deeper Campanian and Santonian intervals offer material additional prospectivity
- Moveable hydrocarbons proven in the Campanian, with easily mappable, thick channel sands

**Prospective Resources** are those quantities of petroleum estimated, as of a given date, to be potentially recoverable from undiscovered accumulations by applying future development projects. Prospective Resources have both an associated Chance of Discovery and a Chance of Development. Prospective Resources are further categorized according to the level of certainty associated with recoverable estimates assuming their discovery and development and may be sub-classified based on project maturity.



# **CORENTYNE BLOCK- OVERVIEW**

#### **Recent Block Activity**

- Frontera Energy (72%) and CGX Energy (28%), together the "JV Partners", jointly hold 100% working interest in the Corentyne Block, located in the highly prolific Guyana-Suriname basin
- Two wells drilled, targeting stacked channels across multiple reservoir horizons
  - Kawa-1 (TD Jan-22) well encountered hydrocarbonbearing reservoirs within the Maastrichtian, Campanian, Santonian and Coniacian intervals
  - Wei-1 (TD Jun-23) well encountered hydrocarbonbearing reservoirs within the Maastrichtian, Campanian and Santonian intervals
  - Comprehensive data acquisition program Wei-1 enabled re-evaluation of Kawa-1
- Maastrichtian resource assessment completed by two independent, 3<sup>rd</sup> party world-class resource evaluators
- Conceptual development plan, underpinned by Maastrichtian volumes, prepared with Subsea 7 and SLB

#### Highlights Map





# **CORENTYNE BLOCK- CONVERGENCE OF THE GOLD AND SILVER LANES**



1. GEOExPro Vol.19, No. 1, 2022

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# **EXPLORATION RESULTS**









# **IMPLICATIONS OF THE RESULTS OF THE DRILLING PROGRAM**

This was a **two-well drilling program**, and results from both wells were required to determine a forward plan.

- Kawa-1 found hydrocarbons in many different layers, but insufficient data acquisition prevented full evaluation of reservoir quality and fluid types
- Data from Wei-1 provided enough data to evaluate itself, as well as Kawa-1 and the prospects in between
- Comparisons could be made between the prospective horizons in the wells

The Maastrichtian in North Corentyne has:

- ✓ Favorable geologic setting- surrounded by Golden Lane discoveries
- ✓ Thick blocky sands; seen in Kawa-1
- ✓ Mappability, as evidenced at Kawa-1
- ✓ Excellent reservoir quality; seen in Wei-1
- ✓ Oil charge; as recovered in Wei-1
- ✓ Abundant follow-up opportunities
- ✓ Large potential recoverable resource
- ✓ Quicker, easier drilling in both wells

Together these facts led us to refocus our effort on the Maastrichtian.

The JV now believes the Maastrichtian has the potential for a stand-alone commercial development, with upside and future opportunities in the deeper zones.



# **FOCUS ON MAASTRICHTIAN**

The results of Kawa and Wei-1 have derisked many compelling Maastrichtian anomalies on the block



# **MAASTRICHTIAN- FAVORABLE GEOLOGIC SETTING**

#### Compilation of seismic lines through Corentyne Block



**Corentyne Block is in the Golden Lane** 

#### Maastrichtian Depositional Environment



- During the Maastrichtian, sand was brought downslope and deposited onto the basin floor in the Corentyne and Stabroek Blocks
- North Corentyne is in the same setting on the basin floor as the Golden Lane Discoveries in Stabroek Block
- The Golden Lane is not just a trend on a map- it is also an interval that is consistently prospective in the Basin- the Maastrichtian/Upper Campanian, where the JV also sees the most potential in North Corentyne.

# **MAASTRICHTIAN- THICK SAND PACKAGES IN CORENTYNE BLOCK**



# The potential for thick reservoir development is evident at Kawa-1

- Several stacked blocky sands over 600-foot interval; mappable sand package
- High Net-to-Gross sand ratio
- Blocky sands up to 60 feet thick
- Good reservoir quality on logs
- 16 26% porosity

100 feet

• 68 feet pay combined log pay

Significant potential resource already penetrated in Kawa-1



### **MAASTRICHTIAN- MAPPABLE AND PREDICTABLE**

Perspective diagram of two intersecting seismic lines and a map of a Maastrichtian horizon. This is displaying just one of many horizons in the Maastrichtian.



Sand: green and yellow Shale: are blue

#### Mapping Methodology

- Extensive core and log dataset from Wei was used to calibrate with seismic to create predictive models of reservoir development
- Various "attributes" of seismic were examined to determine which attribute most closely matches the rock types seen in Kawa and Wei
- Seismic can be used to predict where sand and shale are present away from the wellbore.
- This is a "seismic attribute" map of one horizon within the Maastrichtian. Maps were built on many horizons within the Maastrichtian to identify sandy prospective areas for further analysis.
- After generation of seismic attribute maps, sedimentological models were built to put seismic anomalies in context



# **INTEGRATED MAPPING- SEISMIC AND DEPOSITIONAL ENVIRONMENT**

Seismic and geologic maps highlight a large channel complex penetrated by Kawa-1 and associated with the Maastrichtian pay sands





- Depositional fairway associated with Kawa pay sands mapped with VpVs extraction and depositional modelling; this represents top of interval
- Kawa Pay sands interpreted as "levee sands" in "Channel Levee Complex" in a submarine deepwater system within the Golden Lane trend
- Kawa-1 associated with large potential resource (prospect area outlined)
- Additional sands in Central Area at this horizon

Integrated mapping provides context to seismic and highlights prospectivity



# **MAASTRICHTIAN- MAPPING POTENTIAL AT MANY HORIZONS- CENTRAL AREA**

- This layer is just a little deeper in the Maastrichtian than the previous map
- Like the previous map, depositional fairway mapped with VpVs extraction and depositional modelling
- Unpenetrated
- Additional sands in Central Area at this horizon



Maastrichtian prospects identified and many different horizons and all across the block



# **MAASTRICHTIAN- EXCELLENT RESERVOIR QUALITY**

The potential for excellent reservoir development is evident at Wei-1, where Maastrichtian sidewall cores were obtained

- Clean
- Quartz-rich
- Medium to coarse grained
- Moderate sorting
- 23%+ core porosity
- ~1 Darcy core permeability





Thin Section Analysis



**Excellent reservoir** can be expected elsewhere on the block



### **MAASTRICHTIAN- OIL CHARGED**

Medium Sweet Oil from Wei-1 Maastrichtian



#### **Oil Characteristics**

- 24.9 API
- ~380 GOR

- Log pay in Maastrichtian in Wei-1
- Similar hydrocarbon show as Kawa-1
- MDT samples recovered and analyzed at lab
- Sampled fluid was Black Oil

| ROP / Gamma Ray  |   | Lithology |         | Gas Chromatograph |           |            |        |
|--|---|-----------|---------|-------------------|-----------|------------|--------|
| -  |   |           |         |                   | <u>10</u> | C1 (ppm)   | 100000 |
| 0  | Total Gas (%)   | 20        |         |                   | 10        | C3 (ppm)   | 100000 |
| 200  | ROP (ft/hr)   | 0         |         | DSS               | 10        | iC4 (ppm)  | 100000 |
| 5  | Bit Size (in)   | 30        |         | Ę                 | 10        | nC4 (ppm)  | 100000 |
| 5  | Caliper (in)  | 30        | Depth   | цар<br>Цар        | 10        | iC5 (ppm)  | 100000 |
| 0  | Gamma Ray (api)   | 150       | (ft MD) | Dep               | 10        | nC5 (ppm)  | 100000 |
| Bit No: 4<br>Made: 2547<br>In: 81.92<br>Bit Run: 8<br>Bit No: 5<br>Make: HA<br>Bit Type: (<br>Size: 14 3 | 7.0 E Beat 201 Mad<br>[27 Feb 30] 28 Feb 201 [n: 0<br>EP 20 Feb 30] 28 Feb 201 [n: 0<br>EP 21 Feb 30] 28 Feb 30] | VO: 4RR   | 15400   | -15300            |           | FG: 11.48% | 1.13%  |
| WOB: 21.4<br>TRQ: 15.8   | klbs  | WW        |         |                   | Man A     | 1          | ~~~    |

Example from Wei-1 mud log

- Log pay in Maastrichtian in Kawa
- Good hydrocarbon shows in mud, including "heavy" components indicative of possible oil
- No MDT samples



Example from Kawa-1 mud log

Information from Wei-1 indicates Kawa-1 is Oil Charged



### **MAASTRICHTIAN- PROSPECT INVENTORY FOR DEVELOPMENT PLAN**



- Multiple Maastrichtian prospects and leads, currently focused in North Corentyne area
- Maastrichtian prospects and leads stack for multi-zone potential
- Maastrichtian Prospective Resource in North Corentyne estimated to be 514-628 mmboe (Pmean unrisked); evaluated separately by two independent, third-party world class resource evaluators
- Resource evaluation only considered high-graded Maastrichtian prospects on the retained land; no deeper prospects included

Large Maastrichtian potential resource and potential for stand-alone development



### **WEI-1 DEEP ZONES**

- Wei-1 results proved geological and geophysical models; thick packages of clean sands with indications of hydrocarbons were penetrated
- Log Porosity was reasonable, but high amounts of clay indicated lower permeability; this was confirmed later with core analysis
- In Lower Campanian, sands were tighter than hoped, with permeabilities generally less than 1 -2 mD in limited side wall core data set, and mildly better, ~ 6mD, based on MDT interpretation.
- In Santonian, permeability was lower still, often less than 1mD, but was a very thick package of stacked sands with high Net-to-Gross sand ratio

Deep upside for possible future development

#### LOWER CAMPANIAN

Thick blocky sand, well imaged on seismic; hydrocarbon fluid sampled on MDT from 2 sands, analyzed downhole, sample not recovered. Combined 61 ft log pay, mostly average porosity 14%, lower permeability, 1 to 6 mD



#### UPPER SANTONIAN

Stacked blocky sands, 22 ft log pay, 14% porosity, low permeability, <1 to 1 mD; oil shows throughout



#### LOWER SANTONIAN

Thick package of thick and thin bedded sands, 18 feet pay, 13 to 16% porosity, with low permeability, <1 to 2mD; no MDT samples but oil shows throughout

100 feet scale same for all displayed logs



# WEI-1 LOWER CAMPANIAN

Wei targeted and penetrated a thick Lower Campanian channel complex



#### Wei-1 Lower Campanian:

- Thick contiguous blocky sand, frequently thinly interbedded
- 61 feet pay primarily in lower sand, pay top to bottom, 14% • average log porosity in pay zones. MDT interpretation indicated permeability up to ~6mD
- Two side wall cores recovered and analyzed
- Fluid sampled on MDT and analyzed downhole; tool stuck while testing, samples lost

#### Wei-1 Lower Campanian 61 feet log pay

Intege facies & gamme-ray bounding the

Image

Log



of log interval

analyzed core

Lower Campanian sand is well developed at Wei-1 and illustrates potential for other mappable sand channel sequences across the block

Blocky sand is actually very thinly interbedded throughout: image below from "sandiest" part of blocky sand indicates scale of bedding





# **WEI-1 LOWER CAMPANIAN- DEPOSITIONAL INTERPRETATION AND MAPPING**

Seismic and geologic maps highlight a large channel complex penetrated by Wei-1 and associated with the Lower Campanian pay sands





- Depositional fairway associated with Upper Campanian pay sands in Wei mapped with VpVs extraction and depositional modelling
- In this interval, the Wei-1 well penetrated a thick blocky sand (59 ft thick) and some thinner sands in a 250 ft thick zone, validating model
- Wei pay sands interpreted as part of a "Channel Complex" in a submarine deepwater system
- Wei-1 results and integrated mapping indicates good potential upside across the block
- Additional unpenetrated sandy channel complexes in Lower Campanian at this horizon and in additional deeper horizons

Integrated mapping provides context to seismic and highlights prospectivity



# **WEI-1 SANTONIAN**

Wei targeted and found a thick section of Santonian channel complexes



#### See box on seismic line for approximate position of log interval

#### Wei-1 Santonian

- Very thick sequence of stacked sands and shales, 40 feet combined pay
- Thick blocky pay sand at top, easily mapped; stacked sands & shales below
- 40 feet pay, 13 16% average log porosity in pay zones
- Cores had many hydrocarbon shows, including bleeding oil from fractures
- 17 analyzed side wall cores
- Heterogeneous rock types and reservoir quality; very fine to very coarse sand and breccia
- Overall pay count low due to generally high clay content





### **MAASTRICHTIAN- CONCEPTUAL DEVELOPMENT PLAN**



#### Subsea Well Completions tied back to FPSO

JV Partners retained SIA, a Subsea 7 – Schlumberger (OneSubsea) Joint Venture, to complete a conceptual field development plan for the northern portion of the Corentyne Block.

The conceptual field development plan has addressed:

- Optimization of subsea architecture
- Development well planning
- Production and export facilities
- Other considerations, including optimization of capital structure through leasing options, and drilling learning improvement

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# **TIMELINE TO FIRST OIL**

- The Joint Venture has initiated the appraisal phase.
- Subsequent to appraisal, the project will pass the select, define, execute and operate stage gates shown below.
- First oil date is prognosed as 2030, seven years after discovery with Final Investment Decision (FID) in 2026.
- Post FID, construction of topsides (FPSO), drilling, completion, and subsea architecture are commenced in execute phase
- Optimization may reduce seven-year discovery (2023) to First Production (2030) timing.
- Discovery to first oil timing in neighboring Stabroek block:
  - Liza I: 4 years
  - Liza II: 6 years
  - Payara: 6 years



# **KEY MESSAGES**

CGX and Frontera's successful two well drilling campaign has "filled the gap" in the prolific Gold and Silver Lanes.





Surrounded by discoveries

In the right setting in the Golden Lane



, Thick sands



Medium sweet oil

Abundant opportunities



Potential for standalone development An estimated **514 to 628 mmboe** of Prospective Resource (Pmean unrisked) lies in the Corentyne Block in the highgraded Maastrichtian prospects, including some that has already been penetrated.

This resource underpins a potential commercial development in the Maastrichtian.

Block potential is bolstered by more potential in additional leads in the Maastrichtian, several of which are overlapping.

Upside also remains in lower permeability, but thick, laterally extensive deep zones; which could be a material addition in future development.





# Q&A Section

