

CONTRACT FOR SERVICES

Preparation of a Feasibility Study on the Applicability of Seismic Methods for CO₂ Plume Monitoring

Česká geologická služba (Czech Geological Survey)

Registered office: Klárov 131/3 ,118 21 Praha 1

Reg. No. (IČO)/VAT No. (DIČ): 00025798/ CZ00025798

Represented by: Mgr. Zdeněk Venera, Ph. D., Director

Implementation representative: RNDr. Vít Hladík, MBA
(the “**Client**”)

and

Legal entity/name and surname: **PEVZNER, ROMAN (sole trader)**

Registered office/residence:  MARROW CL, YANGEBUP, WA, 6164, AUSTRALIA

Reg. No./VAT No.: n/a

Registration in trade register: ABN 78 925 908 896

Represented by: Dr. Roman Pevzner

Bank account details: Beneficiary: Roman Pevzner

Beneficiary Account No: BSB 016307, Account: 197240998



(the “**Contractor**”)

(The Client and Contractor jointly also referred to as the “**Parties**” and separately as a “**Party**”.)

decided to enter into this

Contract for Services

made according to the provisions of Section 1746 (2) of Law No. 89/2012 Sb. (Czech Republic), Civil Code, as amended

(this “**Agreement**”)

1. Initial Provisions

- 1.1 The Client is tasked to coordinate the CO₂-SPICER research project, including the development of a monitoring plan for the pilot CO₂ storage at the Zar-3 site in the Czech Republic. In this context, it is necessary to assess the suitability of seismic methods to track the extension of the CO₂ plume in the storage reservoir. The assessment of seismic methods shall be based on the requested Feasibility Study on the Applicability of Seismic Methods for CO₂ Plume Monitoring (the "Feasibility Study"). The Feasibility Study will use existing seismic data and available geological and petrophysical information, combining them with forward modelling and synthetic seismograms. Various seismic techniques like surface 3D, VSP (incl. 3D-VSP) or cross-hole will be assessed. The main purpose of the Feasibility Study is to assess the possibility of tracking the plume of stored CO₂ at the Zar-3 site using seismic methods.
- 1.2 This Agreement is made following the assessment of tenders submitted in the small-scale public contract for services published by the Client in the procurement procedure "**Feasibility Study on the Applicability of Seismic Methods for CO₂ Plume Monitoring**" (in Czech: "Studie použitelnosti seismických metod pro monitorování oblaku uloženého CO₂") via the NEN Procurement Platform (the "Public Contract").
- 1.3 The Parties acknowledge that the Client's procurement documents (provided in the Client's capacity as the contracting authority) for the Public Contract, as amended and extended, for instance following applicants' requests for additional information, (the "Procurement Documents") and **their Annexes** form a binding part of this Agreement. In addition, the Parties acknowledge that this Agreement has been drafted based on the Contractor's tender in the procurement procedure (the "Tender") and that the Tender forms a binding part of this Agreement. In case of any discrepancies between the Contractor's Tender and materials provided by the Client (in particular the Procurement Documents), the Client's materials will prevail.

2. Subject-Matter of this Agreement

- 2.1 Under this Agreement, the Contractor shall deliver to the Client the following services (jointly the "**Services**"):
 - 2.1.1 **Prepare the Feasibility Study** as set out in the Procurement Documents and the Tender.
 - 2.1.2 Write, in cooperation with the Client, a manuscript of academic paper in a scope and quality allowing its publication in an international peer-reviewed journal.

In delivering the Services under this Agreement, the Contractor shall respect the Client's instructions and requirements. The Services shall be delivered by the Contractor's project team set out in Annexe 2 to this Agreement.

3. Place and Time of Performance

- 3.1 Unless otherwise agreed by the Parties, the Public Contract will be delivered in the Client's registered office.
- 3.2 The Contractor shall deliver to the Client the complete, consolidated and duly executed Feasibility Study according to Article 2.1.1 of this Agreement for comments and consultation no later than 30 September 2023. The Contractor shall deliver to the Client the final version of the Feasibility Study, complete, consolidated, duly executed and amended with respect to the Client's comments and objections, no later than one month after receiving the Client's comments and objections in writing.
- 3.3 The Contractor shall deliver preliminary brief report by 30 September 2023 and the final report written in the style of the manuscript of an academic paper according to Article 2.1.2 of this Agreement no later than by 30 November 2023.

- 3.4 To dispel any uncertainty, the Parties agree and acknowledge that, with respect to the purpose and nature of this Agreement, any partial, incomplete or delayed performance by the Contractor of this Agreement is entirely unfit and does not have any economic significance for the Client.

4. Consideration and Payment Terms

- 4.1 In exchange for the Services hereunder, the Client shall pay the Contractor a fixed, lump-sum consideration (the "Consideration") in the amount of CZK **400,000.00** exclusive of VAT (in words: fourhundredthousand Czech Koruna). The money transfer to the Contractor's account will be made in EUR. The exchange rate of the Czech National Bank valid on the day of the transfer available at <https://www.cnb.cz/en/financial-markets/foreign-exchange-market/central-bank-exchange-rate-fixing/central-bank-exchange-rate-fixing/> will be used for conversion of the payment amount from CZK to EUR.
- 4.2 The Client shall pay the Consideration to the Contractor after the Contractor's duly fulfilling all of its obligations under this Agreement based on an invoice / tax document payable in no less than 21 days of its date of delivery, which the Contractor may issue after the delivery of the manuscript according to Article 2.1.2 of this Agreement and a written confirmation (acceptance) thereof by the Client.
- 4.3 The Consideration and its different parts cover all of the Contractor's costs and expenses as well as those of its subcontractors (if any) incurred in connection with the performance of this Agreement.
- 4.4 The Consideration for the Services rendered will be paid based on the receipt by the Client of the Contractor's invoice for the relevant amount. Invoices are due in 21 days after their delivery to the Client.
- 4.5 The invoice must comply with all requirements of applicable European legislation available on the European Commission's website at https://taxation-customs.ec.europa.eu/vat-invoicing-rules_en. If the invoice does not comply with the above requirements or does not provide the required or requested information, the Client may reject the invoice and ask the Contractor to take corrective action. In such a case, the payment period is suspended and a new one starts from the beginning after the delivery to the Client of the corrected invoice.
- 4.6 The Client shall pay the Consideration in Czech Koruna (CZK) by wire transfer to the Client's bank account specified in the invoice. The Parties agree that the Consideration will be deemed paid in time if the relevant amount is debited from the Client's bank account in favour of the Contractor's bank account by the due date.

5. Cooperation and Communication of the Parties

- 5.1 The Parties shall cooperate with each other and share all information required for the performance of their obligations under this Agreement. The Parties shall inform the other Party of all significant information which is or may be relevant for their due performance of this Agreement.
- 5.2 Immediately after the signing of this Agreement, the Client shall arrange the signing of a Non-Disclosure Agreement (NDA) between the Contractor and the MND a.s. company, the operator of the Zar-3 site, and provide the Contractor upon its request all available data and information set forth in the Technical Specification of the Public Contract.
- 5.3 The Contractor shall keep the Client regularly (at least once a month) informed about the progress of the works and seek his advice regarding all issues or uncertainties related to the drafting of the Feasibility Study.
- 5.4 Unless otherwise provided or agreed by the Parties, all notifications under or in connection with this Agreement must be made in writing and delivered to the other Party preferably by e-mail or, if needed, personally or via registered mail sent to the postal address provided in the preamble of this Agreement.

- 5.5 The Parties shall inform the other Party of any changes to their respective delivery addresses or other significant/statutory changes within three (3) days of the change. Failure to do so results in liability for the damage caused by the non-performance of this obligation.

6. Terms of Contractor's Performance and Warranties for Performance Flaws

- 6.1 The Contractor shall perform the Services under this Agreement with due professional care and make all efforts to ensure the acceptance of the Feasibility Study and its logical framework.
- 6.2 The Contractor is liable for the flawlessness, factual accuracy, correctness, and completeness of the deliverables under this Agreement.
- 6.3 The Client may require that the Contractor rectifies, free of charge, all flaws in the performance of the Services under this Agreement caused by the Contractor, including incompleteness or performance gaps. The Client may raise complaints regarding the Contractor's performance in writing or by email. The Contractor shall rectify the flaws free of charge within a period of time agreed by the Parties. If no specific arrangements are made, the flaws must be removed no later than 10 (ten) calendar days of the receipt by the Contractor of the complaint. The foregoing does not prejudice the Client's right to seek damages or the payment of a contractual fine according to applicable provisions.
- 6.4 The Contractor is considered a person obligated to provide assistance in financial control within the meaning of Section 2 (e) of Law No. 320/2001 Sb., on Financial Control, as amended, and shall cooperate in the exercising of financial control by the provider of the CO2-SPICER grant as well as Czech and European authorities with jurisdiction.

7. Confidentiality

- 7.1 The Contractor shall not disclose and keep confidential all facts and privileged information received or acquired by the Contractor during the performance of the Services under this Agreement.
- 7.2 The Contractor unconditionally agrees that this Agreement will be published in accordance with the provisions of Law No. 340/2015 Sb., Contracts Register Act. The publication of the contents of this Agreement may not be considered a breach of confidentiality.
- 7.3 For the purposes of this Agreement, confidential information includes all facts and information of commercial, production and technical nature relating to the Client or the project at hand having an actual or at least potential tangible or intangible value and are not generally known in the relevant commercial community.
- 7.4 The Client remains the exclusive owner of all confidential information provided to the Contractor and the Contractor may not use such confidential information for any other purpose except the performance of the Agreement.
- 7.5 The Contractor shall keep confidential and not disclose any confidential information to third parties for as long as he has access to or is aware of such confidential information, with the following exceptions. In particular, the Contractor shall:
- 7.5.1 provide confidential information only to persons (its employees or external consultants) who need to be familiar with this information for their involvement in the delivery of the Services hereunder. In this case, the Contractor shall ensure and warrants that any person receiving confidential information according to this Agreement is bound by confidentiality requirements at least equivalent to those imposed on the Contractor by the provisions of this Agreement;

- 7.5.2 not use confidential information to any other purpose except the delivery of the subject-matter of this Agreement according to Article 2 hereof;
- 7.5.3 retain and copy confidential information only to the extent required for the activities related to the delivery of the subject-matter of this Agreement or the documentation of such activities.
- 7.6 The Contractor's obligations under this Article do not apply to information which was in the public domain when provided to the Contractor or become part of the public domain after its provision to the Contractor other than through a breach of this Agreement. Such information is not considered confidential within the meaning of this Agreement.

8. Force and Effect

- 8.1 This Agreement enters into force on the date of its signature by both Parties and into effect after its publication in the Register of Contracts. The Client shall cause this Agreement to be published in the Register of Contracts once duly signed.
- 8.2 The Client may withdraw from this Agreement following a material breach of the Contractor's obligations hereunder. A material breach includes, in particular, the failure to deliver the complete Feasibility Study in the required timeframe.
- 8.3 In addition, the Client may withdraw from this Agreement after finding out that the Contractor:
- offered, provided, received or caused someone to offer, provide or receive anything of value, both directly or indirectly and during the procurement process or the performance of this Agreement, with the aim to influence the actions or decisions of other persons, including, in particular, civil servants; or
 - distorted facts with the aim to influence the procurement process or the performance of this Agreement to the detriment of the Client, including the use of unfair practices with a view to suppress or diminish the benefits of free and open competition.
- 8.4 A withdrawal from this Agreement is effective on the date of its delivery to the other Party. The withdrawal by a Party from this Agreement does not prejudice the obligation of the breaching Party to pay contractual fines or damages in relation to the breaching Party's non-compliance prior to the delivery of the withdrawal notice to the breaching Party. In addition, any provisions intended, with respect to their nature, to remain in effect after the termination of this Agreement shall survive as well.

9. Copyright

- 9.1 If the Contractor and/or his subcontractors develop as part of this Agreement a work subject to copyright protection according to applicable legislation, the Client acquires, as of the day such work is created, an exclusive right to use such work as a whole or any part thereof without any restrictions whatsoever in terms of the manner, location or time of such use (i.e. an exclusive license). The Client will receive this license free of charge. The Contractor shall make maximum efforts to ensure that the Client acquires this right or is able to acquire and exercise it without any restrictions.
- 9.2 In performing this Agreement, the Contractor must not prejudice the copyrights and other intellectual or industrial property rights of third parties and hold the Client harmless from all justified third-party claims regarding copyright or other intellectual or industrial property right violations.

10. Sanctions and Liability for Damage

- 10.1 If the Contactor fails to finish the Feasibility Study in time or does not provide it to the Client for approval in time according to the provisions of this Agreement, the Contractor shall pay a contractual fine of CZK 1,000 (in words: one thousand Czech Koruna) for each day or part of a day during which the default continues.
- 10.2 If the Client fails to pay the Consideration according to this Agreement in time, the Client shall pay the Contractor a late payment interest in the amount of 0.02 per cent of the amount due for each day or part of a day during which the default continues.
- 10.3 The arrangement or payment of a contractual fine according to this Agreement does not preclude the entitled Party from seeking damages to the full extent possible.

11. Final Provisions

- 11.1 The rights and liabilities of the Parties under or in connection with this Agreement are, in addition to the sources set out earlier, subject to Czech law, in particular Law No. 89/2012 Sb, Civil Code, as amended. Any disputes arising from or in connection with this Agreement shall be decided by competent general courts of the Czech Republic. As for first instance territorial jurisdiction, the Client's court is considered competent to decide on the matter.
- 11.2 This Agreement may be amended only in writing in the form of numbered amendments signed by the authorised representatives of both Parties. Any amendments to the first sentence of this Article require written form as well.
- 11.3 The Contractor may assign its receivables from this Agreement to third parties only after first obtaining the Client's written consent.
- 11.4 The Annexes to this Agreement, namely Annexe No. 1, Procurement Documents, and Annexe No. 2, Contractor's Tender, constitute an integral part of this Agreement.
- 11.5 This Agreement has been executed in 3 (three) original counterparts with the Client receiving 2 (two) and the Contractor 1 (one) counterpart.

Client

Contractor

Prague, _____

Perth, 18/08/2023



Ceska geologicka služba

Mgr. Zdeněk Venera, Ph. D., Director



ANNEXE NO. 1

PROCUREMENT DOCUMENTS

Technical specification “Feasibility study on applicability of seismic methods for CO₂ plume monitoring”

Background - justification of the sub-contract

To be able to assess the applicability of seismic survey - the most powerful monitoring tool for mapping the extension of the CO₂ plume in the subsurface, a feasibility study will be performed. The study will use the existing seismic data from the site and the available geological and petrophysical information, and combine them with forward modelling and creation of synthetic seismograms. Various seismic techniques like surface 3D, VSP (incl. 3D-VSP) or cross-hole will be evaluated. The study is subcontracted; the results of the study will be reported in result R7.8.

Main objective

The main objective of the study is to examine the possibility of tracking the CO₂ plume at the Zar-3 storage site by seismic methods.

Description of work to be delivered

The supplier is expected to perform an analysis of available data on the CO₂ storage complex at Zar-3 (see the list below), assess the influence of rock and fluid properties on seismic waves propagation in the complex and consequences of expected changes in these properties due to CO₂ injection. Based on this analysis, the supplier will perform forward modelling and simulations of seismic wavefield and its changes for various seismic techniques with the aim to achieve the main objective of the study stated above.

The study shall include at least the following techniques:

- Classical time-lapse 3D seismic from the surface
- VSP and 3D-VSP (time-lapse)
- Cross-hole seismic (time-lapse)

If a positive result is obtained for some of the assessed techniques, the supplier shall provide recommendations on the technology and methodology of seismic data acquisition (e.g. on signal frequencies, geophones, survey layout, etc.) and processing. Assessment of possible use of the DAS (distributed acoustic sensing) technique in the wells shall be provided.

Expected outcomes:

- Report (feasibility study) summarizing the performed work and its results in detail.
- Peer reviewed scientific article prepared in cooperation with the CO₂-SPICER project team

Zar-3 site data available as input for the study (to be provided to the supplier on the basis of a signed non-disclosure agreement):

- Basic geological information about the storage site, the storage complex, rock and fluid properties

- Sample of legacy 3D seismic data from 1990s-2000s
- Information on the processing parameters of existing seismic data
- 3D geometry of the storage complex based on the static 3D geological model
- Well trajectories for wells considered for possible VSP and cross-hole surveys
- Check-shot survey results from selected wells
- Stratigraphic profiles of selected wells + lithology (mudlogs), selected well logs, especially sonic and density logs
- Results of ultrasonic velocity measurements on rock samples
- Results of initial CO₂ injection simulations (to be available in Q1/2023)

ANNEXE NO. 2

CONTRACTOR'S TENDER

The purpose of the study is to investigate feasibility and plausible configurations for seismic monitoring of geological carbon storage in Zar-3 oil&gas field during the pilot project, e.g. with the overall CO₂ injection limited by 100,000 t. Both surface and borehole seismic options to be considered.

We focus on the following scenario:

- Pure CO₂ is used for the injection - through ZA7 well.
- The injection will have the total volume of 70,000 t and will be carried out over two years.
- The well prior to the injection can be recompleted with fibre optic cable deployed on production tubing (or any other suitable seismic sensors covering the entire well depth).
- Seismic monitoring can include surface 4D seismic acquired concurrently with 4D VSP and comprise of one baseline and two monitor surveys acquired (one) during and (one) after the injection.
- Seismic monitoring can also include offset VSP (maybe even walk-away, but we'll focus on offset VSP geometry) surveys acquired during the injection. We might envisage use of permanent seismic sources for this purpose, but not limited to this option.

Using wireline logs we'll build 1D elastic model for ZA7 (or a nearby well) and, using rock physics modelling, we'll perturb the model to simulate a range of CO₂, methane and oil saturations as per outputs from the flow simulations. We'll require the outputs from the flow simulations computed for the time steps on one month for the two-year period, including saturations, pressures and temperatures.

To perform the simulations we will use an open-source 1.5D MIT OASES code (open source version). It will allow to generate both surface and downhole seismograms for a range of offsets and source/receiver depth. We will analyse common source and common receiver records for the range of plausible offsets and might simulate stacked / migrated outputs, however we will not simulate the full 4D migrated volumes. We might expand modelling and use 2D FDTD codes to explore the edge effects, but, in general, this is outside of the scope.

The following input data is required for the study:

- Log data for the wells (available), including sonic and density.
- Check shot for ZA7 wells (available)
- Flow simulations
- Auxiliary project reports (available)
- Examples of the surface seismic. The raw data example from 1988 survey is irrelevant for the study, 3D volume will be use to validate the similarity of synthetic seismograms. We might require also the examples for the well ties performed for ZA3 well.

A preliminary brief report will be provided at the end of September. Final report – end of November. The final report will be written in a format of a research paper (with extra appendices, which can be excluded if we'll decide to submit the report to a journal. The deliverables will also include digital models (ASCII) and synthetic seismograms (SEG-Y).