



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

Powai, Mumbai 400076.

Ref. PR No. 1000052315

RFx. No. 6100002706

Item Description: Drilling of Scientific Monitoring Wells in Basalt Formations

SCOPE OF WORK

1. Subject of Tender:

Tender for drilling of up to Three vertical wells for scientific monitoring purposes, as defined in the Scope of Work.

Out of the three (3) wells, the Bidder may drill a pilot hole (smaller diameter hole) at any stage, for technical reasons and with prior written consent of IIT Bombay, but shall complete drilling of the final hole size strictly as per the approved Scope of Work.

2. Brief Description of the Project:

IIT Bombay proposes to undertake a field-based scientific drilling and monitoring programme as part of an ongoing research project aimed at subsurface geological characterization and long-term monitoring of basalt formations, particularly in relation to carbon dioxide (CO₂) storage and mineralization studies.

2.1 The wells drilled under this contract shall be used for:

- i. Geological and lithological characterization
- ii. Installation of scientific monitoring systems
- iii. Long-term observation and data acquisition

2.2 Anticipated Subsurface Conditions:

- i. Parameter Description
- ii. Expected lithology Hard and abrasive basaltic formations
- iii. Formation type Volcanic basalt (Deccan Trap equivalent)
- iv. Abrasiveness index Not available; drilling methodology selected accordingly
- v. Anticipated water influx Limited groundwater inflow may be encountered
- vi. Anticipated hydrocarbon influx Nil.

3. Scope of Work (SoW)

3.1 General

The scope of work shall include drilling of three (3) firm wells, at the sole discretion of IIT Bombay, under the same bidding terms and conditions.

Drilling procedures standards:

Drilling, completion, health, safety and environmental protection practices shall conform to recommended oilfield practices as defined in the following documentation:

3.2 IADC drilling manual

Bidder procedures and practices shall be at least in accordance with the IADC manual unless superseded by the bid or instruction from IITB.

3.3 Indicative Well Configuration

Hole Size & Depth

Section Hole Size Depth

Surface Section 12-1/4" 60 m

Main Section 8-1/2" 250 m **

3.4 Casing Programme:

Casing Size Depth : 9-5/8" 60 m

Below 60 m Open Hole (subject to change depending on formation)

Any additional scope not covered under the main SoW shall be executed only on mutually agreed terms and conditions.

4. Deliverables

The successful bidder shall be responsible for:

- i. Drilling of three (3) firm wells within 90 day's from the date of order.
- ii. Supply, installation, and completion of all well components
- iii. Submission of complete drilling, geological, and completion documentation

All work shall be executed under the aegis of Indian Institute of Technology Bombay.

5. Bid Evaluation Criteria (BEC)

5.1 Drilling Technology

All wells shall be drilled and completed using Air Hammer Drilling Technology due to the anticipated hard and abrasive formations.

5.2 Drilling Rig & Equipment

The bidder shall possess or have assured access to a suitable mobile drilling rig of adequate capacity for air hammer operations.

Documentary evidence of ownership or assured availability shall be submitted.

IIT Bombay reserves the right to physically inspect the offered rig and equipment.

Bidder warrants that the structural integrity of the drilling rig is sound and all rig and auxiliary equipment supplied with it are in full conformance to applicable API standard and good industry practices.

The Bidder warrants that Bid entity and rigs are qualified with the Operator for the performance of Work.

5.3 Experience Criteria

The bidder must have successfully executed at least ten (10) wells using Air Hammer Drilling Technology in the last ten (10) years, meeting any of the following combinations:

- 17½" – 200 m and 12¼" – 800 m
- 12¼" – 200 m and 8½" – 1,200 m
- 17½" – 600 m

Documentary Proof (any one):

- i. Completion / performance certificate
- ii. Proof of performance security release
- iii. Final bill settlement proof
- iv. Any other acceptable completion evidence

5.4 Mandatory Submission

Documentary proof of both equipment availability and relevant experience is mandatory.

Non-compliant bids shall be treated as non-responsive.

6. Bidder's Responsibilities

The Bidder shall:

- i. Deploy drilling rig of adequate hook load and capacity
- ii. Provide all air hammer drilling equipment including:
- iii. Primary & booster compressors
- iv. Air hammer and bits

- v. Rotary Control Device / Diverter
- vi. Bloopie line & surface manifold
- vii. Chemical injection pumps
- viii. Handling tools and accessories
- ix. Supply and install all casing, tubulars, and accessories
- x. Ensure full compliance with safety, environmental and statutory regulations.

Provide accessories required for the job including Stabilizers. Stabilizers as per holes size (1/8" or 1/16" UG)

Bidder warrants that the drilling rig and other bid items are properly designed and constructed for the work specified in this Scope of Work, that they are fully capable of carrying out the work and that they fulfil in every respect the requirements and specifications set forth in this Scope of Work. The rig and other equipment required for air hammer drilling technology, not limited to, primary compressors, Rotary Control Device (Diverter), Bloopie line, surface manifold, chemical injection pumps etc will be of appropriate international standards.

7. Drill Site Requirement

Entire drilling operations shall be accommodated within a 30 m × 30 m drill site.

The party shall bear the expenses for electricity and water supply if provided by IIT Bombay.

Bidder shall confirm acceptance of this limitation. Bidder to execute the civil work required for the placement of the rig and equipment within the same scope of work.

8. Safety & Statutory Compliance Requirements

8.1. Purpose

To ensure safe execution of operations and compliance with all applicable statutory, regulatory, and client-specific requirements during project execution.

8.2 Safety Management Practices

- i. HSE policy and safety procedures
- ii. Hazard identification and risk assessment (HIRA/JSA)
- iii. Permit to Work (PTW) system
- iv. Toolbox talks and safety meetings
- v. PPE implementation and monitoring
- vi. Incident reporting and investigation
- vii. Emergency response and mock drills

9. Reports & Documentation

The Bidder shall submit:

- i. Daily drilling progress reports
- ii. Geological & lithological logs
- iii. Casing & completion records
- iv. As-built well drawings
- v. Final completion report for each well

10. HSE & Statutory Compliance

Bidder shall comply with all applicable:

- Environmental regulations
- Occupational health & safety standards
- Local, state, and central statutory requirements
- IIT Bombay campus safety policies

Any incident or non-compliance shall be reported immediately.

Bidder shall submit:

- i. A statement of its corporate strategy for HSE and/or its policy statement on Health and Safety at Work.
- ii. An outline HSE plan for the Services.
- iii. Bidder's HSE Management System.
- iv. Emergency Response Procedures.
- v. The name and title of the person proposed to co-ordinate and be responsible for HSE matters.
- vi. Details of the HSE training given, or which would be given, to the operatives proposed for the Services, and brief details of any proposed tool box talks and any other method by which Bidder will promote safety awareness.
- vii. The latest Bidder or incident and accident statistics stating their basis. The statistics should refer to at least 2 years. Please also submit details of any recent incidents or accidents.

11. Safety Equipment

11.1 Protective clothing

- Bidder shall provide clothing and equipment to each of Bidder's personnel on the site as a minimum the following, but not limited to, safety equipment: Safety helmet approved to a recognised international standard
- Head protection
- Eye protection
- Ear protection
- Impact Gloves

- Overalls
- Safety boots
- Rain Wear
- Personal breathing apparatus – as appropriate for Rig Floor personnel for emergency exists from spot only
- Compressors for filling breathing apparatus
- Fire-fighting equipment and teams

Bidder shall establish fire-fighting teams in accordance with the fire-fighting standards of an internationally recognised training centre which are acceptable in the country of operations. Fire-fighting drills shall be conducted on a regular basis to be agreed with IITB.

12. Pressure safety equipment

Bidder shall equip all pressurised vessels and systems with pressure relief devices installed for the protection of equipment and personnel. All pressure relief devices should be set and calibrated so as not to exceed the recommended operating pressure of the vessel and/or pressure system. Pressure relief valves downstream of mud pumps shall be spring loaded resettable type.

Bidder shall maintain the third-party test certificates for all pressure safety valves and such equipment. Pressure relief valves on air vessels shall be recertified.

13. Liquidated Damages & Time Schedule

The Bidder shall complete the work within 90days from the date of order.

Delay shall attract liquidated damages as per GCC of IIT Bombay.

14. Force Majeure

Force majeure conditions shall be governed by IIT Bombay GCC.

15. General

The contract shall be governed by IIT Bombay's General Conditions of Contract (GCC).

IIT Bombay's decision regarding interpretation of scope and specifications shall be final and binding.

16. ORGANIZATION

The Bidder shall describe the responsibilities of each position of authority, particularly with reference to management, planning, technical, safety, environment and QA/QC.

Details of Bidder's organization and management of the Services including:

- i. A chart (or charts) showing the relationship to corporate management but particularly detailing the management structure of the organisation proposed including all its elements, subbidder and functional groups. The chart(s) shall show titles and names of Drillers and personnel of higher status. The chart(s) shall show lines of communication and lines of authority and shall clearly define the engineering, QA/QC and HSE functions. The organisation shall relate to the mobilisation plan.
- ii. Career CVs of Bidder's proposed Base Manager, Rig Manager, Rig Superintendent, Tool Pushers, Night Tool Pushers, Chief Mechanic/Electrician, Drillers, HSE and other personnel of Senior Status, which shall provide as a minimum, full details of qualifications, years of relevant experience, previous employment and responsibilities. Bidder shall state current location and commitment of proposed personnel.

17. PROVISIONS BY THE BIDDER

- i. Bidder should read the following in conjunction with the Scope of Work
- ii. Bidder shall provide information as requested and indicated by the Scope of Work
- iii. Bidder shall provide copies of all relevant certificates establishing the certification of the Drilling Rig and all principal equipment related thereto for the purpose required. Bidder shall state the availability of the Drilling Rig for inspection by Indenter.

18. QUALITY ASSURANCE

- i. Quality documentation will be stored in BIDDER SYSTEM and electronic copy will be provided to IITB upon request.
- ii. Provide, if available, copies of Quality Plans and programmes produced for similar contracts.
- iii. Define the number, frequency and type of audits of Bidder's own organisation which would be completed during the Contract.

19. SUBBIDDERS

If Bidder wishes to subcontract or associate in any way with another company or other companies for the performance of the Bid, then Bidder is required to state those parts of the Services which it intends to subcontract and name the party which is proposed to carry out that part of the Services. A full description of the scope of work to be sub-bidders, together with details of the proposed sub-bidder's resources, capabilities and its previous experience in relation to the sub-bidder's scope is to be provided.

In the absence of such information, or in respect of the any of the Services not specified as being sub-bidder, IITB will assume that Bidder will carry out the entire or remaining Services itself and no subcontracting or association will be permitted, except with the express approval of IITB.

20. MOBILIZATION AND LOGISTICS

Bidder shall submit a detailed mobilization plan for the Drilling Rig and other Bidder's Equipment showing the proposed project schedule including but not limited to preparation of equipment, freighting of equipment, customs clearance in India if applicable and where

relevant, and land transport. The plan shall also include a reporting format to report progress at scheduled intervals to Indenter.

21. A Rig Inspection and Acceptance by IITB shall be as stated below:

21.1 Rig and ancillary equipment shall be inspected by certified third party prior to issuance of contract authorizing mobilization.

21.2 Upon completion of rig up - a pre spud inspection by certified third party /IITB representative will be conducted immediately for duration of continuous 48 hrs inspection time. Upon acceptance of the rig, crews and ancillary equipment, a contract commencement date will be authorized by IITB.

22. Quantities of equipment

Bidder shall be responsible, at its cost, to provide, store and maintain a readily available stock of Bidder's items, maintenance and repair parts and operating supplies sufficient for continued operations of the drilling rig (for all electronic and mechanical components) and other Bidder items. Bidder shall replenish such stock as necessary in line with good oil field practices.

23. Fishing Equipment

Bidder shall supply a set of certified fishing equipment required for the drilling job.

24. Well specifications and requirements

24.1 Wellhead requirements

The wellhead specifications shall be defined at a later date. The wellhead shall be installed and tested according to the manufacturer's recommendations and as laid down in IITB procedure.

25. Casing requirements

Casing requirement and execution will be specified in the well programme.

- Appropriate casing tongs size of 14" /9 5/8" and 7" or any specific size as per mobilisation and Bidder equipment list will be available for all casings specified in the drilling program. The rig should be able to handle casing sizes from 14" to 7" and 2 7/8" tubing (or any size as per program).

26. Cement requirements

26.1 Handling of cementing chemicals:

Suitable protective clothing shall be worn on all occasions.

In case Chemicals are mixed or handled or used by bidder, related safety precautions taken care as per HSE requirement like eyewash bottles and showers shall be installed in

areas where personnel may be exposed to harmful chemicals i.e., mud mixing area, mud tanks, rig floor.

27. Emergency procedures

Bidder shall conduct, report and record regular exercises for emergency procedures including the following minimum requirement or more often if required by legislation:

- Fire drill - one per week
- Abandon rig drill - once per week
- Emergency Response Drill – at least once per well.

Deficiencies are to be noted and corrective action taken.

28. Traceability

Drill string components shall have a unique identification number for identification and traceability purpose. Driller shall at all times keep an accurate tally of tools and tubulars downhole, noting fishing neck dimensions.

29. Inspection and Calibration

29.1 Standards

All Drillstring components used for operations including, saver subs, drill pipe, substitutes, drillcollars, stabilisers, tools and handling tools have been inspected by a reputable, The equipment shall be rated to work in a 5,000 psi pressure environment and with temperatures up to 250 deg F.

Bidder shall supply IITB with dates when the last inspection and certification was done by the third party on Bidder's drill pipe, collars, subs and other items of the Bottom Hole Assembly were placed in service.

The Inspection criteria shall be based upon DS-1 Standards Category 4 in all aspects and:

Such inspection shall include electromagnetic inspection, including end area, plastic lining inspection and thread visual, profile gauge and magnetic particle inspection.

29.2 Calibration

All instruments, including gauges, meters and recorders, provided by bidder under the bid will be recalibrated in accordance with manufacturers specifications prior to commencement of drilling operations or done by as per Bidder Business Management / operating system. IITB representative will witness the calibration test and details of the test will be recorded. The certificates of all calibration tests shall be available at site always.

30. Lifting and hoisting operations

30.1 Lifting / pipe-handling equipment

Bidder shall only use certified and properly inspected lifting appliances. This includes all appliances in the derrick, such as travelling block, hook, elevators, links and all pipe handling equipment.

All slings and shackles should be identified with safe working load information. Bidder is required to retest all slings, shackles and lifting points or in accordance with API recommended practices (API RP 8B). Drilling line use shall be governed by API RP 9B, Bidder shall have a running ton mile tracking program.

30.2 Safe Working Load Conditions.

Safe Working Load (SWL) rating shall be displayed on all hoists, slings, shackles, beams, supporting appliances, scaffolding and pad eyes for Bidder Rig Equipment.

31. Hazardous area classification

Hazardous areas shall be classified appropriate to API RP 505, DGMS or local regulations.

Bidder shall instruct all his and his sub-bidder's personnel in the significance of the hazardous area classification and shall enforce strict compliance with safe operations therein at all times.

32. General Requirements

Bidder shall ensure that each of bidder's personnel is and will remain competent and efficient and that each of such personnel has and shall have the qualifications, training and expertise necessary for such individual to perform his assigned duties and any necessary technical, professional and administrative qualifications, licenses and certifications to perform his duties in accordance with any applicable laws, regulations and customary practices of the oil and gas industry. Bidder shall furnish the number and types of personnel, which are necessary for it to perform the duties of each position.

Bidder shall respect local customs, culture and traditions. Bidder shall take all possible precautions not to involve any social unrest.

32.1 Bidder provisions

Bidder shall provide all personnel required to drill, complete and suspend wells effectively and efficiently as required by this contract. Key Bidder personnel including Rig Managers, Tool Pushers, Drillers and Assistant drillers qualifications and experience details shall be provided to IITB Authorized Representatives before being assigned to Work. All above Assistant Driller personnel shall speak English. Welders should hold appropriate welder certification acceptable to local authorities. Said personnel shall be allocated to the work, shall be continuously available as and when required from the commencement date onward, and IITB shall approve any proposed change in personnel in advance by submission of CV and interviews for key personnel only.

32.2 Replacement of Bidder's personnel

If any deployed personnel are found to be inadequately qualified or lacking mandatory, valid

certification as per contract requirements, IITB shall have the right to seek their replacement without delay.

33. Number and categories of personnel

33.1 Safety Officer

Bidder must appoint a safety officer for Rig.

34. Training

34.1 Bidder's obligations

Bidder shall maintain training levels for all personnel so as to allow them to properly fulfil their job function.

34.2 Regulations

IITB requires that bidder's and sub-bidder's employees must have completed the safety and skills training within the stated frequency prior to the commencement date unless otherwise stated.

34.3 Safety training

Bidder shall give HSE induction to every person visiting drill site.

Personnel on Board (POB) and Emergency Contact Information

The Rig In-Charge at the site shall submit a daily Person-on-Board (POB) report to the Indenter. The POB report shall be updated immediately upon the departure of the last transport (flight or otherwise) from the site and shall be submitted electronically in Microsoft Word or Excel format.

The Bidder shall provide the Emergency Contact Information Sheet for all personnel on board to the Indenter or person appointed by him prior to commencement of operations. The emergency contact information shall be updated promptly in case of any change in contact details and shall be submitted electronically.

34.4 BHA sheet

Bottom hole assembly sheet is to be submitted after each change in bottom hole assembly containing details of length, dimensions (OD and ID), and component type, fishing neck c/w serial and/or part number.

35. Work Permits

Work permits shall be issued for all tasks requiring hot work, electrical isolation/lockout, vessel entry, working at heights, working in exposed/confined locations, diving or other non-routine

is required. Work plan and permit is to be submitted by bidder supervisor to IITB representatives prior to commencing any such work to ensure that Work is carried out in a permitted safe manner. An isolation policy is to be handed to IITB.

36. Casing tally

The Contractor shall submit casing tallies to IITB representatives at the time of casing receipt on the rig/site. A planned casing tally (string design and joint-wise tally) shall be submitted prior to running the casing in hole. An actual casing tally, reflecting the final string configuration and measured depths, shall be submitted immediately after completion of casing running operations.

37. Documentation

Document formats to be used shall be agreed upon between IITB and Bidder prior to commencement of operation.

38. General layout information for the drilling rig

Drilling rig layout, to scale, showing major items of equipment as rigged up.

39. Layout safety

Drilling rig layout to scale showing out line of major items of equipment together with hazardous areas, safety equipment locations (fire equipment, medical equipment, breathing sets, etc.) muster points and exits. This drawing to be prominently displayed on site.

40. Firefighting plan

Drawing showing all major firefighting components of the drilling rig, lines, hydrant locations, sprinkler locations and hand-held fire-fighting equipment.

41. Location Information

IITB will supply bidder with the appropriate drill site location information including directions.

42. Well programme

IITB shall supply bidder with a draft well programme. Bidder will be encouraged to review and provide comments or suggestions and provide technical support during drilling.

43. Others

IITB and Bidder will mutually agree on any work or personnel related scope, if any is not covered under this Scope of Work or the Contract elsewhere.

44. Payment terms:

30 Days payment term as per milestone based:

Milestone	Scope of Work	(%) of Payment as per PO
Section I	Mobilization subject to satisfactory Certification from Indenter.	25%
Section II	Completion of drilling of first well subject to the satisfactory Certification from the Indenter	25%
Section III	Completion of final work subject to satisfactory Certification from the Indenter	50%

The work shall be completed within 90 days for three wells 250 m each as per SOW. In case of delay, the standard LD clauses of IITB shall be applicable

45. Delay in mobilization and liquidated damages

Successful bidder shall mobilize and deploy the required manpower and the complete equipment's from commencement to completion the services at the specified location within a maximum of 90 days from the date of purchase order.

If the Bidder fails to mobilize and deploy the required manpower / equipment and / or fails to commencement to completion of the services within 90 days, the Client shall have, without prejudice to any other right or remedy in law or contract including sub clause below, the right to terminate the bid.

If the bidder is unable to mobilize / deploy and commencement to completion the services within 90 days , it may request the Client for extension of time with unconditionally agreeing for levy and recovery of standard clauses of LD. Upon receipt of such request, the Client may at its discretion, extend the period of mobilization and shall recover from the contractor, as an ascertained and agreed Liquidated Damages, equivalent to 0.5 % of contract value, for each week of delay or part thereof, subject to a maximum of 10% of the bid value.

The parties agree that the sum specified above is not a penalty but a genuine estimate of the loss/damage which will be suffered by the Client on account of delay on the part of the bidder and the said amount will be payable without proof of actual loss or damage caused by such delay.

LD will be calculated on the basis of contract value excluding duties and taxes where such duties/taxes have been shown separately in the contract.

The applicable GST on the LD shall have to be borne by the bidder. Accordingly, liquidated damages shall be recovered from the bidder along with applicable GST.

46. Defect Liability Period

The Defect Liability Period shall be 12 months from the date of completion of work. Any defects arising due to faulty materials or workmanship noticed during this period shall be rectified by the Bidder at its own cost.