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31 August 2022

**ENQUIRY NO: CTT25046**  
**SUPPLY OF NITROGEN TO PetroSA GTL REFINERY MOSSEL BAY**

**1. INTRODUCTION**

PetroSA owns and operates a Gas to Liquids (GTL) Refinery in Mossel Bay, South Africa.

Most of the GTL refinery is offline. The Air Separation Unit, which normally supplies oxygen and nitrogen to the plant, is shut down due to operating expenses. Nitrogen is still required for the preservation of offline equipment and plant safe making (hydrocarbon freeing of certain equipment).

The purpose of this document is to invite interested parties to tender for the supply of bulk nitrogen and associated rental equipment to the PetroSA facilities in Mossel Bay.

**2. EXISTING FACILITIES**

PetroSA has liquid nitrogen (LIN) storage vessel 03-TK103 of 75 m<sup>3</sup>, or ± 51.5 tons of liquid nitrogen at 7 Barg maximum design pressure. Liquid nitrogen will be imported via road tankers for offloading and storage in the tanks.

Additionally, nitrogen is required to be supplied via road tankers for offloading into alternative cryogenic tank / isotainer installations (to be supplied by bidder) on the Mossel Bay GTL refinery site for direct supply into sections of the plant which require nitrogen purge. These potential alternative locations include Unit 02 (LNG), Unit 27 (HF Alkylation), Unit 51 (Blanding and Storage) and Unit 40 (Flare).

### 3. SCOPE OF SUPPLY

#### 3.1 General

It is required from the Supplier to:

- Comply with the Scope of Work provided in this document.
- Comply with the nitrogen specification provided in this document (item 3.2).
- Deliver ultra-pure nitrogen in bulk supply to the PetroSA facilities in Mossel Bay.
- Comply with the timeframes for delivery as outlined in this document (item 3.3).
- Provide service expertise and reliable equipment for the transport and offloading of nitrogen at PetroSA's premises in Mossel Bay.
- Provide all equipment to connect LIN tanker to the PetroSA LIN tank facilities e.g. flexible hoses, connection flanges, bolts, tools etc.
- The required rental equipment and nitrogen transfer equipment are to be supplied in good working condition.
- Provide Personal Protective Equipment (PPE) for their employees.
- Comply with all requirements to enter the PetroSA high-risk area, including all permits and approvals for entry.
- The bidder will have to physically visit the PetroSA site to confirm the following:

*[1] requirements for connecting to the existing offloading and storage facilities*

*[2] requirements for tanker offloading requirements to the bidder supplied isotainers / tanks, and*

*[3] requirements for cryogenic tank and vapouriser installation.*

These requirements must be provided in the bidder's proposal.

- Offload the product into the PetroSA storage tanks and bidder-supplied isotainers / tanks.
- Ensure that all measures are taken to prevent leakage of nitrogen whilst the tanker is positioned on site.
- Provide a certificate of quality with each delivery to confirm the quality of supplied nitrogen against the required specification.
- Damage by the Supplier to any PetroSA facility or equipment shall be at the expense of the Supplier.
- Provide a Material Safety Data Sheet for their product.
- Provide an Emergency Response Procedure of actions required in case of leakages of nitrogen into the atmosphere during offloading and/or damage to equipment.
- The Supplier is required to provide performance guarantees of its capability to supply and deliver at the quantities, specifications and schedule indicated in Sections 3.2 to 3.3 of the Scope of Work.

- PetroSA will provide the crane and rigging required for initial installation, moves within the site and final removal.
- The only utility provided by PetroSA is electricity 380 V supply. Please provide in bid the connection type required and clarify the maximum distance to the connection point. Please provide the maximum amps.
- Supply pressure vessel inspection certification.
- The bidder must advise in the bid what hazardous area zone the equipment (that will be rented/installed/operated) is suitable for.
- The equipment supplied should be suitable for installation/operation in an operating refinery unit (classified area).
- Provide operating instructions and emergency procedures where applicable.
- Install warning signs on rented equipment and during nitrogen offloading.
- Installation of the rental equipment and nitrogen tanker offloading should be suitable for outdoors on a gravel base (note slab / sealed surface is not available at particular locations).

### **3.2 Nitrogen Purity Specification**

Liquid nitrogen is to be delivered with the following purity specifications:

- Minimum Nitrogen content of 99.998%.
- The maximum Water content of 10 parts per million (ppm).

### **3.3 Delivery Requirements - Nitrogen and Rented Equipment**

- Delivery of one LIN tanker to PetroSA every day. From December 2022 (the exact date is to be confirmed – when PetroSA vapourisation heat pumps are installed and commissioned), delivery of 25 tons per day of liquid nitrogen will be required.
- Prior to the above date, delivery of 25 tons of liquid Nitrogen is estimated to be required only every 2 to 5 days. However, if unplanned hydrocarbon freeing is required sooner, PetroSA would require delivery of one 25-ton tanker every day also in October and November 2022. PetroSA would provide 5 working days' notice for this higher delivery rate if also required in October and November 2022.
- *Demand* will change over the course of the supply contract. e.g., PetroSA expects to install and commission an on-site nitrogen generator from May to July 2023. Once the onsite nitrogen generator is in full operation demand for liquefied nitrogen will be significantly reduced or eliminated.
- When the bidder has informed a LIN tanker delivery of nitrogen is required, the bidder is required to supply to PetroSA within 24 hours.

- Delivery of Nitrogen and Rented Equipment should be between the hours of 8 am to 4 pm.
- When supplying liquefied nitrogen into the rented Cryogenic tanks/isotainers described in the section below (item 3.4.1), the excess from the 25-ton delivery that cannot be accommodated in the tank can be supplied into the 03-TK103 PetroSA Mossel Bay GTL refinery LIN tank if necessary.
- Liquefied Nitrogen Delivery is expected to be required for a period of 9 to 12 months.
- Mobilisation of the rented cryogenic tanks with vapourisers as scoped below (item 3.4), from PetroSA's request to installation at the site ready for commissioning, is required to be a maximum of 5 working days (this is required since may be needed for emergency safe-making). This is necessary due to the potential need to perform required hydrocarbon freeing on an urgent and unplanned basis.
- Rented Vacuum hose and coupling are to be supplied to PetroSA before or on the first nitrogen tanker LIN delivery or the supply of rented cryogenic tank and vapouriser, whichever comes first.

### **3.4 Specification of Rented Equipment for Vaporised Nitrogen Supply**

Normal nitrogen supply to PetroSA will be via delivery to 03-TK103 PetroSA LIN tank for internal distribution, however, supply of Nitrogen is also anticipated into other equipment on the GTL refinery to be able to make these safe (hydrocarbon free).

This supply will also be from liquefied nitrogen trucks/tankers but will require the rental of nitrogen storage and vapourisation equipment for a short term while the safe making is performed. This operation will be performed if necessary either:

- [1] prior to the installation and commissioning of the U03 water bath vapouriser heat pumps or
- [2] at locations where a dedicated supply is required to achieve an appropriate nitrogen purge rate.

#### **3.4.1 Nitrogen tanks for Vapourisation**

Nitrogen supplier to provide request Nitrogen tanks to store and supply LIN to the vapouriser.

1. *Option* for Rental of Cryogenic Tank(s) / Isotainers for Liquefied Nitrogen storage of minimum combined 20-ton total Nitrogen storage capacity. Scope to include:

- To be refilled from LIN tanker (supplied by bidder per nitrogen supply above)
- To be insulated such that nitrogen vapourisation/losses from Isotainer are minimal.
- Note should be suitable to be installed outdoors on a gravel base (or slab if available at the site).

- Include delivery to the site and Removal from the site at end of the rental period.
- Installation including any supports required. Ideally, the frame is mounted in a horizontal orientation to avoid specific supporting and anchoring requirements and facilitate moving around the site if necessary.
- If more than one tank, these need to be coupled together with suitable hoses and isolation valves to allow supply from each tank.
- Needs to be fully coupled up with hoses to Vapouriser (also supplied by bidder see below) and to be ready for commissioning.
- Include removal to an alternative location on Mossel Bay GTL refinery site. Tank to be suitably mounted/supported to enable to be moved to other sites.

2. *Option* for Rental of Cryogenic Isotainer of minimum 10-ton Liquefied Nitrogen storage capacity. Scope to include:

- To be refilled from LIN tanker (supplied by bidder per nitrogen supply)
- To be insulated such that nitrogen vapourisation/losses from Isotainer are minimal.
- Include Delivery to the site and Removal from the site at end of the rental period.
- Ideally should be trailer mounted to facilitate moving about the site.
- Installation including any supports required. To be coupled up to Vapouriser (also supplied by bidder see below) and to be ready for commissioning.
- Removal to an alternative location on Mossel Bay GTL refinery site. Tank to be suitably mounted/supported to enable to be moving to other sites

### **3.4.2 Liquefied Nitrogen Vapouriser**

Rental of minimum 1000 kg/hr Ambient Vapouriser for Liquefied Nitrogen Vapourisation if required from the Nitrogen supplier on request. Bidder must be able to supply 2 ambient vapourisers concurrently if required. Scope to include:

- Necessary instrumentation and controls include:
  - Pressure regulator (set point approximately 300 kPag)
  - The pressure gauge on the outlet or immediately downstream of the pressure regulator
  - Manual valve for flow regulation
  - Manual Isolation valve
  - Outlet low-temperature protection (expected to shut off the flow at low outlet temperature). Indication of when this trip has come on should be able to be easily reset by PetroSA operators.
  - Bidder to provide a description of included controls and instrumentation in bid.
- Hose and all couplings for transfer of liquefied nitrogen from LIN Tank (see above supply) to vapouriser. Acceptable length to be verified during bid clarification site visit.

- The battery limit will be at the flange downstream of the vapouriser and all supplied controls and instrumentation. PetroSA will connect 1” nitrogen hose to this point for distribution to
- The required location on the plant. Bidder to confirm battery limit connection type and size.
- Able to be rapidly de-iced, if necessary e.g., with water
- Include delivery to the site and removal from the site at end of the rental period.
- Installation of Vapouriser complete including any supports required should be frame mounted for easy installation and removal. Vapouriser needs to be installed coupled to liquefied nitrogen isotainer / tank, tested and ready for commissioning.
- PetroSA will operate the vapouriser. Bidder to provide operating instructions and emergency procedures if applicable.
- Removal to an alternative location on the same Mossel Bay GTL refinery site.

### **3.4.3 Coupling and Hose for pulling a vacuum on PetroSA LIN Tank**

Rental of Vacuum Hose and Coupling is required to pull a vacuum on PetroSA LIN tank 03TK103 to avoid the high nitrogen loss rate previously experienced from this tank

- Coupling to be suitable for the connection on PetroSA LIN tank 03-TK103. See the photos below. This can be checked by the bidder, if necessary, during the physical site visit.





- PetroSA will use its own vacuum pump.
- Vacuum hose to have a fitting to connect to ¼" NPT male connection on the pump.
- Vacuum hose length to be confirmed at bid clarification meeting.
- The vacuum hose and coupling are to be vacuum tested before rental to PetroSA to ensure they do not leak.
- The rental would be for 1 week at a time. It is estimated this operation would have to be done 3 times during the contract period. This equipment may be supplied and removed via nitrogen truck supply to avoid separate mobilisation costs.

### **3.5 PetroSA Responsibility**

It is PetroSA's responsibility to:

- Meet and escort the Supplier from the PetroSA entrance gate upon arrival at the site to the offloading facilities.
- To ensure that weighing of the Supplier's truck is done at the PetroSA weighbridge before and after offloading to enable correct invoicing of the product.
- To perform gas tests for the presence of hydrocarbons prior to offloading into the storage tanks.
- Barricading of the area during offloading.
- PetroSA production personnel to confirm the purity of LIN product via COQ delivered by the vendor before transferring into storage LIN tank.

## **4. Enquiries**

Any enquiries regarding this tender should be addressed to **Banzi Dlamini** in the Tender Office at telephone no. 021 929 3202 or e-mail address

[banzi.dlamini@petrosa.co.za](mailto:banzi.dlamini@petrosa.co.za)

## **5. Scope Clarification Meeting / Site Inspection**

PetroSA has scheduled a scope clarification meeting at 10:00 and a site inspection immediately thereafter on 6 September 2022. Should the Supplier wish to attend it must inform the PetroSA representative by 10:00 on 02 September 2022, submitting names and ID numbers of attendees, in order to arrange the necessary permits. ID documents must be produced to gain access to the site.

Suppliers are advised to attend the scope clarification meeting/site inspection in order to acquaint themselves with the nature of the supply required and local conditions, as no claims will be entertained in this regard once the tender has been awarded. **The scope clarification meeting will give Suppliers an opportunity to seek clarification of the tender documentation to facilitate completion thereof.** Non-attendance at the above meeting/inspection will not disqualify a tender.

Yours faithfully

**COMFORT BUNTING**

**Group Supply Chain Manager**