

DESCRIPTION OF THE SERVICES: FOR THE PROVISION OF SPECIALIST CONSULTING SERVICES FOR THE FUEL IMPORT TERMINAL PROJECT FOR THE CONCEPT AND PREFEASIBILITY PHASE FOR TRANSNET PIPELINES

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EMPLOYER'S SCOPE OF SERVICE

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1 INTERPRETATION AND TERMINOLOGY

1.1 Abbreviations and Acronyms

The following abbreviations and acronyms are used in this *Scope of services*:

Abbreviation / Acronym	Description
API	American Petroleum Institute
AR	Allowable Revenue
AVTUR	Aviation Turbine Fuel or JET fuel
BBBEE	Broad Based Black Economic Empowerment
BLNE countries	Botswana, Lesotho, Namibia, Eswatini
Blpa	Billion litres per annum
BoD	Board of Directors
BoK	Body of Knowledge
CAD	Computer Aided Design
CAPEX	Capital Expenditure
CEF	Central Energy Fund
CP	Cathodic Protection
D50	Diesel with 50 ppm sulphur or ULSD
DOA	Delegation of Authority
DOT	Department of Transport
DPE	Department of Public Enterprises
ENREF	Engen Refinery
EIA	Environmental Impact Assessment
EPCm	Engineering Procurement and Construction Management
ETC	Estimated Total Cost
FEL	Front End Loading
HDSA	Historically Disadvantaged South Africans
IOC	International Oil Companies
IRR	Internal Rate of Return
IVT	Island View Terminal
JET	Jet Fuel or Aviation Turbine Fuel
JIEPS	Joint Investment and External Partner Selection Framework
JMP	Jameson Park
JV	Joint venture
LSD	Low Sulphur Diesel



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Abbreviation / Acronym	Description
LTPF	Long Term Planning Framework
MCA	Multi Criteria Assessment
MPP24 pipeline	24 inch Multi Product Pipeline (sometimes referred to as the NMPP)
NATCOS	NATREF Crude Oil Storage
NATREF	National Refinery
NERSA	National Energy Regulator of South Africa
NKP	National Key Point (Now referred to as Critical Infrastructure Protection)
NMPP Project	New Multi Product Pipeline Project
OD	Operating Division
OPEX	Operating Expenditure
ORS	Owners Requirement Specification
PFMA	Public Finance Management Act
PMBok	Project Management Body of Knowledge
PLP	Project Lifecycle Planning
PQP	Project Quality Plan
PPP	Public Private Partnership
PSP	Private Sector Partner
QA	Quality Assurance
QC	Quality Control
P&ID	Piping and Instrument Diagram
ROM	Rough order of Magnitude
S79	Section 79
SA	South Africa
SAPIA	South African Petroleum Industry Association
SAPREF	South African Petroleum Refinery
SCADA	Supervisory Control and Data Acquisition
SFF	Strategic Fuel Fund
SHEQ	Safety, Health, Environmental and Quality
SPC	Systems Process and Controls
SPV	Special Purpose Vehicle
SWOT	Strengths, Weaknesses, Opportunities and Threats
TCC	Transnet Corporate Centre
TFIT	Transnet Fuel Import Terminal
TFR	Transnet Freight Rail
TIMS	Transnet Information Management Systems



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Abbreviation / Acronym	Description
TLR	Tarlton depot
TNPA	Transnet National Ports Authority
TOA	Terminal Operators Agreement
TPL	Transnet Pipelines
TPT	Transnet Port Terminals
ULP95	Unleaded Petrol 95 grade (also referred to as 95 ULP)
ULP93	Unleaded Petrol 93 grade (also referred to as 93 ULP)
ULSD	Ultra Low Sulphur Diesel
VAT	Value Added Tax
WACC	Weighted Average Cost of Capital

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1.2 Project Definitions

Term	Definition
IVT	Island View Site previously referred to as TM1 or Terminal 1
TFIT	Transnet Fuel Import Terminal
NATCOS Site 2	The existing site within the Island View Terminal that is currently occupied by NATCOS and is the location for the TFIT. Also commonly referred to as Lot 108 & Lot 109.
Long Term Planning Framework BoK Report	The report compiled by Mariswe – ETP Joint venture on behalf of Transnet that contains the short, medium and long terms forecasts for the liquid fuels sector, amongst other information.
MPP	Previously known as NMPP (New Multi Product Pipeline).
Cutler Complex	Area within the National Key Point: The Cutler Complex is located at Island View / Fynnland area of the Bluff and is part of the Port of Durban.
PLP	The Project Lifecycle Process, referred to as the PLP, is the methodology for the effective management of capital investment projects within Transnet to ensure that all projects are managed with a consistent approach.
FEL	The term Front End Loading is a term commonly used to illustrate the value and opportunity that may be realized by doing upfront work in the early study phases of the project lifecycle. In this document FEL is also used to distinguish between the distinct project phases as per the Transnet PLP.
Gate Review	This refers to a review conducted by an independent team at the end of each phase to determine whether the work in that phase has been done with sufficient thoroughness for the project to proceed to the next phase.
The <i>Employer</i>	The <i>Employer</i> is TPL, an operating division of Transnet. An individual from TPL will serve as the <i>Employer</i> for contractual purposes.



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Validate	Validate or Validation will require that the <i>Consultant</i> review the existing documentation and drawings and conduct the necessary due diligence to ensure correctness.
Owner's Team	The Transnet appointed personnel to assist the <i>Employer's Agent</i> with the execution of the project.

2 PROJECT CONTEXT

2.1 Project Background

The shortage of refined products in South Africa and the South African Development Community (SADC) in recent times is largely attributable to regulatory challenges such as the Clean Fuels Regulations, which date back to the early 2000s. This lack of investment in refining capacity in South Africa (SA) has persisted for about two decades. Due to the disparity between local demand of liquid fuel products and local refining capability, the volume of refined liquid fuel imports has increased.

The latest edition of Liquid Fuels Demand Study contained in the "LTPF 2021 Liquid Fuels Body of Knowledge (BOK) Final Report Rev 3", hereafter referred to as the LTPF report, indicates that the bulk of the imported liquid fuels are brought in through the Port of Durban's Island View Terminal to supply the Inland market. The consumption for the 2021 calendar year as cited in the LTPF report is shown in Table 01 below.

Table 01: SA and Region's Fuel Consumption 2021

Description	Litres Consumed for the 2021 calendar year	%age of Total Fuel Consumed
Total Liquid Fuel Consumption in SA and the SADC Region	27.4 billion litres	100%
Total Liquid Fuel Locally Refined	16.8 billion litres	61%
Total Liquid Fuel Imported	10.6 billion litres	39%
Total Liquid Fuel Imported through the Port of Durban	9.6 billion litres	35%

The report further indicates that over the short to medium term (10 to 20 years) and the long term (2050), the demand volumes show a marginal increase over this period where the Total Liquid Fuel Consumption in SA and the SADC region is estimated to grow to approximately 30 billion litres over this period up to 2050.

For the 2021 calendar year, the proportion of Total Liquid Fuel Imported through the Port of Durban was an approximate 35% of the Total Fuel Consumption in SA and the SADC region.

The balance between locally refined product and imported product has however shifted significantly now that SAPREF and ENREF have ceased operations. The percentage imported product for the 2022 calendar year has increased considerably to approximately 66% of the Total Fuel Consumption in SA as shown in the table below:

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Table 02: SA and SADC Region's Fuel Consumption 2022

Description	%age of Total Fuel Consumed ¹
Total Liquid Fuel Consumption in SA and the SADC Region	100%
Total Liquid Fuel Locally Refined	34%
Total Liquid Fuel Imported	66%
Total Liquid Fuel Imported through the Port of Durban	59%

Note 1: The percentages contained above are based on market research as the finalised Total Liquid Fuel Consumption in SA and the SADC Region for the 2022 calendar year. The 2023 calendar year consumption is not available for public review.

This Total Liquid Fuel Imported through the Port of Durban and its large proportion is significant to the TFIT business opportunity identified. The focus on this proportion and its potential growth rate per se, is of importance as its evaluation bears directly on business decisions that need to be taken in this regard.

2.2 Business Opportunity Identified

Oil companies own and operate storage and handling facilities throughout the supply chain and in the past, accommodated each other. With the growth in the local market, the oil industry's approach to the industry supply operations is such that each party looks after their own interests thus putting more pressure on the existing infrastructure. The liquid fuels business is essentially about economies of scale and to be competitive within a low margin business, high volumes are required, as described in the LTPF report. Thus, smaller players find it difficult to enter the market as they have two major drivers working against them:

- a) Highly capital-intensive business,
- b) Low economies of scale:
 - i. Pipeline slug sizes,
 - ii. Import cargo sizes,
 - iii. Market size,

Without the economies of scale, the smaller players find it difficult to afford the investment required to manage and run a sustainable business. This is not unique to SA but is rather a global industry phenomenon.

The development of common user facilities would allow these players and others, to independently import refined liquid fuels. Previously there was an intention that the oil industry and other 3rd party storage operators would target this import fuel market as they were building new tanks, debottlenecking infrastructure and looking at revised operating practices to enable them to service the untapped market of Historically Disadvantaged South African (HDSA) owned oil companies as the liquid fuels import share of the national market grows. However, the reality has been that the traditional oil majors have bought up this capacity



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thereby not allowing for new entrants to the industry. In fact, although there is theoretically excess capacity available it has never been made available by the said oil majors, supposedly on the basis that they already meet Liquid Fuels Charter targets through the ownership participation of their BBEE partners.

In a conducive economic environment, Transnet would have taken steps to take advantage of the opportunity, but due to the state of the South African economy in the aftermath of the COVID19 virus as well as the precarious position of Transnet's balance sheet, among other reasons, alternate avenues to take advantage of the opportunities may have to be explored.

2.3 Background to the Ex-NATCOS Site 2 (Lot 108 & Lot 109)

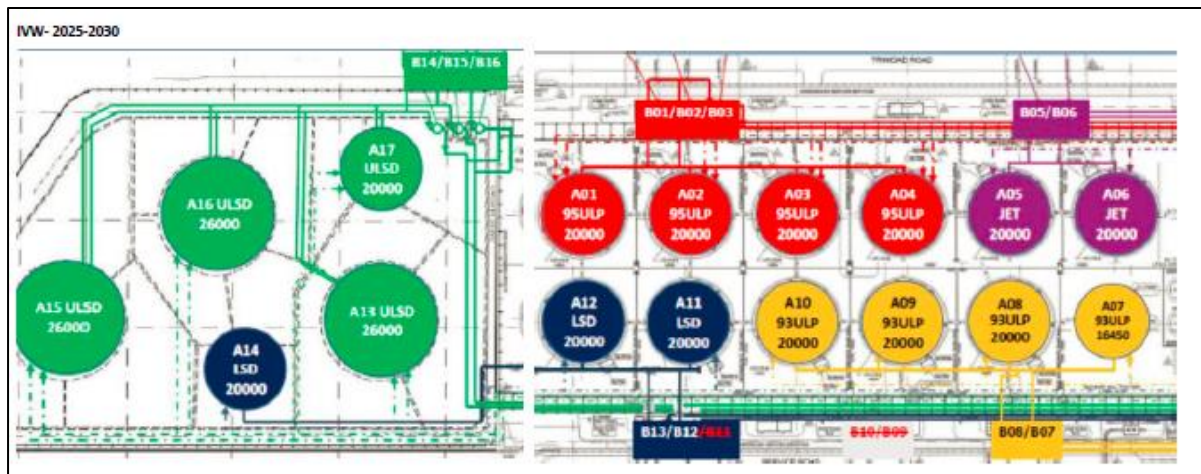
To accommodate the construction of the coastal terminal (IVT) for the NMPP project that entailed (at the time) the requirements for TPL to lease properties commonly known as portion 105, 106, 107, 108, 109 and Bahrein Road, a Section 79 directive was issued on 21 April 2009 allowing TPL a 25-year lease to those properties. The leases, as illustrated in Figure 01 below, were intended to provide assurance for the construction of the NMPP's coastal terminal (IVT) for immediate and future needs.

Figure 01: Illustration of the lease portions



Included in the Section 79 agreement is NATCOS Site 2 that was previously leased by NATREF Crude Oil Storage (NATCOS), and the property contained amongst other equipment is 3 crude oil storage tanks that were used by NATCOS for their crude surge operation as well as crude storage. This property was originally earmarked for the construction of accumulator tanks that form part of the IVT accumulator terminal to accommodate future phases of the NMPP project. See Figure 02 overleaf, which shows a futuristic view of the IVT Tanks product allocation that includes the repurposed NATCOS tanks A13, A15, and A16 in ULSD service.

Figure 02: IVT 2025 – 2030 Tank Product Allocation (at the time~ 2005)



In 2016, the lease of the site was transferred to the management and administration of TPL, and with the future phases of the NMPP being pushed out to beyond 2030, the NATCOS site 2 property has been identified as being ideally suited for the Transnet Fuel Import Terminal (TFIT) instead.

Via project evaluation processes, the 3 tanks, including the usable infrastructure at NATCOS Site 2, were identified for repurposing to serve as a part of the Transnet Fuel Import Terminal. Due to the condition of the tanks as determined through an external assessment, it has been confirmed that TPL would not take over any infrastructure from NATCOS and would just take over the site.

The short-term opportunity that exists is for the site to be operational at the soonest to enable liquid fuel imports. The site's proximity to the liquid fuels shipping berths and the MPP 24 pipeline make it suitable for the development of an Import Terminal.

At present, NATCOS leases the site from TPL on a short-term lease arrangement and TPL leases the site from TNPA at the same cost. NATCOS continues to use the site for crude storage as well as for crude surge operation. Since the NATCOS crude feeder pipeline is the sole crude supply to the TPL crude pipeline to NATREF near Sasolburg, it is thus in TPL's interest to not compromise the NATCOS crude surge operation. NATCOS have verbally undertaken to relocate their operations from the site by 01 August 2026 at the earliest. This needs to be finalised as a part of the scope.

2.4 Contextual Documentation to be used during study.

The completion of the deliverables in the concept and prefeasibility study is reliant on the information summarised in the LTPF report and from the other reports completed by TPL that are contained in Annexure A, and the following principal reference documents can be used to further explain the study context:

- a) *LTPF 2021 Liquid Fuels Body of Knowledge (BOK) Report,*
- b) *Liquid Fuels value chain optimisation*

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- c) *NATCOS - Portions 108 and 109 at Fynnland-(Natcos site 2) presentation*
- d) *Project Initiation Request.*
- e) *Owners Requirement Specification.*

The objective of the study is to extract the pertinent information from the LTPF report, and the other documents listed above and build on the fundamentals established in the reports to advance the project further. The review of the LTPF report is also tasked at highlighting the areas that need to be validated by further evaluation or shortcomings of the LTPF and any other research conducted thus far.

3 STRATEGIC ALIGNMENT

One of the strategic initiatives is for Transnet to co-develop a TFIT facility within the IVT Terminal, where TPL has been identified as the Transnet Operating Division allocated the responsibility of stewardship on the strategic initiative. Further information on strategic alignment will be provided at contract award as required.

4 PROJECT REQUIREMENTS

4.1 *Employer's Project objectives*

The *Employer's* objectives are to lead the development of the TFIT facility, thereby allowing access to smaller participants in the refined liquid fuel value chain as well as supporting the security of supply mandate by creating refined liquid fuel storage capacity at Island View.

The TFIT development also includes the following objectives:

- a) Facilitation of transformation of the sector by facilitating entry of HDSA owned companies into the bulk liquid fuel direct import business.
- b) Potentially supports regional integration with Botswana by creating opportunities for access to direct imports (with supporting infrastructure like MPP24 pipeline and the TPL Tarlton depot).
- c) Potentially increase security of supply because South Africa would no longer be reliant on only a few Oil Majors.
- d) Potentially lower the cost of doing business, (by increasing volume through the MPP24 pipeline thus over the period of time reducing tariffs).
- e) Giving impetus to the mutual mandate shared by the *Employer* and empowerment groups of ensuring security of supply of petroleum products to the country.
- f) Supports creating a competitive industry which is also a NERSA mandate.

By removing the burden of capital spend, away from the black-owned companies and providing a facility that is independent from the control of private companies, the *Employer* will assist the facilitation of entry into the liquid fuels market. It will also allow for open access thereby, allowing new participants to benefit from a common user facility.

4.2 *Employer's Project Requirements*



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In order to complete the project, the key requirements of the project are as follows:

- a) Conduct market research for the TFIT,
- b) Conclude a project development model for the development of the TFIT facility,
- c) Appoint business partners to participate in and fund the development of the TFIT facility,
- d) Conclude an operating model for the operation of the TFIT facility,
- e) Appoint business partners to jointly operate or participate in the operation of the TFIT facility,
- f) Validate existing designs and carry out design and engineering services for the Terminal,
- g) Construct and commission the facility based on the engineering designs,
- h) And finally, to handover to the Operating Entity, the adequately provisioned TFIT to enable the importing and transfer to the MPP24 pipeline of imported refined liquid fuel through the port of Durban's Island View terminal.

The project is to be designed and constructed in accordance with the *Employer's* Engineering standards and specifications in conformance with, but not limited to, the respective ASME, API and SANS codes (Refer to Annexure D for details). The engineering designs is to include but not be limited to the following requirements:

- a) Operational and maintenance requirements,
- b) Process requirements,
- c) Civil requirements,
- d) Structural, mechanical, fire and piping requirements,
- e) Pipeline integrity requirements,
- f) Electrical requirements (including Cathodic Protection [CP]),
- g) Control and instrumentation requirements,
- h) Environmental design requirements.

The project is to be designed and constructed in accordance with the regulatory and compliance requirements as stipulated by the latest legislation, including but not limited to the following:

- a) Regulatory legislation and other requirements,
- b) Environmental legislation and other requirements,
- c) Health and Safety legislation and other requirements,
- d) Construction legislation and other requirements.

The project is to be completed with minimal to no impact on Transnet's day to day operations at the adjacent IVT Accumulator Terminal.

Transnet's policies and procedures are to be adhered to throughout the project lifecycle. Should there be any deviation from the Transnet policies and procedures, the deviation is to be submitted to the *Employer* for approval.

4.3 Project Facility Requirements



With the location of the site being adjacent to the existing IVT Accumulator Terminal site within the port of Durban's Island View Terminal, its proximity to both the IVT liquid fuels shipping berths and the MPP24 pipeline is advantageous.

In addition, the leveraging of the existing NATCOS Site 2 infrastructure that has transferred to the management and administration of TPL could also be advantageous to enhance the business case of the TFIT project. There is however new infrastructure that needs to be invested in, to ensure that TFIT can holistically integrate into the liquid fuels supply chain. The Table 03 below tabulates the project facility requirements differentiating between refurbishment / upgrade of existing infrastructure and the installation of new infrastructure.

**Table 03: Project Facility Requirements**

TFIT Project Facility breakdown and project requirements			
Facility Area	Infrastructure Item	New Infrastructure Requirement	Existing Infrastructure Upgrade / Refurbishment Requirement
Product Receipt Infrastructure	Marine Loading Arm(s)	• Adequately sized marine loading arm(s) to empty a vessel within the required berthing time. • Berthing infrastructure to support loading arm (s). • Electricity and other utilities and services for the loading arm(s).	
	Back of marine berth manifold	• Product manifold situated at back of marine berth to direct product to transfer pipeline(s).	
	Dedicated transfer pipelines	• Adequately provisioned dedicated transfer pipelines per product grade from back of berth manifold to TFIT. • Transfer pipeline routing, servitude requirements and / or racking to support transfer pipelines.	
	TFIT intake manifold	• Adequately provisioned TFIT intake manifold. • Supporting infrastructure for intake manifold.	
	Quality control and contamination mitigation infrastructure	• Infrastructure for quality control and contamination mitigation.	
	Dosing and dying infrastructure	• An adequately provisioned dosing system for the static inhibitor.	



TFIT Project Facility breakdown and project requirements			
Facility Area	Infrastructure Item	New Infrastructure Requirement	Existing Infrastructure Upgrade / Refurbishment Requirement
		• An adequately provisioned dying system for the dying of the product(s)	
Terminal Storage Infrastructure	Product storage tanks including appurtenances	• Construction of the optimal number and sizes of storage tanks for the selected product grades including appurtenances. • Tank bunding as required. • Leak detection systems as required. • Interface infrastructure for tank intake and discharge functions.	
	Dewatering equipment and infrastructure	• An adequately provisioned dewatering system to cater for water ingress into the product tanks.	
Product Feeder Infrastructure	TFIT dispatch manifold	• Adequately provisioned TFIT dispatch manifold. • Supporting infrastructure for dispatch manifold.	
	Feeder pipelines from TFIT to TPL MPP24" pipeline	• Adequately provisioned dedicated feeder pipelines per product grade from dispatch manifold to TFIT. • Feeder pipeline routing, servitude rights and / or racking to support transfer pipelines.	
	Quality Control & Contamination Mitigation Infrastructure	• Infrastructure for quality control and contamination mitigation.	



TFIT Project Facility breakdown and project requirements			
Facility Area	Infrastructure Item	New Infrastructure Requirement	Existing Infrastructure Upgrade / Refurbishment Requirement
Facility Controls Infrastructure	Automation Systems	An adequately provisioned automation system to operate the plant safely and compliantly.	
	Control Equipment	Control panels and field instruments to support the automation system	
Services and Facilities Infrastructure	Pollution Control System	Pollution control system.	
	Stormwater Systems		Refurbishment and or upgrade of the existing stormwater infrastructure and systems. ¹
	Security and Access Control		Refurbishment and or upgrade of the existing security and access control infrastructure and systems. ¹
	Fire Protection Systems and Infrastructure	Fire protection system infrastructure and systems	Fire protection system infrastructure to be integrated into existing IVT.
	Electrical, Lighting and Power distribution	- Power and Electrical distribution for the Terminal. - Small power and lighting for the terminal.	Power supply infrastructure to be integrated into existing IVT.



TFIT Project Facility breakdown and project requirements			
Facility Area	Infrastructure Item	New Infrastructure Requirement	Existing Infrastructure Upgrade / Refurbishment Requirement

Note 1: It is assumed that the existing infrastructure could be refurbished and upgraded economically. If the assumption is proven to be incorrect then alternate options shall be investigated.

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4.4 Employer's (TPL's) Project benefits

The project benefits are listed in the table below:

Table 04: Project benefits table

Criteria	Measure	Updated Targets
Number of additional TPL clients	Increase in number of clients	>/= 1 new client
Increase in volume throughput in the MPP 24 pipeline	Litres/ annum	0.5bn litres per annum ¹
Revenue of independent operating entity	Rands/annum	R135million revenue increase ²

Notes:

1. The increase in volume throughput of the MPP24 will not result in an increase in revenue to TPL but rather a reduction in tariff due to the increased volumes in accordance with the NERSA tariff methodology.
2. The revenue increase is the total estimated revenue allocated to an assumed independent operating entity at an estimated 27cents per litre, where TPL and others will receive a return that shall be linked to their shareholding / development contribution of the independent operating entity.

5 PROJECT EXECUTION STRATEGY

5.1 Transnet PLP Methodology

All capital projects in the Transnet portfolio are managed in accordance with the Transnet Project Lifecycle Process (PLP) methodology. The PLP methodology as described below, is the methodology for the effective management of capital investment projects within Transnet to ensure that all projects are managed in a consistent approach. The study phases, sometimes referred to as the Front-End Loading (FEL) phases, are crucial to the successful implementation of the execution and finalization phases. The term FEL is a term commonly used to illustrate the value and opportunity that may be realized by doing upfront work in the early study phases of the project lifecycle.

This project is to follow the Turnkey type project model where an EPC contractor will be procured for the design and construction phase of the project as shown in Figure 03 below.

A gate review shall be conducted by an independent team at the end of the prefeasibility phase to determine whether the work in the prefeasibility phase has been done sufficiently for the project to proceed to the implementation phase. Hence this project is to be broken up into the 2 sequential phases as follows;

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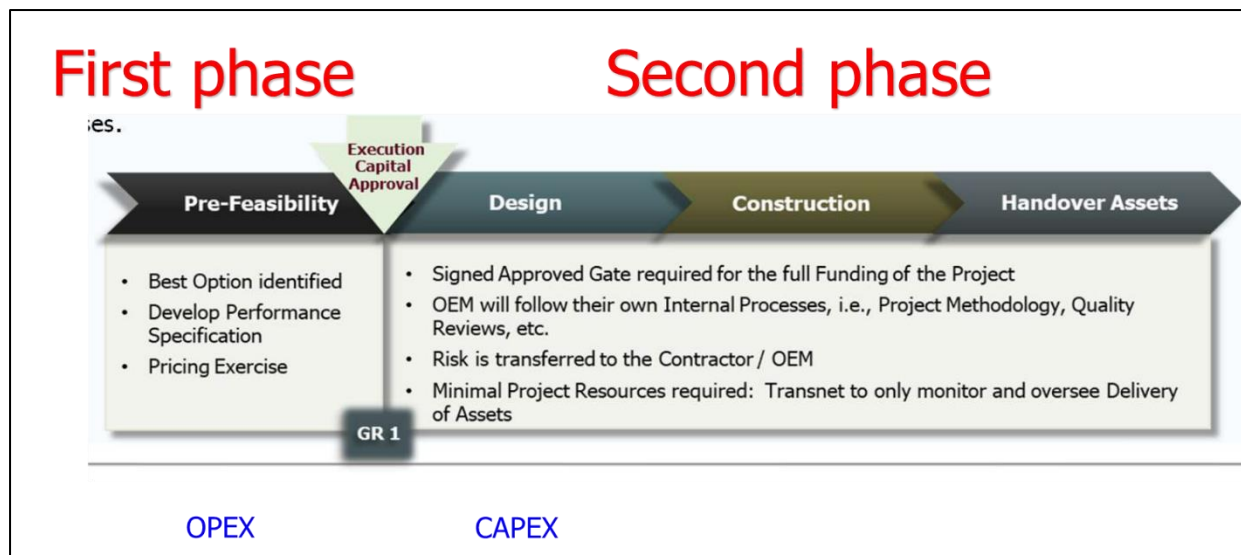
- a) The prefeasibility phase: The optimum option is selected and detailed up to 30% of engineering. The commercial viability of the project is assessed and finalized. A gate review shall be convened at the end of the prefeasibility phase with a "go / no go" outcome.

This *Scope of Services* is restricted to the prefeasibility phase only. financial The documents and reports produced during the study shall be used by the *Employer* during the subsequent phases of the project for further design development, that may be independent of this *Service*.

- a) The implementation phase that includes a combination of the design, construction and close out subphases through an EPC contracting strategy.

The *Consultant* is to note that there are no services to be rendered under this contract during the implementation phase, but this narrative aims to merely capture its requirement for a complete view of the project.

Figure 03: Diagram showing the phases for a Turnkey project model



5.2 The procurement and contracting strategy for the concept & prefeasibility study

All Transnet procurement activities for this phase of the project will be conducted in accordance with the latest Transnet Procurement Procedures. The latest version of the Transnet Goods and Services manual and National Treasury Instructions will be used to govern all procurement and contract administration activities.

The key work packages defined for the concept & prefeasibility study of the project for which service providers will have to be procured is summarised as follows:

Table 05: Procurement Package Plan Summary

No.	Description	Tendering Strategy	Contract type
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TFIT 001	Specialist Consulting for Scoping, Screening, Optioneering and Option Selection	This scope of service or contract.	
TFIT 002	Land Surveying Service Provider	Included in this scope	
TFIT 003	Geotechnical Surveying Service Provider	Included in this scope	
TFIT 004	Request for Interest / Expression of Interest	Open tender procurement process	N/A

6 SCOPE OF SERVICES TO BE PROVIDED BY CONSULTANT

6.1 Service Scope

The Consultant is to provide a combination of commercial and engineering consulting services to the *Employer*, thereby assisting the project owner's team in the development of the TFIT project.

- a) The commercial aspect of the services is to include analysis of the pertinent aspects of the refined liquid fuels value chain including upstream, midstream and downstream assessments and the evaluation of the TFIT's presence and impact on the sectors of the value chain. This is to include the required commercial, financial, regulatory and compliance assessment for the development of the project.
- b) The engineering aspect of the services is to include specialist petrochemical and marine engineering services in the marine loading, pipelines, and petroleum storage tanks domains for the conceptual design of adequately provisioned infrastructure and equipment for the TFIT.

These services are to be undertaken for the concept & prefeasibility study within the PLP process and will include the requirement for the *Consultant* to participate in the prefeasibility phase gate review at the end of the prefeasibility phase.

At the end of the prefeasibility phase the project may be given the authority to proceed or not proceed onto the next PLP phase, being the feasibility phase.

The *Employer* intends to enter a contract with a service provider to assist the *Employer* in the development of the project during the concept & prefeasibility study phase. The *Consultant* will serve as the Specialist Consultant reporting to the *Employer's Agent* and the services in brief is to include but not be limited to the following,

- a) Review and align to the commercial, regulatory, engineering and financial requirements for the development of the project,
- b) Conduct concept engineering designs for the various operating options listed,

- c) Conduct a comprehensive market analysis of the sector or part of the liquid fuels value chain that the proposed TFIT shall operate in, including the impact that the TFIT shall have on that sector,
- d) Develop conceptual operating models for the TFIT as input to the market enquiry documentation to provide rough order of magnitude information to the market,
- e) Develop feasible project development models and prepare market enquiry documentation to source likely development partners,
- f) Conduct a comprehensive optioneering study or multi-criteria assessment to weight, score, rank and select the most optimal operating option.
- g) Develop, collate and submit gate review documentation based on the concept and prefeasibility study and participate in the end of the prefeasibility phase gate review,
- h) Conduct the concept & prefeasibility study close-out, including technical, administrative and contractual closure of the concept & prefeasibility study.

6.2 **Service Scope Generalities**

The *Consultant* shall be a member of the *Employer's* project team and in addition to his areas of responsibility where required by law, shall adhere, but not be limited to, the following *service* requirements:

- a) Report to the *Employer's Agent* in respect of the Contract and the *Service* requirements,
- b) Review, familiarise and understand the proposed site(s) for the TFIT including all constraints, limitations, opportunities and unique environmental factors,
- c) Consult, advise, direct and interface with all members of the project team with regards to multi-disciplinary engineering and commercial expertise in the development and submission of the study deliverables,
- d) Review, familiarise and understand the operational requirements of the shipping berths,
- e) Review, familiarise and understand the operational requirements of the TFIT facility, the associated transfer and feeder pipelines and the integration of the TFIT into the MPP24 pipeline,
- f) Develop the concept designs for the pertinent engineering elements on the project,
- g) Prepare preliminary designs, presentations, schematics and images of new and / or updated proposed designs where needed of this project,
- h) Prepare the necessary calculations, and / or computer simulations on engineering elements where needed,
- i) Undertake and be available to execute design reviews at various stages of the study,
- j) Get familiar with the existing and potential stakeholders (e.g. NATCOS, SFF, Cutler, Transnet National Port Authority, eThekweni Municipality etc.) and engage with them if required by the *Employer's Agent*,
- k) Prepare reports to the project team at the various stages of the study,
- l) Chair and/or assist with project meetings and prepare and submit project meeting agenda's, minutes, etc. timeously,
- m) Chair and/or assist with commercial meetings, design coordination meetings and relevant stakeholder meetings,



- n) The Consultant shall adhere to the *Employer's* management procedures/plans or amend the procedures/plans with the approval of the *Employer*,
- o) Prepare documentation and drawings as per the *Employer's* drawing and documentation standards,
- p) Any other reasonable services required to successfully conduct the study on time, on budget and at the accepted quality.

6.3 *Employer's* design

There is currently limited design documentation available pertinent to the project. There are however as-built drawings and documentation for the existing infrastructure situated at lot 108 & lot 109 as well as the as-built documentation for the IVT Accumulator Terminal intake manifold that the TFIT will interface to that are contained in Annexure D. In these instances, The *Employer* grants the *Consultant* access to the design information presented to the *Consultant* for the purpose of the services.

It is the *Employer's* requirement that where there are existing designs, these designs be reviewed, and accepted by the *Consultant*. Should there be any changes that needs to be made to the existing designs the *Employer's Agent* needs to approve these changes.

6.4 Consultants Design and Objective

All designs produced by the *Consultant* is to carry the respective liabilities and indemnities required. The designs and other relevant documentation produced by the *Consultant* at the end of the study shall be handed to the *Employer* in native and signed off PDF versions for further development by others during the subsequent PLP project phases.

6.4.1 Consultant's Design Objective

The *Consultant's* design objective is to develop and agree with the *Employer*, a methodology that will take the project from the current pre-conceptual stage to a stage where the optimal option is selected for further development during the feasibility phase of the project.

It is also an imperative that the project objectives are aligned to the overall Transnet business objectives hence the project approach of the *Consultant* needs to consider the *Employer's* business objectives. The following are the overarching business objectives that will guide decision making on the project:

- a) Provide the deliverables such that it will enable the reduction in the cost for the provision of the value-add services that the TFIT will offer,
- b) Provide for reliable, safe and cost-effective design services that meet world class standards,
- c) Optimize capital investment to meet the long-term national demand,
- d) Maintain flexibility to respond to changing technological and economic conditions,
- e) Respond to environmental opportunities and constraints in a sustainable manner,
- f) Align with local, regional and national planning initiatives,
- g) Integrate and align capacity with Transnet's sector development strategies.

The above will assist the *Employer* to make critical and strategic infrastructure investment decisions and if proved feasible, secure funding and or partners in order to proceed with the subsequent feasibility, bankable feasibility, execution and close out phases of the project. The *Consultant* is required to comply with the requisite level of effort as per the Transnet PLP process for the commercial study and engineering design across all disciplines.

7 DETAILED SCOPE OF SERVICES

The *Consultant* is to submit a proposal for the execution of the scope of *Services* within a short a period as practically possible. The proposal is to include the following:

- a) A brief write-up of the method statement for the *Services* required during the study,
- b) A high-level program or schedule (Level 4) aligned to the method statement, showing the critical path,
- c) Staffing and resourcing for the *services* to be rendered for each activity,
- d) A detailed cost breakdown for the *Services* to be rendered and a monthly cost flow forecast aligned to the program until completion of the study.

7.1 The Study Management Plan

- a. The *Consultant* is to submit a study management plan for the execution of the *Scope of Services* within 2 weeks of appointment. The activities under the *Services* is to be optimized such that the period of the *Services* under the contract is to be executed as soon as practically possible. The study management plan is to include the following:
 - i. A brief write-up of the method statement for the *Services* required during the study,
 - ii. A high-level program or schedule (Level 4) aligned to the method statement, showing the critical path,
 - iii. Staffing and resourcing for the *services* to be rendered for each activity,
 - iv. A detailed cost breakdown for the *Services* to be rendered and a monthly cost flow forecast aligned to the program until completion of the study.
- b. Included within the study plan, shall be the monthly activities for costs associated with the project management, of the study to account for the planning, control, monitoring and management of the activities within the study including all relevant PM BoK knowledge areas applicable to the *Services*. This is to include all the activities from the first activity, being the study kick-off meeting until the final activity or study close out during the prefeasibility phase with the primary activities as envisaged by the Employer as follows:

Table 06: A summary of the primary activities of the study

The study management plan.	Study Management Plan,
Concept Study Phase	Project kick-off,
	Concept options identification,
	Concept options pre-screening,



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	Concept options definition	Technical & Operation workstream,
		Legal, Regulatory and Compliance workstream,
		Commercial workstream,
		Financial workstream,
	Concept options finalisation and approval,	
	Completion of Project Charter.	
Prefeasibility Phase:	Prefeasibility Phase Kick-off	
	Multi Criteria Assessment (MCA) of shortlisted options,	
	Selected option finalisation and approval,	
	Gate Review documentation (Including Engineering) preparation,	
	External Partner Selection	
	Prefeasibility phase gate review,	
	Business case compilation	
	Study close out.	

- c. A kick-off meeting is the first activity and is intended to align the Employer's project management team with the Consultant project management team on the study requirements to complete the activities efficiently. The study management plan is to be included in the kick-off meeting as an agenda item and is to include the following key points of discussion:
- i. A detailed sub-activity list with descriptions of the sub-activities until study completion.
 - ii. The program with key milestone dates.
 - iii. Requirements of the project owners' teams and other stakeholders on reviews, signoffs, and approvals.
 - iv. Clarifications and questions.
 - v. The planning and agenda of the fortnightly meeting and reporting requirements.
 - vi. Key study risks, issues, etc..
- d. The *Consultant* is to obtain approval from the *Employer* on the study management plan.

7.1.1 Control and Monitoring of Study

It is recommended that the following project management activities are allowed for in the resource allocation and costing of the control and monitoring aspect of the study to include, but not limited for the following:

- a) A fortnightly (2 hour) meeting with the *Employer's* project management team to include for the following:



- i. Schedule updating, time management and cost flow forecasting of the activities within the study,
 - ii. Project management teams reporting, alignment and progress updating amongst other items.
 - iii. A simple yet effective progress report is to be submitted to the *Employer's* project manager on the progress of the study that shall form the basis of the meeting discussions and is to be minuted by the *Consultant* project manager.
 - iv. Contractual fortnightly (1 hour) meetings with the *Employer's* project owner's team to review the status of the contract for the duration of the study.
- b) A monthly (3 hour) meeting with the *Employer's* project management team to include for the following:
- i. A comprehensive monthly project progress report to summarize progress achieved during the month based on the project schedule, contain the month look ahead, highlight concerns, emerging risks, and other items that will enable efficient project management of the study.
- c) Technical, commercial, financial, legal review meetings, risk reduction meetings, etc. with the *Employer's* owners team as required.

The monthly reports are to be compiled and submitted by the *Consultant* for the *Employer's* approval at the end of every applicable month and the *Employer* approved monthly report will be regarded as the completion of the activities under this section.

7.2 The Concept or Screening Phase,

The primary aim during the concept phase is to develop numerous conceptual options based on the variables to the TFIT listed below to ensure the concepts cover all the possibilities for the development of TFIT.

During the concept phase the project conceptual options are to be defined to a reasonable amount of definition and is to follow a methodical process to make sure all possible factors are considered and covered for an accurate assessment of the concept options.

For ease of effort and clarity of activity deliverables, the *Employer* has proposed the breaking-up of the study requirements into suggested work streams covering the minimum areas defined per work stream that are further detailed in the sub-sections below.

It is also suggested that, in order to minimize the effort on developing non-viable options, a pre-screening of the conceptual options is conducted during the concept phase to shortlist the most viable options during pre-screening, such that only the viable options are sufficiently detailed and progress to the concept option definition activity and prefeasibility phase for assessment, scoring, ranking and eventually the selection of the preferred option.

7.2.1 Project Study Templates Compilation

As a control to ensure that the study deliverables are produced to the *Employer's* expectation in an efficient manner, the *Employer* requires that the project specific templates for the various document types are produced by the *Consultant* at the outset of the study.

The following document types are to be included during this activity:

- a) Reports – Reports are to be compiled to include for the following requirements:
 - i. Font – Tahoma,
 - ii. Font size – 11,
 - iii. The cover page that includes the project title, the contract title, contract number, the *Consultant* organisation name, *The Employer* organisation name, the compiler, compiler title, reviewer, reviewer title, approver, approver title, project sponsor (Russell Bradbrooke), document revision and document date.
 - iv. An abbreviations and term definition section,
 - v. A table of contents, including table of tables and table of figures,
 - vi. The body of the report is to be arranged using appropriate heading styles,
 - vii. All annexures referenced in the report at the end of the document.
- b) Drawings – As per the TPL drawing standards contained in Annexure D.
- c) Presentations – As per the TPL presentation templates to be issued at the kick-off meeting.
- d) Gantt chart - As per programming requirements in Section 13.4 below.

The *Consultant* is to submit the templates to the *Employer* for approval.

7.2.2 Concept Options Identification

During this activity, all the viable options and sub options, hereafter referred to as options are to be identified and listed, with a high-level description identifying and distinguishing the options from one another. This activity is to be robust such that all the options are covered by the *Consultant*. The variables upon which the option concepts are to be identified includes, but is not limited to the following:

- a) What products / product grades are to be handled at TFIT?
- b) Which IVT shipping berth are to link up to the TFIT, i.e. berth 05, and / or berth 06 and / or berth 07 and / or berth 08 and or berth 09 (hereafter referred to as berths 05 through 09).
- c) Transfer pipeline routing options.
- d) Feeder pipeline routing options.
- e) Tank sizes to be constructed and product allocation.

The LTPF Report lists 5 of the most feasible options or themes with various permutations based on the above decisions that needs to be taken and can be referenced in the LTPF report contained in Annexure A for further details. The report evaluates the various themes based on key issues or constraints, capex estimates, a SWOT analysis, a decision criterion and scoring matrix. The Themes evaluated were as follows:

Theme 1 – Diesel D50 Imports at Berth 5

Theme 2 – Diesel D50 and ULP95 Imports at Berth 5

Theme 3 – D50 and ULP Imports at Berth 9

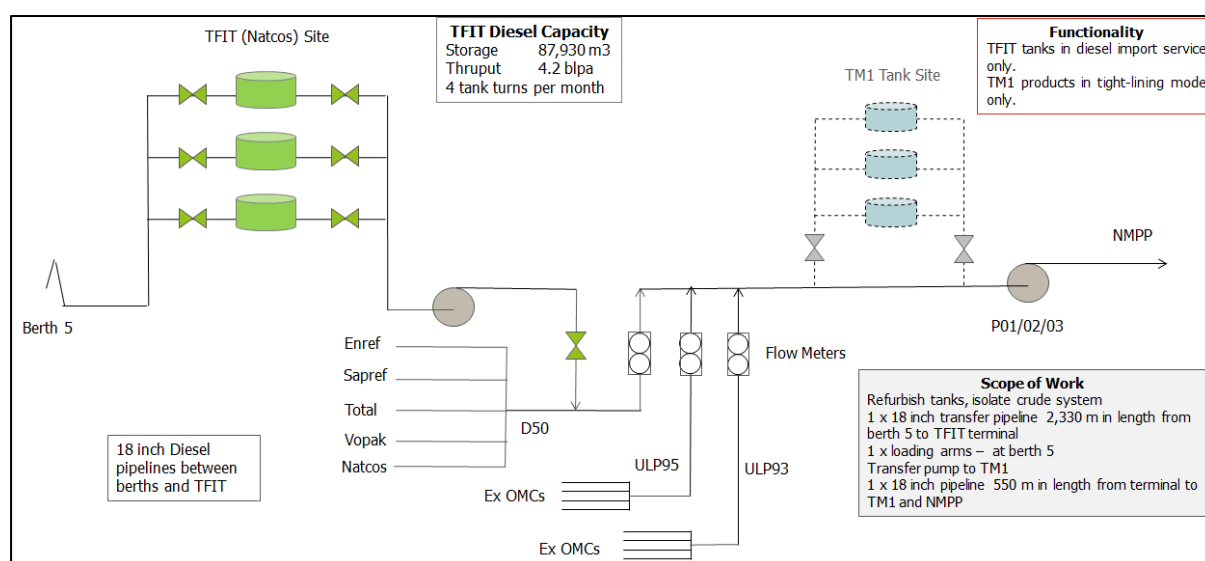
Theme 4 – Tanks in Import and Accumulator Service at Berth 5

Theme 5 – Maximum Flexibility D50 and ULP in Import and Accumulator Service at Berth 5 and Berth 9

Theme 1 came out as the most attractive option for the TFIT and is further described in Figure 04 below, due to its simplest operations i.e. importing diesel only via berth 5 and using the opportunity to link into the switching manifold at berth 6 to provide the operational flexibility to connect to the other fuel berths and oil company storage tanks linked to these berths.

It is noteworthy that at the time of the LTPF report, the 3 storage tanks were assumed to be “refurbishable” but this assumption has proved to be untrue and for the purpose of the study new tanks, tank layouts and tank allocations are to be proposed.

Figure 04: TFIT Theme 1 – D50 Imports at Berth 5



Furthermore, theme 1 is cited as having the following advantages:

- It's the lowest capital cost, since only one product transfer line is required.
- Two tanks are capable of receiving a full load of MR sized ship cargos of diesel. Thus, capex on the third tank can be deferred if preferred by the developers.
- Diesel sees the highest demand growth in South Africa and is the product that requires the most imports. By comparison, petrol demand growth is low to flat.

There are additional advantages offered by Theme 1 using a phased approach. Besides being the simplest and least complex option in terms of development and NERSA (legal) requirements, it still provides opportunities to expand its services to the market:

- Adding petrol or AVTUR storage services if the market demand looks attractive.
- Responding appropriately to any future changes in the market environment such as the new Richards Bay refinery.
- A **phased approach** also mitigates the risk of making regret investment decisions now. It allows a future, better informed decision making, based on facts rather than uncertain data.



The outcome of the options identification activity is to include the viable options to be workshopped with the *Employer's* project team and changes incorporated accordingly. Once approved the consultant is to compile a report documenting the outcome of this activity and submit to the *Employer* for approval.

7.2.3 Concept Options Pre-screening

The study is to include an options pre-screening activity. During the Concept Options Pre-screening it is prudent to initially pre-screen the identified concept options based on the critical criteria that would shortlist the most viable options. The rationale is that the effort, cost and time to evaluate unviable options could be avoided. The critical criteria for the pre-screening activity that is proposed by the *Employer* as the pre-screening criteria is as follows:

- a) Cost Impact,
- b) Schedule Impact,
- c) Any fatal flaws identified in any of the options.

The options pre-screening activity is to be workshopped with the *Employer's* project team to jointly agree the Concept options that would be eliminated. The final report is to be submitted by the *Consultant* to the *Employer* for approval.

7.2.4 Concept Options Definition

During this activity, the concepts are to be defined and fleshed out such that a conceptual framework of the concept options is developed to a reasonable amount of definition. The *Employer* has recommended that the options be developed using a methodical process and as such has divided this section into work streams. Figure 05 below includes the principal work streams and list their broad areas of focus / deliverables.



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Figure 05: Study Work Streams.

Legal, Regulatory and Compliance	Operations and Technical	Commercial	Financial
•Port Loading Permit and License Requirments •NERSA Construction and Operations License Requirements •Environmental Permitting Requirements •Construction Regulation Requirements •Other legislation •Transnet approval requirements	•Operations Philosophy •Existing Infrastructure Assessment •New Infrastructure Requirements •Operations Requirements (HR) •Rough Order of Magnitude Cost Estimate	•Market Demand Analysis •TFIT Throughput Capacity •Transaction Objective •Island View Berth Capacity •TNPA Port Strategy •The SPV •Socio-Economic assessment	•Financial History •Tariff Model and Structure Research •Throughput versus Rental Storage •Financial Model •Evaluation of Infrastructure situated at NATCOS site 2 •Project Funding Strategy

7.2.4.1 Legal, Regulatory and Compliance Work stream

This work steam is to establish the legislative landscape that the project shall be impacted by, over the project lifecycle of the Terminal, from the conceptual phase though to the handover of the Terminal for operations. The sub-sections below highlight the significant legislation, as viewed by the *Employer*, but may not be exhaustive, hence the *Consultant* is to review the section below and expound it accordingly.

7.2.4.1.1 Port Loading Permit and License Requirements.

The installation of loading arms and associated berth infrastructure on the berths 05 to 09 is a key component of the TFIT project. The Terminal Operating Agreement (TOA) that is to be issued by TNPA to TPL is currently at an advanced stage of award and is anticipated to be concluded by the awarding of this contract. The TOA is not included in this scope of service document pack but shall be submitted to the *Consultant* at the onset of the study.

Once the TOA is received, the berth development itself and compliance with regulatory requirements will be governed by the NERSA licensing processes.

The *Consultant* is to review the TOA and the applicable legislation governing the TOA and validate the existing ruling / interpretation. This may include engagement with the respective government departments and NERSA.

7.2.4.1.2 NERSA Construction and Operating License.

It is assumed that a Special Purpose Vehicle (SPV) will be established to fund the execution of the project in accordance with the designs who will duly apply to NERSA for a construction



license and receive a tariff, that provides a reasonable return on investment to the project developers.

On commissioning of the TFIT, The Operating Entity will operate the facility as an independent terminal operator, who will apply to NERSA for an operating license and likewise receive a (storage and handling) tariff, which will then generate the revenue that provides a reasonable return on the operation of the TFIT to its shareholders.

The *Consultant* is to review the applicable legislation governing the construction and operating licenses and validate the licensing requirements. This may include engagement with NERSA.

7.2.4.1.3 Environmental Permitting Requirements

Petroleum fuel projects normally trigger a requirement for an environmental impact assessment (EIA) study. These processes can be lengthy, taking up to 12 to 18 months to complete depending on the study requirements.

An environmental assessment needs to be conducted during the study, including the review of the environmental permitting requirements and recommendations on the permitting requirements for TFIT. The permit application processes are to be initiated as soon as possible, as the timeline for any EIA studies is likely to fall on the critical path to project commissioning.

The *Employer's* environmental specialists has performed an Environmental screening exercise and can be obtained for alignment at the project kickoff.

7.2.4.1.4 Construction Regulation Requirements

The Construction Regulation of the OHS Act requirements will need to be followed from project kick-off through the design development phases until project handover. The project will be a labour-intensive project during the construction phase and the requirements need to be aligned to the regulations as well as the Transnet Integrated Management System (TIMS).

7.2.4.1.5 Other Legislation

The project will also be impacted by other applicable legislation. This includes but is not limited to the following:

- a) *Construction Industry Development Board Act, 2000 (Act No. 38 of 2000);*
- b) *Deeds Registries Act, 1937 (Act No. 47 of 1937)*
- c) *Petroleum Pipelines Act No. 60 of 2003;*
- d) *Major Hazard Installation Regulations;*
- e) *National Energy Regulator Act No. 40 of 2004;*
- f) *National Environment Management: Air Quality Act No. 39 of 2004;*
- g) *National Environmental Management Act No. 107 of 1998;*
- h) *National Water Act No. 36 of 1998;*
- i) *National Key Points Act No. 102 of 1980;*



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- j) *National Ports Act No. 12 of 2005;*
- k) *Occupational Health and Safety Act No. 85 of 1993;*

7.2.4.1.6 Transnet approval Requirements

The TFIT project may be co-developed and if so, shall follow the Joint Investment and External Partner Selection Framework. The project approval requirements includes for the business case to be routed through a Steering Committee and may require approvals from TPL, the Transnet Corporate Centre and final approval by the Transnet Board of Directors (BoD). These requirements need to be considered and factored in the terminal development process.

7.2.4.2 Operations and Technical Work stream

7.2.4.2.1 TFIT Operating Philosophy

7.2.4.2.1.1 TFIT Operating Context

The TFIT project revolves around the repurposing of NATCOS site 2 into a common user, Transnet Fuels Import Terminal (TFIT).

The existing three crude tanks, each with 32,568 m³ nominal capacity/ $\pm$ 29 000m³ working capacity, will be demolished by NATCOS and the site will be handed to TPL in a state "that was the original state of the site when the site was handed to NATCOS by TNPA before the site was developed by NATCOS".

The research is to include the evaluation of liquid fuels import capacity that could be created by erecting new storage tanks, installing pipelines and berth infrastructure to connect TFIT to the berths 05 through to 09.

The TFIT will also need to be connected to the MPP24 pipeline via the IVT Terminal, thereby creating a product supply chain to the Gauteng market and beyond for TFIT clients and their customers.

The layout of TFIT within the Island View complex showing the possible berthing options and transfer pipeline routing options is shown in Figure 06 below.

Figure 06: TFIT within the Island View complex and connections to berths and IVT or TM1



The shortlisting of berth 05 and berth 09 having capacity to accommodate imported product needs to be validated as a part of the study and will require engagement with TNPA for confirmation of the shortlisted berths.

7.2.4.2.1.2 TFIT Operations Procedure

A simplified understanding, of the unloading and injection operations are as follows:

- a) Conduct a product test on the shipping vessel before the product is declared ready to be offloaded or pumped out of the ship.
- b) This process includes for the inspection to be conducted by an independent product surveyor.
- c) The volume transfers are carried out by conducting a pre & post dip on the tanks (manual).
- d) Quality control such as sampling are taken to the nearest laboratory.

These operating procedures need to be expounded on during the study and any other items of significance to the operation of TFIT needs to be investigated and documented for consideration. The following questions are suggestions of what needs to be clarified in discussion with berth operators to further understand the operations process, such as:

- a) How does TFIT deal with off-spec product?
- b) What are the dependencies for ship berthing?
- c) What are the demurrage costs and how does it affect the operations?
- d) Other specifics with regards to the shipping vessel offloading operation.

Other items of significance with regards to operations are as follows:

- a) The product needs to be dyed and dosed with a static inhibitor.



- b) The first 100, 000 litres of product that is unloaded of the ship contains some water and needs to be diverted to an intermix tank that needs to be separated. **(There are currently no intermix facilities situated at the NATCOS site 2 and needs to be included in the design).**
- c) The last off loader out of the shipping vessel gets the dust, and other stuff that generally float to the top of the vessel storage compartment.

7.2.4.2.1.3 Operating Requirements

The import operating mode is described as linking the TFIT to berths 05 through 09 via transfer pipelines, and fuels can be discharged from ships into the TFIT. The advantage of berth 09 is that loading arms exist on the berth, thus avoiding the need for new equipment. Permission would, however, have to be obtained from the owners, NATCOS, to use their infrastructure.

In addition, there is an existing 24-inch crude oil pipeline between the NATCOS tanks situated on site 1 and TFIT which could be used in "transfer service" from the berth to TFIT. The condition of the pipeline and feasibility of using it for this service need to be established during the study if, practicable.

New loading arms would have to be erected at berth 05, 06 07 or 08. These berths have the advantage of a shorter length of transfer pipelines to TFIT. Another advantage is that the transfer pipeline could be connected to the existing switching station situated adjacent (behind) to berths 06. Doing this would enable access to berths 06, 07 and 08 and the entire Island View back of port system (other oil company tanks). SAPREF currently operates berth infrastructure on behalf of the oil companies.

The P&ID for the switching manifold needs to be obtained from SAPREF to understand the routing functions and options of the switching manifold and the benefit that it could offer TFIT.

The LTPF report cites recommendations and decisions that needed to be taken with regards to which products to handle, i.e. D50, ULP95 or both. The imported volumes of JET fuel were demonstrated in the report being too low to be considered as an optional product. The cost realities are that handling more than one product or product grades require more infrastructure and hence has higher capex. The landscape may have changed since the time of the LTPF report compilation and the product mix to be handled by TFIT needs to be validated during the study.

Feeder pipelines will connect TFIT to the IVT terminal intake manifolds, from where it can access the MPP24 pipeline. The IVT Terminal will regard the feeder pipeline(s) as a client intake feeder pipeline(s) similar to the existing client feeder pipelines.

The research envisages that, the TFIT terminal can be configured to operate in three modes, namely,

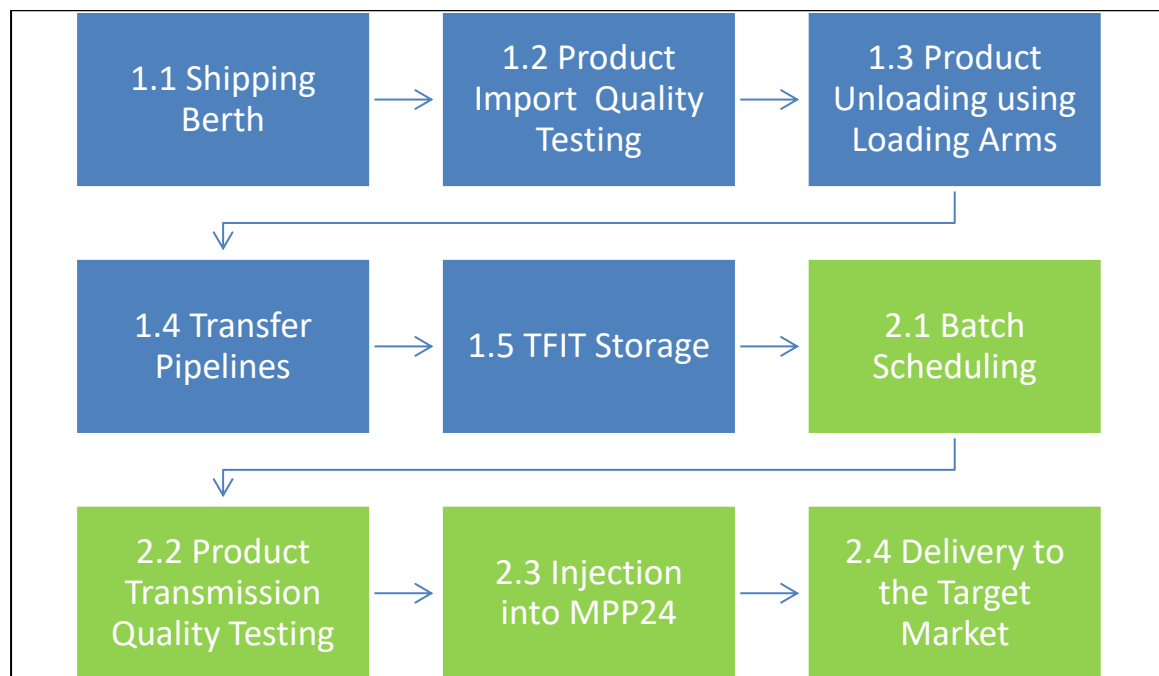
- a) In product import service and
- b) In TM1 accumulator service
- c) In both modes

Operating the TFIT in product accumulation service mode or both modes are not to be evaluated any further, as these modes will be impacted by the imminent construction of the IVT Accumulator Tanks.

7.2.4.2.1.4 Summary of Process Flow Requirements

A summary of the process flow for the operation at TFIT is simplified in Figure 07 below. The operation will involve two distinct product flow processes, namely the product flow from the assigned berths to the TFIT (termed the transfer operation) and, secondly, the product flow from the TFIT into the MPP24 (termed the feeder operation). The latter involves the consideration of TPL pipeline scheduling requirements.

Figure 07: TFIT Operation Process



As per the LTPF report, the calculated flow rate for the unloading or transfer operation is 2 000 m³/hour and for the injection or feeder operation is 1 200 m³/hour (+/-10%). The unloading flowrate is based on sufficient time to offload a fully laden ship of 43 000 m³ in 22 hours and is well within the berth occupation time constraint "laycan max time" of 36 hours.

The process flow diagrams for the concept options need to be defined and included in the final concept definition report.

The operation philosophy at a conceptual level for the TFIT in product import mode is to be developed and workshopped with the *Employer*. The operations philosophy is to cover the following sections at a minimum:

- a) Storage Tank Capacities,
- b) Product Allocation Philosophy,
- c) Bunding and containment Philosophy

- d) TFIT Operations Procedure,
- e) TFIT Operating Parameters and Battery Limits,
- f) Berth(s) Capacity Assessment,
- g) Product Import Operations Philosophy,
- h) Product Transfer and Metering Philosophy,
- i) Import Terminal Product Receiving Philosophy,
- j) Import Terminal Product Storage Philosophy,
- k) Storage Tank dewatering Philosophy,
- l) Product Sampling Philosophy,
- m) Import Terminal Product Dispatch Philosophy,
- n) Effluent Handling Philosophy,
- o) Stormwater Handling Philosophy,
- p) Fire Protection System Overview,

The operations philosophy report for the concept options needs to be defined and included in the final concept definition report. It is recommended that this section of the report be accepted as a separate submission to the final concept definition report and can be used as a "stand alone document" by the *Employer*.

7.2.4.2.2 Existing Infrastructure Assessment

7.2.4.2.2.1 Berthing Infrastructure

The existing berth 05 to 09 infrastructure needs to be assessed to confirm if the berths can accommodate a loading arm as well as any other modifications to the jetty. There is currently no loading arm at berth 05 at present, and the loading arm at berths 06, 07, 08 and 09 is currently owned by others, where permission to use the berth infrastructure needs to be arranged.

A detailed evaluation of the additional infrastructure that is required at the quayside to firm up an investment decision needs to be completed during the study.

7.2.4.2.2.2 Pipeline Routing Infrastructure

The pipeline routing from berth 05, 06, 07, 08 or 09 through to the TFIT will determine the authorisation required from the specific pipe rack owners and / or landowners for the laying of the transfer pipeline to the TFIT. The existing pipe racks were constructed by Engen but may have been transferred to TNPA and need to be confirmed during the study. The routing appears logical at face value, but should Engen not be amenable to the proposed routing, alternate routing options need to be investigated and proposed if possible.

7.2.4.2.2.3 Storage Tanks and Appurtenances

The three ex NATCOS storage tanks are in service since **circa 1969** and indications are that the tanks, bunds and all infrastructure within the tank bunds will be demolished and the site handed over to TPL "in a state that NATCOS received the site from Transnet before they developed the site"



All the above-mentioned factors need to be considered and included in the study.



7.2.4.2.2.4 Control Systems

The operation of the NATCOS site 2 was controlled from the NATCOS site 1, and thus the existing control system cannot be used to control TFIT as NATCOS site 1 will remain within the ownership and management of NATCOS.

The adjoining IVT Terminal owned and operated by TPL, has an existing control system that operates the existing IVT Terminal. The TFIT facility to be located on the NATCOS site 2 have as an option to use the existing IVT Terminal control system. New field instruments will however need to be specified, procured and installed. The conceptual designs, of which needs is to be included in the scope of the study. The controls' philosophy and architecture for the TFIT, will need to be detailed as a part of the study.

7.2.4.2.2.5 Site Services and Facilities

The existing pollution control infrastructure and storm water infrastructure appear to be functional but will be demolished by NATCOS. The site security and access control, fire protection systems, electrical, lighting, and Cathodic Protection Systems may not be functional, and hereto these site services have as an option to use (or parts thereof) the existing IVT services where available.

With regards to fire protection, the Cutler system covers the facility with emergency firefighting for major events.

The following site facilities are currently provided by NATCOS Site 1 and will not be available in the future, so they need to be catered for as a part of the TFIT project and considered in the designs and execution plans:

- a) Fire protection – initial response fire foam system,
- b) Electricity supply and distribution,
- c) Pollution equipment,
- d) Controls and Automation (SCADA),
- e) Cathodic Protection (CP).

The provision of these services needs to be established as a part of the next project phases as there is limited to no space to construct new buildings for services on site.

It is proposed that the Operating Entity should be **independent** of Transnet and implies that the TFIT should be self-sufficient and be independent from Transnet (including services). However, the site may need to be operated as a "satellite" facility from TPL's IVT depot, this being similar to how NATCOS currently operates the NATCOS Fynnlads Site 2 from the main site NATCOS Fynnlads Site 1.

All the above-mentioned items need to be verified during the study.

7.2.4.2.3 New Infrastructure Requirements

7.2.4.2.3.1 Storage Tanks and Appurtenances

With the existing NATCOS tanks being demolished, the study will have to establish the optimal tank storage capacity for the site, including optimal product allocation to cater for the sustainable operation of the new tank farm.

7.2.4.2.3.2 Marine Loading Arms

The existing berth 05 does not have a marine loading arm, with which the ships can be offloaded via the pumping of imported product to the transfer piping; thus, a new loading arm(s) and related ancillaries need to be specified, procured, and installed at berth 05.

Should berth 06, 07, 08, or 09 be selected as the preferred import berth, then a new marine loading arm(s) needs to be installed or arrangements need to be made with the owners to use their loading arms.

An audit of the equipment and infrastructure at the marine berths needs to be included in the study, as well as conceptual designs for the proposed equipment.

7.2.4.2.3.3 Transfer Pipeline

Based on the preliminary calculations conducted by the service providers that worked on the LTPF report, the product transfer operation will require at least an 18" diameter, API5L Class 150 rating-compliant pipeline. If berth 05 is selected as the preferred berth, the length of the pipeline is estimated at 2,330 m, which shall span from the back of the berth through to the intake manifold at the TFIT. These pipelines may need to include a manifold at the back of berth 05 as well as tie into the intake manifold at TFIT, along with the manifold infrastructure that shall support the manifold functionality.

Likewise, if berth 06, 07, 08, or 09 is selected as the preferred berth, a similar investigation and conceptual designs are to be developed. The size and routing of the pipelines need to be verified during the study.

7.2.4.2.3.4 Feeder Pipeline to MPP24

To facilitate the injection of the product into the MPP24 pipeline via TFIT, a new 500 meters long feeder pipeline will need to be constructed between the TFIT discharge manifold and the intake manifold of the IVT Terminal. Based on the current preliminary sizing calculation, it has been determined that the feeder pipeline will be at least an 18" diameter, API5L Class 150 rating compliant pipeline. The size and routing of the pipelines need to be verified during the study.

7.2.4.2.3.5 Discharge Manifold



A new discharge manifold, including a booster pump set will need to be designed and installed at the TFIT site. The manifold may include multiple pump sets that are dependent on the configuration of the TFIT. The discharge pump manifold needs to be configured for spill back, pump start-up, and other associated safety and product quality considerations.

7.2.4.2.4 Operations Requirement (Human Resources)

There is no Transnet labour involved with the current NATCOS site 2 and there is also no permanent NATCOS labour situated on the site or working from the site. There are also no facilities for workers on the site. It is assumed that NATCOS would retain their staff at Site 1 and there would be no takeover of staff from NATCOS. This needs to be considered and validated during the study.

The concept of an independent operating entity would need to be socialized amongst TPL labour to document its impact on them.

In addition, the operations requirement (Human Resources) needs to include for a conceptual shareholders agreement that needs to be written up front that defines the various requirements that Transnet and its partners would like to achieve with this venture, in respect of contribution to BBBEE, local labour and local Enterprise Development (ED) Supplier Development (SD) content, etc..

7.2.4.2.5 Rough Order of Magnitude Capex Cost Estimate (Theme 1)

The Rough Order of Magnitude (ROM) Capex Cost Estimates (**approximately 50% accuracy**) for the various themes are contained in the LTPF report. It is noteworthy that the costs are based on the Oil Industry Value Chain Optimisation and LTPF 2019 work, thus 2018 numbers escalated by 3 years. The capex for various pipelines, tanks, pumps and equipment was provided by AECOM, the technical advisor on the LTPF assignment. The cost estimate was compiled on the premise that major equipment items should be costed and summed including a large contingency to cater for the lack of details provided on the cost of the peripheral items, as is the case on a ROM estimate.

The areas of focus in the compilation of a more definitive cost estimate for each concept option is as follows:

- a) The evaluation of berth infrastructure and its costs.
- b) The establishment of the P&ID that will determine whether 1 pump set will be adequate for the operation.
- c) The cost estimate of the discharge manifold that appears significantly low in comparison to the Accumulator Tanks booster pump and discharge manifold as it is a large cost contributor to the estimate.
- d) The costs to provide the services, such as control system, fire protection, storm water, pollution control, cathodic protection, electrical & lighting.
- e) The flow rate of 2 000 m³/hour for the transfer and feeder pipelines as currently Engen and SAPREF are known to have berth pumping capacities of 850 m³/hour. The current feeder pipeline capability by SAPREF and Engen into the MPP24 pipeline is 1 200 m³/hour.



- f) The refurbishment costs of the civil infrastructure such as bundwalls, access roads, pipe sleepers etc..
- g) The environmental rehabilitation costs as applicable if not carried by NATCOS.
- h) The permitting and licencing costs.
- i) Commercial costs to include investigations such as market studies, project development models simulations, operating model development simulations.
- j) Design and engineering costs.

7.2.4.3 Commercial Work Stream

The commercial work stream is to primarily assess if there is a business need in the market for TFIT and if the need could result in the development of TFIT being commercially viable. The commercial workstream is to include validation of the analysis conducted as a part LTPF study by including the research desktop and stakeholder engagement research into the subsections as contained below.

7.2.4.3.1 Market Demand Analysis.

The study is to include a validation of the market demand analysis showing the historical volumes, and future forecasts over at least the next 20 years, including trends and scenarios of events or changes in the value chain that may impact the demand forecast.

7.2.4.3.2 TFIT Throughput Capacity

The ex NATCOS tanks have a nominal capacity of 32,568 m³ each. Assuming a working capacity of approximately 90% of the nominal capacity, or 29,400 m³ per tank, the throughput capacities per year can be estimated based either on tank turns per month or based on the number of Multi Range (MR Ship Size) ships per month.

The terminal throughput was calculated at being approximately 500 000 m³ per year based on a conservative throughput of one MR ship per month, at 1 tank turn per month. With the tank configuration changing, this needs to be validated as a part of the study.

7.2.4.3.3 Island View Fuels Berth Capacity

The report assessed the berth capacity at the Port of Durban. Berth capacity is cited as being important when considering future imports into the Port of Durban because berth size determines a maximum ship size which may affect the throughput of the terminal. The current estimate of terminal throughput of 500 000 m³ per year is based on one MR ship per month.

In addition, with the increase in imported volumes, caused by the closure of the 2 coastal refineries, namely SAPREF and ENREF being shipped via the same number of allotted shipping berths, the berthing capacities needs to be reviewed.

This needs to be validated as a part of the study and will require engagement with TNPA for confirmation of the berthing capacities.

7.2.4.3.4 TNPA Port Strategy

It is public knowledge that the TNPA Port of Durban Strategy, as contained in the Port of Durban Master Plan, indicates major changes to the IVT Terminal. The port strategy and the impact it may have on the TFIT project are critical to the longevity and viability of the TFIT. Early engagement with TNPA is essential for the continuation of the project. It may be prudent for the assessment of the TFIT to be aligned with the TNPA Port of Durban Strategy.

7.2.4.3.5 The SPV

TPL have decided that the development strategy of TFIT is that of co-development, initially from the feasibility phase through to the establishment of a project vehicle or SPV for the execution phase. It is recommended that a capable Transactional Advisor assist in the carrying out of this activity.

The selection of a suitable partner to participate in the SPV is to follow Transnet's Joint Investment Framework that is contained in Annexure A3.

The objective of the SPV is to establish and set up an appropriate partnership to give effect to the re-purposing NATCOS site 2 at Island View, to function as a bulk liquid fuel import facility focusing on introducing new HDSA entrants into the fuel logistics supply chain. This includes infrastructure such as Berth Loading Arms, connectivity between the TFIT Tanks and Berth 05 through to 09 and connectivity to MPP24 pipeline.

An overview of the SPV development model structure, roles and responsibilities, project development requirements, services and operating principles and markets served are contained in the LTPF report. The proposed SPV development model needs to be verified / updated and is to form a part of the scope of the study and is to be aligned to Transnet's Joint Investment Framework.

7.2.4.3.5.1 An Independent Operating Entity

It is envisaged that there shall be a link between the SPV and Independent Operating Entity, the details of which shall be conceptualised during the study and detailed during the feasibility and pre-implementation phase of the project. It is recommended that a capable Transactional Advisor assist in the carrying out of this activity.

The import facility will provide Island View storage and handling services to the market with the following proposed operating principles:

- a) The Operating Entity is envisaged as being independent, with its own corporate identity.
- b) The Operating Entity will employ its own resources and operate the terminal independently from Transnet and its partners.
- c) The Operating Entity being an independent terminal operator, will need to apply to NERSA for a storage and handling tariff, which will then generate the revenue that provides a reasonable return on investment for its shareholders.



- d) The facility will operate as a **throughput terminal, not a storage one**. That is, customers are expected to evacuate their product as soon as practicable. Any product storage longer than an agreed time period will attract additional fees and will be captured in a shippers agreement of some sort at start-up.
- e) The facility will operate as a Common User facility, providing access to multiple marketers on a first come first serve basis such as, take or pay contracts.
- f) Usage allocation and throughput targets will be subject to normal Common User principles, with rules for new entrants.
- g) The Operating Entity will schedule their own operations i.e. shipping discharge and MPP24 pipeline injections.

The proposed operating model as described in the LTPF report needs to be verified / updated and shall form a part of the scope of the study.

7.2.4.3.5.2 Potential Terminal Users Assessment

There have been numerous enquiries received by TPL about the imports of refined liquid fuels and some of them have shown a keen interest in participating in the development of the TFIT as a co-developer / Terminal user. At this stage it is mooted that the SPV Partners and the TFIT facility users are different entities. It is a key requirement of the study, this is confirmed during the study.

The study needs to include for formal engagement with the companies / entities and the development of a standard questionnaire aimed at soliciting the required information and screening of potential users of TFIT. All external engagement is to be documented and included in the final report as an Annexure to the report. Caution needs to be taken, so not to commit TPL or its potential partners in any way about a guarantee of participation in the TFIT development as the selection of the SPV partners and or Operating Entity partners will be procured through a transparent process.

The study also needs to include for a formal market enquiry through the *Employer's* procurement processes. An open market Expression of Interest (EOI) is an alternate option to compliantly obtain commitment from the market and is recommended to be included in the study. The Employer's procurement process needs to be followed when embarking on an EOI. The potential terminal users will include but not be limited to:

- a) Historically Disadvantaged South Africans (HDSA),
- b) Support to regional integration by creating an export channel e.g. Botswana imports,
- c) Clients to support sustainable volume flows through TFIT.

The *Consultant* is to make allowance for the entire procurement event for the EOI and provide for the technical resources to compile the functional requirements for the EOI as well as the procurement resources to compile the EOI tender document including the evaluation of the EOI and dissemination of its information to the *Employer's Agent* under this activity.

7.2.4.3.5.3 Current Market Competition Analysis.



There are currently direct competitors to the proposed TFIT and the TFIT offering needs to be priced competitively to the users of the facility. A basic competition analysis is contained in the LTPF report but may be outdated and may not have been exhaustive. The study needs to review the market competition analysis as contained in the LTPF report and validate the analysis. The study needs to research the major players in this sector of the market for confirmation that TFIT could be a viable investment for the developers.

7.2.4.3.5.4 Stakeholder Analysis.

A stakeholder analysis needs to be included in the study. The stakeholder analysis shall follow a methodical process to cover the pertinent sections of a market stakeholder analysis. The LTPF report cited the following key stakeholders:

- a) Transnet Pipelines,
- b) Strategic Fuel Fund (SFF),
- c) Transnet SOC,
- d) Central Energy Fund (CEF),
- e) Potential SPV Partners,
- f) Department of Transport (DOT),
- g) Department of Mineral Resources and Energy (DMRE),
- h) Department of Public Enterprises (DPE),
- i) Department of Environmental Affairs (DEA),
- j) SAPIA,
- k) TNPA,
- l) NERSA,

7.2.4.3.5.5 International Research and Benchmarking

The study will involve research on similar facilities built overseas, as well as their organised development and operation approaches. The study's goal is to examine the similarities and contrasts between their surroundings and offer standards or principles for employers to follow while developing TFIT. There should also be research on suboptimal or failing facilities. A quantitative and/or qualitative analysis will be carried out to capture the findings of the worldwide research and benchmarking effort.

7.2.4.3.5.6 Socio-economic assessment

A detailed socio-economic assessment of the TFIT project is to be researched during the study and is to include the following key areas of research:

- a) Contribution to Liquid Fuels Charter.
- b) Contribution to regional integration.
- c) Lowering cost of doing business in SA and the region.

7.2.4.4 Financial Work Stream

The financial work stream is to follow-on and interface with the commercial and operations & technical work stream and is to produce the financial viability metrics of the TFIT project including sensitivity analysis. The financial workstream is to include validation of the analysis conducted as a part of the LTPF study and is to cover the areas as contained below.

7.2.4.4.1 Financial History



There is currently no financial history available for the project as there is no known existing similar import facility located in the country. The current NATCOS site 2 facility is cost neutral to TPL, i.e. TPL leases the NATCOS site 2 from TNPA and TPL then leases the NATCOS site 2 back to NATCOS. In the absence of NATCOS occupying the site TPL will incur costs for TNPA lease and security costs – estimated at R1.729 million and R48 000 per month respectively. These costs will be incurred by TPL whether there are intentions by TPL to develop the TFIT or not.

The large operating cost items associated with the TFIT could include the following:

- a) Land lease costs from TNPA.
- b) Security costs for the protection of the assets at the site and the ingress and egress at the site.
- c) The costs for the operating of the site.
- d) The surveyor cost associated with the import of product activity.
- e) Associated operator / maintainer costs.
- f) Electricity and energy costs for the operating of the facility.

7.2.4.4.2 Tariff Model and Structure.

The TFIT storage Capex and Opex is segregated from the berth and transfer pipeline Capex and Opex because the two activities fall in separate sections of the liquid fuels value chain as regulated by NERSA. The 2 distinct value add services will receive a return on investment and SPV / Operating Entity needs to be apply to NERSA for a commensurate tariff that shall be relative to its capital and operating components.

7.2.4.4.2.1 Berth Development and Transfer Pipeline Tariff Separation

The berth development and transfer pipeline cost will include all capital costs for berth development and transfer pipelines from the berths to the TFIT site. The loading facility is defined in the Petroleum Pipelines Act. 60 of 2003 as follows:

"loading facility" means any marine facility that is or can be used to load or off-load petroleum and includes any auxiliary pipelines connected thereto but excludes bunkering facilities"

The TFIT storage costs shall include the costs for the construction of all infrastructure situated at the NATCOS site 2 as well as the feeder pipelines from the TFIT site into the intake manifold of the IVT Accumulator Terminal.

Separate tariffs are to be calculated for both parts of the value chain. The tariff structure is to be researched and documented as it could inform options or permutations of how best to structure the battery limits of the various participants in the operating entity and their roles and responsibilities during operations.

7.2.4.4.3 Throughput versus Rental Storage Tariff

The calculations of tariffs are available on request from NERSA. In summary, owners of storage tanks apply for and NERSA approves a maximum tariff to charge for customers wishing



to use the facilities. The NERSA methodology uses a formulated approach to derive allowable revenue (AR) for the facility owner/operator which is based on the asset base, working capital, operational expenses, tax and depreciation.

The basis of the tariff calculation is as follows:

Allowable Revenue AR = (RAB + working capital)* WACC + E + D + T +/- C where

RAB = Regulatory asset base

WACC = weighted average cost of capital

E = operating expenses

D = depreciation

T = tax

C = Clawback adjustments for difference in actuals versus forecasts

7.2.4.4.3.1 Throughput Tariff

The throughput tariff is calculated by dividing the AR by the throughput in litres to get cost expressed in cents per litre. The customer pays according to the volume of product he / she pushes through the facility per month. If the product remains in storage for longer than a month, additional costs are normally levied for that product to encourage the cargo owner to evacuate the product timeously.

7.2.4.4.3.2 Rental Tariff

Alternatively, a rental tariff is calculated by dividing the AR by the capacity of the terminal and the number of months in a year (12) to get Rand per m³ per month. In this case, customers rent a specified volume of storage and pays for this on a take or pay basis. The owner-operator is therefore guaranteed the rental irrespective of whether the cargo owner uses the space or not. The cargo owner benefits in that he can push through higher volumes of product at a constant rental cost.

NERSA allows either of the tariffs, so it's the applicant who decides what tariff they want to apply for.

7.2.4.4.4 Financial Models.

Financial models were run for the various themes as detailed in the LTPF report and the financial models for the various options need to be updated and verified during the study.

7.2.4.4.5 Project Funding Strategy

The consultant needs to research project funding strategies and document possible funding strategies available to the *Employer*.

7.2.4.5 Concept Options Definition Report

The concept options definition activity is to be documented in a report that covers the definition as covered in the work streams for each option described in the sections above. The outcome of the activity is to be workshopped with the *Employer's* project team and any recommendations, changes is to be considered by the *Consultant* and the report updated accordingly. The final report is to be submitted by the *Consultant* to the *Employer* for approval.

7.2.5 Concept Options Finalisation and Approval

After the pre-screening process described in the previous part is finished, the remaining alternatives need to be grouped and put into a report called Concept alternatives Finalisation report. The report must contain all relevant information that was covered in the earlier activities in order to ensure that all the specifics are covered until the optioneering or final option assessment and selection phase. The consultant will facilitate a presentation of the concept option finalisation results to the employer's leadership team, and will also facilitate an update to the report following the presentation.

The final concept options finalisation report is to be submitted by the *Consultant* to the *Employer* for approval.

7.2.6 Permit Application

Based on the permitting requirements assessment carried out in the sections above and the *Employer's* view of the likely permitting requirements the *Consultant* is to include in the scope of the contract the following:

- a) The commencement and early works of the permit application processes for the Environmental Authorizations as this is likely to fall on the critical path to project commissioning. The following sub activities needs to be included under this activity:
 - i. Generate a screening report by the appointed Environmental Assessment Practitioner,
 - ii. Conduct Environmental Specialist Studies,
 - iii. Submit applications for Environmental Permits/ Licenses,
 - iv. Notification of Competent Authority decision and appeals process.

The *Consultant* is to submit a Report on this activity to the *Employer* for approval.

7.2.7 Completion of Project Charter

The Consultant is to compile and submit to the *Employer* a Project Charter that summarises the investment case on the services carried out during the concept phase by the *Consultant*.

The Project Charter is to be presented to the Project Steering Committee and on approval shall endorse the completion of the Concept Phase of the project. Annexure C contains a template that the Consultant is to use as a guideline upon which the Project Charter is to be compiled. It shall be the responsibility of the *Employer's Agent* to obtain approval of the



Project Charter, but the *Consultant* is to provide a supporting role to field any queries that may be received by the *Employer* in respect of the Project Charter.

7.3 The Prefeasibility phase,

The prefeasibility phase of the study is to follow on from the completion of the concept phase of the study. The primary aim during the prefeasibility phase is to methodically evaluate the shortlisted options detailed in the concept phase by selecting the appropriate selection criteria, weighting these selected criteria, scoring the options against the criteria and eventually selecting the best option for further development during the subsequent feasibility phase of the project.

This phase includes for the development of the feasibility phase planning documentation that shall be sufficiently detailed to successfully negotiate a prefeasibility phase gate review at the end of the study. The *Employer's* desired outcome at the end of the prefeasibility phase is compilation of a business case that shall be routed by the *Employer* for the release of the Feasibility phase funds.

7.3.1 Prefeasibility Study plan update

A prefeasibility phase kick-off meeting is the first activity of the prefeasibility phase and is intended to update the study plans and deliverables in view of the completion of the concept phase. The study plan update is to be included in the kick-off meeting as an agenda item and is to include the following key points of discussion:

- a) An update of the sub-activity list with descriptions of the sub-activities until study completion.
- b) An update of the program with key milestone dates.
- c) An update of the requirements of the project owners' teams and other stakeholders on reviews, signoffs, and approvals.
- d) Clarifications and questions.
- e) An update of the fortnightly meeting and reporting requirements.
- f) Key study risks, issues, etc..

The prefeasibility phase study management plan is to be compiled and submitted by the *Consultant* for the *Employer's* approval.

7.3.2 Multi Criteria Assessment (MCA) of shortlisted options

Under this section, the *Consultant* is to undertake a Multi Criteria Analysis or Multi Criteria Decision Analysis to establish the most optimal concept option for further detailing during the feasibility phase of the project.

The Multi-Criteria Analysis (MCA) is to be used to compare the different concept options by assessing their effects, performance, impacts, and trade-offs to the TFIT. The MCA is to provide a systematic approach to support and document the decisions taken by the project team based on the concept options that were shortlisted. It is desired by the *Employer* that a single "go-forward" concept options be selected during the MCA.

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The *Consultant* is to use available tools at their disposal to finalise the multi criteria to be used for analysis. The finalised multi criteria that is to be used for analysis is to be accepted by the *Employer* prior to the options being assessed by the combined project and owners' teams.

The following are criteria that is considered by the *Employer* as relevant criteria for inclusion in the MCA process:

7.3.2.1 Strategic Objective Alignment Impact

This criterion is to evaluate the options alignment to the TPL strategy and is to consider the following:

- a) Review and alignment to the TPL corporate plan,
- b) Impact of the TNPA IVT strategy on the project and options.
- c) Other items affecting the project execution options alignment to TPL Strategy.

7.3.2.2 Operations and Maintenance Impact

This criterion is to evaluate the options from an operations and maintenance perspective and is to include the following considerations:

- a) Product contamination probability.
- b) Return off off-spec product requirements.
- c) Automated /Semi Automated / Manual operation.
- d) Value chain impact – Assessment of movement of molecule from downstream aggregator into the TPL IVT Accumulator Terminal for the applicable option.
- e) Value chain impact – Assessment of the movement of molecule from TPL IVT Accumulator Terminal dispatch manifold to forecourt (TLR versus JMP versus another) for the applicable option.
- f) Other items affecting the Operations and Maintenance of the Terminal.

7.3.2.3 Security of Supply Impact

This criterion is to evaluate the options from a Security of Supply perspective and is to include the following considerations:

- a) The number of days of stock for a particular option including the number of product grades that stock could be held at the Terminal.
- b) Other items affecting the Security of Supply mandate.

7.3.2.4 Design Impact

This criterion is to evaluate the options from a design impact perspective and is to include the following considerations:

- a) The extent of design works, and the impact of the design works on the cost and schedule.
- b) The process, technical and operational limitations or constraints of a concept option.



- c) The control system limitations or constraints of a concept option. This is to also include changes that are required to be made to the control system to incorporate the TFIT control system.
- d) Impact of new equipment / systems to the designs.
- e) Other items affecting the design works.

7.3.2.5 Construction Impact

This criterion is to evaluate the options from a construction perspective and is to include the following considerations:

- a) The ease of constructability of the options within the IVT Terminal, within the port and the existing site 2.
- b) The options impact of future construction in an operating plant, should the phased approach be adopted.
- c) Other items affecting the construction of the Terminal.

7.3.2.6 Regulatory & Compliance Impact

This criterion is to evaluate the options from and Regulatory and Compliance perspective and is to include the following considerations:

- a) The NERSA construction and operating license impact.
- b) The impact of sharing an Asset Base (AB) in the storage and pipeline tariff structure of the Pipeline Act.
- c) The impact of the options on the existing Section 79 approval and the amendment thereof.
- d) The process to be followed for approval from TNPA to operate a loading arm at the berth.
- e) The impact on the environmental authorisation and permitting requirements.
- f) Other items affecting regulation and compliance of the Terminal.

7.3.2.7 Financial Impact

This criterion is to evaluate the options from and financial perspective and is to include the following considerations:

- a) Cost
 - i. ETC of project option,
 - ii. Investment metrics, WACC, IRR, etc.
 - iii. Tariff impact + Impact of project option on pipeline versus road i.e. remaining competitive with road transport.
- b) Viability
 - i. Payback period
 - ii. Throughput forecast
 - iii. Refurbishing existing assets versus demolish and build new assets.
- c) Other items affecting financial aspects of the project.

7.3.2.8 Commercial Impact

This criterion is to evaluate the options from a commercial perspective and is to include the following considerations:

- a) Impact on market players:
 - i. Refineries
 - ii. Importers
 - iii. IOC's
 - iv. Etc.
- b) Response from market players:
 - i. Refineries
 - ii. Importers
 - iii. IOC's
 - iv. Etc.
- c) Funding Options / Strategy,
- d) Other items affecting commercial aspects of the project.

7.3.2.9 Schedule Impact (duration)

This criterion is to evaluate the options from a scheduling perspective and is to include the following considerations:

- a) Impact on projected completion dates,
- b) Other items affecting scheduling aspects of the project.

7.3.2.10 Risks & Issues of options

This criterion is to evaluate the options from a risk and issues perspective and is to include the following considerations:

- a) List potential risks of each option with viable mitigations if possible,
- b) List issues of each option with viable mitigation strategies if possible,
- c) List critical success factors and or fatal flaws of the concept options,
- d) Other items affecting the risks and issues aspects of the project.

Any other criterion that is deemed significant for the evaluation of the concept options.

7.3.3 Preferred option finalisation and approval,

The Consultant is to compile a report for review and acceptance by the *Employer* on the outcome of the multi criteria assessment and options screening process.

The preferred option is to be then presented to the *Employer's* leadership team in a maximum 3-hour meeting for their review and comments. A presentation (MS Power Point) is to articulate the process followed for the multi criteria assessment and option screening process.

Subsequently, the final report on the multi criteria assessment and options screening process is to be updated and submitted to the *Employer* by the *Consultant* incorporating the outcome of the workshops and presentations to the *Employer's* leadership team.

7.3.4 Gate review documentation preparation,

The *Employer* has chosen the Transnet PLP domain deliverable matrix to ensure that the applicable documentation for the study is developed to the minimum requisite level of completeness. This is to include for completion of the engineering documentation for the various engineering disciplines including process engineering, layout, civil engineering, structural engineering, mechanical engineering, piping, electrical engineering and instrumentation. The details requirements per engineering discipline is contained in the sections below under the specific engineering domains.

The Transnet PLP process is to be followed to ensure that all aspects of the project are adequately defined to progress from one project phase to the next. The gate review requirements contained in Annexure B for the prefeasibility phase is to be used as an indicative guide for the *Consultant* in respect of the level of details and completeness required of the project documentation for the study.

In preparation of the Prefeasibility Phase gate review, the applicable PLP deliverables are to be compiled, collated and submitted to the Gate Review team for their review. The applicable PLP Domains for the Prefeasibility Phase Gate Review are tabulated below with the detailed gate review requirements for each domain contained in the sections below.

Table 08: Applicable PLP Domains for the BFS Gate Review

DOMAIN NO.	PLP DOMAIN	DOMAIN NO.	PLP DOMAIN
1.	Execution Planning	2.	Health & Safety
3.	Environmental & Community	4.	Process (Engineering)
5.	Layout	6.	Civil (Engineering)
7.	Structures	8.	Mechanical (Engineering)
9.	Piping	10.	Electrical (Engineering)
11.	Port and Marine	12.	Metering Control & Instrumentation or Systems Process and Controls (SPC)
13.	Risk Management	14.	Schedule
15.	Cost	16.	Procurement
17.	Quality	18.	Operational Readiness
19.	Owners Requirement Specification (ORS)	20.	Business Case and Financial Model
21.	Facilities		

7.3.4.1 Project Management domain documentation preparation,

The Consultant is to prepare the various project management documentation for submission to the gate review committee. The specifics and details per project management domain are contained below:

7.3.4.1.1 Execution planning (1) documentation preparation,

The Consultant is to prepare a Project Execution Plan (PEP) report covering the items described below. The detail requirements are contained in Annexure B1:

- a) ORS – description outlined in body of report and complete document attached as an Annexure to the PEP,

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- b) Project Set up description,
- c) Scope of facilities description,
- d) Owner interfaces description,
- e) Contracting strategies – outlined in body of report,
- f) Quality plan - description outlined in body of report and complete document attached as an Annexure to the PEP,
- g) Organisational plan description,
- h) H&S management plan– description outlined in body of report and complete document attached as an Annexure to the PEP,
- i) Environmental and Social plan – description outlined in body of report and complete document attached as an Annexure to the PEP,
- j) Compliance with statutory requirements– outlined in body of report,
- k) Engineering plan – description outlined in body of report and complete document attached as an Annexure to the PEP,
- l) Procurement and contracting plan – description outlined in body of report and complete document attached as an Annexure to the PEP,
- m) Labour studies description,
- n) Logistics studies description,
- o) Construction plan – description outlined in body of report and complete document attached as an Annexure to the PEP,
- p) Cost and schedule management plan,
- q) Lessons learnt from previous projects.

The Consultant is to submit all relevant documentation developed to the *Employer* for the *Employer's* approval or acceptance, as applicable.

7.3.4.1.2 Health and Safety Management Plan (2) preparation,

The Consultant is to prepare a Health and Safety Management Plan report covering the items described in Annexure B2 and submit all the relevant documentation to the *Employer* for approval or acceptance, as applicable.

7.3.4.1.3 Environmental and Social Governance Management Plan (3) preparation,

The Consultant is to prepare an Environmental and Social Governance Management Plan report covering the items described in Annexure B3 and submit all the relevant documentation to the *Employer* for approval or acceptance, as applicable.

7.3.4.1.4 Risk Management Plan (13) preparation,

The Consultant is to prepare a Risk Management Plan report covering the items described in Annexure B13 and submit all the relevant documentation to the *Employer* for approval or acceptance, as applicable.

7.3.4.1.5 Schedule (14) preparation,



The Consultant is to prepare a Schedule covering the items described in Annexure B14 and submit all the relevant documentation to the *Employer* for approval or acceptance, as applicable.

7.3.4.1.6 Cost Estimate (15) preparation,

The Consultant is to prepare a Cost Estimate covering the items described in Annexure B15 and submit all the relevant documentation to the *Employer* for approval or acceptance, as applicable.

7.3.4.1.7 Procurement Management Plan (16) preparation,

The Consultant is to prepare a Procurement Management Plan report covering the items described in Annexure B16 and submit all the relevant documentation to the *Employer* for approval or acceptance, as applicable.

7.3.4.1.8 Quality Management Plan (17) preparation,

The Consultant is to prepare a Quality Management Plan report covering the items described in Annexure B17 and submit all the relevant documentation to the *Employer* for approval or acceptance, as applicable.

7.3.4.1.9 Operational Readiness Plan (18) preparation,

The Consultant is to prepare Operational Readiness Plan report covering the items described in Annexure B18 and submit all the relevant documentation to the *Employer* for approval or acceptance, as applicable.

7.3.4.2 Engineering domain documentation preparation,

The Consultant is to prepare an Engineering Report containing the various Engineering documentation for submission to the gate review committee. The specifics and details per Engineering discipline are contained below:

7.3.4.2.1 Process Engineering (4) documentation preparation,

The Consultant is to prepare the Process Engineering documentation covering the items described below. The detail requirements are contained in Annexure B4:

- a) Process design basis description,
- b) Facility capacity analysis description,
- c) Process design criteria,
- d) Block flow diagrams,
- e) Process flow diagrams,
- f) Piping and Instrumentation diagrams,
- g) Process Equipment calculations,

- h) Process line list,
- i) Process description.

The Consultant is to submit all relevant documentation developed to the *Employer* for the Employer's approval or acceptance, as applicable.

7.3.4.2.2 Layout (5) documentation preparation,

The Consultant is to prepare the Layout documentation covering the items described below. The detail requirements are contained in Annexure B5:

- a) Facility location / site selection,
- b) Site plot plan,
- c) Layout design criteria,
- d) Facilities layout,
- e) Facility / Area General Arrangement.

The Consultant is to submit all relevant documentation developed, to the *Employer* for the Employer's approval or acceptance, as applicable.

7.3.4.2.3 Civil Engineering (6) documentation preparation,

The Consultant is to prepare the Civil Engineering documentation covering the items described below. The detail requirements are contained in Annexure B6:

- a) Property impacts description,
- b) Geotechnical data,
- c) Civil design criteria,
- d) Site conditions including topographical data,
- e) Digital terrain model,
- f) Hydrology assessment,
- g) Bulk earthworks,
- h) MTOs' / BOQs'.

The Consultant is to submit all relevant documentation developed, to the *Employer* for the Employer's approval or acceptance, as applicable.

7.3.4.2.4 Structural Engineering (7) documentation preparation,

The Consultant is to prepare the Structural Engineering documentation covering the items described below. The detail requirements are contained in Annexure B7:

- a) Foundation concepts,
- b) Structural concepts,
- c) Standard specifications and drawings,
- d) Structural design criteria,
- e) Corrosion protection,
- f) Structural design,
- g) Structures contained in the model,



h) MTOs' / BOQs'.

The Consultant is to submit all relevant documentation developed, to the *Employer* for the Employer's approval or acceptance, as applicable.

7.3.4.2.5 Mechanical Engineering (8) documentation preparation,

The Consultant is to prepare the Mechanical Engineering documentation covering the items described below. The detail requirements are contained in Annexure B8:

- a) Mechanical design criteria,
- b) Mechanical deliverables list,
- c) Mechanical equipment list (including the storage tanks),
- d) Mechanical calculations,
- e) Equipment data sheets (Long lead items),
- f) Equipment specifications,
- g) Mechanical equipment contained in the model,
- h) MTOs' / BOQs',
- i) Mechanical demolition drawings,
- j) Mechanical tie-in lists.

The Consultant is to submit all relevant documentation developed, to the *Employer* for the Employer's approval or acceptance, as applicable.

7.3.4.2.6 Piping / Pipelines (9) documentation preparation,

The Consultant is to prepare the Piping / Pipelines documentation covering the items described below. The detail requirements are contained in Annexure B9:

- a) P&ID's and PFD's,
- b) Design criteria,
- c) Piping / Pipeline specifications / Data sheets,
- d) Piping material classes,
- e) Piping standard details,
- f) Piping tie-in schedules,
- g) Piping equipment contained in the model,
- h) Piping calculations,
- i) MTOs' / BOQs'.

The Consultant is to submit all relevant documentation developed, to the *Employer* for the Employer's approval or acceptance, as applicable.

7.3.4.2.7 Electrical Engineering (10) documentation preparation,

The Consultant is to prepare the Electrical documentation covering the items described below. The detail requirements are contained in Annexure B10:

- a) Electrical Design criteria,
- b) Electrical Equipment list,



- c) Equipment Specifications,
- d) Equipment Data sheets (Long lead items),
- e) Electrical calculations,
- f) Single Line diagrams,
- g) Connected load list including motor list,
- h) Schematic diagrams,
- i) Electrical raceway and cable ladder routing,
- j) Main underground system routes,
- k) Electrical equipment contained in the model,
- l) MTOs' / BOQs'.

The Consultant is to submit all relevant documentation developed, to the *Employer* for the Employer's approval or acceptance, as applicable.

7.3.4.2.8 Port and Marine (11) documentation preparation,

The Consultant is to prepare the Port and Marine documentation covering the items described below. The detail requirements are contained in Annexure B11:

- a) Digital Terrain Model and Bathymetry,
- b) Design Vessel Criteria,
- c) Port Layout Design Criteria,
- d) Terminal Layout and Logistics Modelling
- e) Warves, Jetties and other marine Infrastructure,
- f) MTOs' / BOQs'.

The Consultant is to submit all relevant documentation developed, to the *Employer* for the Employer's approval or acceptance, as applicable.

7.3.4.2.9 Metering Control & Instrumentation (12) documentation preparation,

The Consultant is to prepare the Metering Control & Instrumentation documentation covering the items described below. The detail requirements are contained in Annexure B12:

- a) Facility control philosophy,
- b) Facility Functional Description,
- c) Facility Controls Specifications,
- d) Control System Architecture
- e) Instrument Specifications,
- f) Cable Schedule,
- g) Instrument List,
- h) Instrument data sheets,
- i) Valve control list.

The Consultant is to submit all relevant documentation developed, to the *Employer* for the Employer's approval or acceptance, as applicable.

7.3.5 Prefeasibility phase Gate Review,



The Consultant is to participate in the Prefeasibility Phase gate review by carrying out the following:

- a) Assist the Employer in the finalisation of the Prefeasibility Phase gate review documentation. The detailed gate review deliverables are contained in Annexure B.
- b) Present the Prefeasibility Phase PLP deliverables to the Gate review team during the Prefeasibility Phase gate review meeting,
- c) Revise and resubmit the Prefeasibility Phase gate review documents as required by the Prefeasibility Phase gate review team. Present the resubmitted documents to the gate review team as required.

The Prefeasibility Phase gate review shall be convened in a manner such that an independent team of Subject Matter Experts, that are usually in the Employ of Transnet Operating Divisions, other than TPL, shall review the documentation prepared by the combined *Employer* and *Consultant* project team. The documentation that is to be reviewed shall be regarded as a representation of the project readiness for the project to proceed to next PLP phase being the project Feasibility Phase. The applicable PLP Domains for the Prefeasibility Phase Gate Review are contained in Appendix B.

It is noteworthy that the relevant gate review documentation is to be submitted to the gate Review committee 14 days prior to the gate review and this should be allowed for in the Consultants study plan.

7.3.6 Compile final project technical specifications

The *Consultant* is to review the deliverables of the gate review and other documentation and prepare a comprehensive suite of project specifications to be used for the design and construction of the works on the project. It is the *Employers* intention to execute the project via an EPC contracting strategy, thus the specifications need to be developed to suite the EPC contracting strategy. The specifications are to include, but not limited to the following:

- a) All civil engineering specifications,
- b) All geotechnical and structural specifications,
- c) All marine specifications,
- d) All mechanical and piping specifications,
- e) All electrical specifications,
- f) All metering control and instrumentation specifications,
- g) All fire system specifications,
- h) All security system specifications.

7.3.7 Prepare Technical Tender Documentation for an EPC Contractor

The *Employer's* intention is to get the remainder of the project executed through an EPC contract where the appointed Contractor would design, procure, manufacture, deliver to site, install, commission and close out the works on the project. The *Consultant* is to prepare the EPC tailored technical documentation including the following in accordance with the NEC3 ECC suite of contracts:



TENDER NUMBER: TPL/2024/08/0003/73198/RFP

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- a) C2.0. Pricing Data.
- b) C3.0. Works Information including all technical and other specifications.
- c) C4.0. Site Information.

The *Consultant* is to also prepare the following tender documentation in accordance with the CiDB tendering process.

- a) Tender eligibility criteria.
- b) Tender technical / functional returnables criteria.
- c) Technical scorecard

The technical tender documentation is to be submitted by the *Consultant* to the *Employer* for approval.

7.3.8 External Partner Selection.

The process for the selection of appropriate co-development partner will be determined by the Joint Investment Framework contained in Annexure A3. The study needs to develop an RFP document in accordance with the Joint Investment Framework. It is envisaged that the end of study deliverable would include for the approval of the Transnet BoD of an external partner for the subsequent feasibility and execution phases of the project.

7.3.9 Business case compilation

The business case is to include a summary of pertinent aspects of the study. This deliverable is the responsibility of the *Employer's* Project Management Team. The *Consultant* is to provide support to the *Employer's* Project Management Team as required.

7.3.10 Study close out.

The extent of the study is to be documented in a study close out report and should document a detailed account of the study, where all the pertinent information is captured in the report and or its Annexures. The report is to be compiled in a manner, such that a reader after reviewing the study close out report would be able to understand the activities that was completed during the study.

One of the primary objectives of the study close out report is for it to be a single input document for the onset of the feasibility phase of the project for further refinement and development during the project's feasibility phase.

The study close out activity is to also include for the handover of all the relevant documentation to the *Employer* for use during the subsequent Feasibility Phase of the project. The close-out of the study is to include but not limited to the following tasks:

- a) All drawings and documentation developed, reviewed or updated during the study, is be handed over to the *Employer* in native and PDF format,
- b) The 3D model for the facility or terminal in its native or editable format, is to be handed over to the *Employer*.
- c) All commercial and contractual documentation generated during the study is to be handed over to the *Employer* in native and PDF format.

The study close out report is to be submitted by the *Consultant* to the *Employer* for approval and its approval will mark the end of the study phase.

8 SPECIFICATIONS AND STANDARDS

Specifications forms part of Annexure D.

9 DRAWINGS

Drawings forms part of Annexure A.

10 GENERAL

10.1 Missing Specifications, Data Sheets, etc.

Should the Consultant identify documents that are not supplied in Annexure A, this should be brought to the Employer's attention so that such documents can be supplied where applicable. The Consultant shall obtain and use the latest version of published specifications, as the *Employer* will not supply any specifications subject to copyright.

10.2 Deviations from Specifications

The Consultant shall bring to the *Employer's* attention any discrepancy found in the documentation. Any proposed deviations which, in the opinion of the Consultant, may result in a technical or commercial benefit to the *Employer*, shall be identified and submitted to the *Employer* as a supplementary proposal.

All deviations and/or exceptions to the requirements of this tender documents shall be identified as part of the tender documentation. Extras to contract resulting from deviations and/or exceptions that are NOT highlighted as part of the tender documentation and agreed to prior to Contract award shall be rejected.

All deviations and/or exceptions to the requirements of documents shall be identified as part of the Compensation Event procedure. Any Compensation Events resulting from deviations and/or exceptions that are NOT highlighted as part of the tender documentation and agreed to prior to Contract award shall be rejected.

11 MANAGEMENT AND START UP

It is the *Employer's* specific intention that the Consultant and their agents use the techniques of partnering to manage the contract by holding meetings designed to pro-actively and jointly manage the administration of the contract with the objective of minimising the adverse effects of risks and surprises to both parties.



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11.1 Types of Management meetings

Regular meetings of a general nature may be convened and chaired by the *Employer's Agent* or his delegated representative as contained in the table overleaf:

Table 09: Summary of meetings requirements

Title and purpose	Approximate time & interval	Location	Attendance by:
Overall progress and feedback meeting	Fortnightly. Day and time to be agreed.	<i>Employer's Office or MS Teams as required</i>	<i>Employer's Agent (and appropriate delegates), and Consultant (appropriate key persons)</i>
Monthly progress and feedback meeting	Monthly, day and time to be agreed.	<i>Employer's Office or MS Teams as required</i>	<i>Employer's Agent (and appropriate delegates), and Consultant (appropriate key persons)</i>
Contract status meeting	Fortnightly. Day and time to be agreed.	<i>Employer's Office or MS Teams as required</i>	<i>Employer's Agent (and appropriate delegates), and Consultant (appropriate key persons)</i>
Risk Management Meeting	Monthly on day and time to be agreed.	<i>Employer's Office or MS Teams as required</i>	<i>Employer's Agent (and appropriate delegates), and Consultant (appropriate key persons)</i>
Technical and / or Design review meetings & workshops	As required. Day and time to be agreed.	<i>Employer's Office or MS Teams as required</i>	<i>Employer's Agent (and appropriate delegates), and Consultant (appropriate key persons)]</i>

Meetings of a specialist nature may be convened as specified elsewhere in this Scope. Records of these meetings shall be submitted to the *Employer's Agent* by the person convening the meeting.

All meetings shall be recorded using minutes and an attendance register prepared and circulated by the person who convened the meeting. Such minutes shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the conditions of contract to carry out such actions or instructions.

The Consultant attends management meetings at the *Employer's Agent's* request as set out above. At these meetings the Consultant presents all relevant data including safety, health and environmental issues, progress reports, quality plans, sub-consultant management reports, as may be required.



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11.2 Gate Review Deliverables Checklist

The Gate Review deliverables forms part of Annexure B

11.3 Documentation Control

11.3.1 General

- a) In undertaking the services all documentation requirements for the services (including all incidental services required), shall be dealt with as per the document management and plans approved during the study.
- b) The control, maintenance and handling of documents and drawings, using an adequate and suitable electronic document management system, remain the sole responsibility of the Consultant.
- c) Each supplier of documentation and data to the project is responsible for ensuring that all documentation and data submitted conforms to the project standards and data quality requirements in terms of numbering (SYS-P-0001 Rev 0A), uniqueness, quality, accuracy, format, completeness of information. Data not meeting the project standards and data quality requirements will be cause for rejection and returned to the Consultant for corrective action and re-submission.
- d) All drawings supplied shall comply with the TPL Drawing Standards, contained in Annexure D.
- e) The Consultant is to ensure that the latest versions of the required application software and suitable IT Infrastructure are in place to support the electronic transmission of documentation.
- f) Electronic files submitted to the project shall be clear of known viruses and extraneous "macros". The supplier of documentation is required to have, at all times, the latest generation of virus protection software and up-to-date virus definitions.
- g) Ownership of data, designs and documents - The parties agree that copyright in the data, design and documents should, after payments by the *Employer* of the services to the Consultant, lie with the *Employer* subject to the *Employer's* indemnification against any claim from any party that may arise as a result of the Employer's use of such a document due to the Consultant's infringement of copyright.
- h) The Consultant shall be responsible for the supply of all 3rd party documentation and data related to their package of services, and shall ensure that these Sub-Suppliers have the capability to supply the necessary documentation and data in the required time-frame and quality as outlined in the specified standards prior to awarding sub-orders/contracts.
- i) Final issues of all documentation shall be supplied to in the corresponding electronic 'native files' and PDF renditions.

11.3.2 Procedure for Submission and Acceptance of Consultant's Documentation

- a) The Consultant's documentation shall be issued to the Employer's Agent under cover of a transmittal note indicating all references including the document numbers,

revision numbers, title and the chronological listing of transmitted documentation. Formats of Consultant data submitted is dependent on the project procedure and shall be specified by the Employer's Agent, upon the notified request of the Consultant.

12 HSEQ REQUIREMENTS

12.1 Health and Safety Requirements

- a) The service provider shall at all times comply with Safety, Health and Environmental requirements prescribed by the relevant legislation as well as the Transnet Contractor Management Procedure (TIMS-GRP-PROC-014) contained in Annexure D, as they may apply to the scope of services.
- b) The service provider performs duties of the employer and is in every respect responsible for compliance with the provisions of the act. The service provider will be responsible for the safety, health and environmental rules that TPL may require to be implemented.
- c) The service provider shall ensure that no employees or persons working on his/her behalf are allowed to enter any TPL site, unless that employee or person has undergone safety, health and environmental induction pertaining to the hazards prevalent to the site at the time of entry.
- d) Where applicable, the service provider shall ensure that all employees working on site have valid medical certificates of fitness specific to the scope of work to be performed and issued by an occupational health practitioner. Before establishing or entering any Transnet site, the contractor shall submit a Safety, Health and Environmental Compliance file for review and approval by TPL. The submission requirements will be aligned to the scope of services of the contractor."
- e) The *Consultant* shall comply with the Health and Safety requirements contained in the Contractor Health and Safety Specification Guideline (TRN-IMS-GRP-GDL-014.3) contained in Annexure D (The successful *Consultant* will review this document and update the document to be project specific for later use on the project.) The *Consultant* shall ensure that contractors and sub-contractors comply with the updated version of this specification as required.
- f) The *Consultant* should comply with all applicable legislation, regulations issued in terms thereof and Transnet's safety rules which should be entirely at the *Consultant's* cost and which should be deemed to have been allowed for in the rates and prices.
- g) The *Consultant* shall comply with the following Acts:
 - i. The Compensation for Occupational Injuries and Diseases Act, No.130 of 1993. The Consultant shall produce proof of his registration and good standing with the Compensation Commissioner in terms of the Act and submit such with his tender.
 - ii. The Provisional Ordinances and Local Authority, by-laws and all relevant regulations framed there under.
 - iii. The *Consultant* and his employees, where necessary, shall have valid annual safety inductions when accessing or working on site. Copies of which shall be



submitted to the *Employer's Agent*. This will be at a time and location arranged by the *Employer*.

- h) The Consultant must allow for this in his pricing.
- i) All personnel working on site must have attended the Health and Safety induction course and be in possession of a permit to access the various sites.
- j) All health and safety matters associated with the services will be dealt with in accordance with Project Site Specific Health and Safety specifications.
- k) A copy of the Contractor compliance file checklist is attached under Annexure D for reference.

12.2 Site Access and Security Requirements

- a) The TPL sites are classified as National Key Points in terms of the National Key Point Act of 1980 (as amended). All requirements (such as security clearance for all workers) must be adhered to.
- b) All *Consultant's* visitors to site for an extended period are to undergo a security clearance by State Security Agency (SSA).
- c) All *Consultant's* visitors to site are to produce valid identity documents before they can be allowed access to site.
- d) The *Employer* is responsible for facilitating the security clearance process; the following information is required:
 - e) Company Profile
 - f) Certified copies of Identity Documents (ID) copies of all employees who will be working on site.
 - g) The *Consultant* to note that the security clearance process will take approximately one (1) to two (2) months from the date of submission by the *Employer* to the SSA.
 - h) The *Consultant* is therefore required to submit to the *Employer* the required documents at least two (2) months before the date of submission by the Employer to the SSA.
 - i) In addition, the TPL TFIT site is situated within the Cutler Complex and access into and out of the complex needs to adhere to the requirements of the Cutler Management Board.
 - j) In addition, quayside access shall be carried out in accordance with TNPA's access requirements.

12.3 Environmental Requirements

From the environmental perspective, the consultant is to provide environmental screening and baseline studies for the TFIT project. The general objective of the consultancy is to ensure compliance with national environmental legislation (e.g., NEMA), as well as with the Project Standards. The Consultant shall identify and describe the pertinent regulations and standards - both local and international, governing the environmental quality, protection of sensitive areas, land use control at the national and local levels and ecological and socioeconomic issues. The appointed consultant will undertake a status quo assessment of the biophysical and social attributes that may be impacted by the proposed development, the baseline studies consist of the following deliverables:



- a) Screening and fatal flaw analysis,
- b) Biodiversity and ecological assessment,
- c) Biodiversity off-set plan (if necessary),
- d) Climate change impacts, and
- e) Social impact analysis.

The consultant is required to demonstrate their experience in facilitating the Environmental Impact Assessments and Environmental studies on the projects of similar nature. The experience and competencies will be evaluated for scoring purposes. The consultant environmental personnel should have a minimum of an honours degree in environmental management/Science and a valid registration with the Environmental Assessment Practitioner's Association of South Africa (EAPASA) specifically for Environmental Assessment Practitioners; and the South African Council for Natural Scientific Professions (SACNASP). A qualification in LLB will be the added advantage.

- a) The appointed consulting firm will be required to undertake the following:
- b) Undertake a review of the Project Scope, engineering designs and other relevant project documents.
- c) Identify and verify the triggered activities within Listing Notice 1,2, and 3 of the 2017 EIA Regulations GN. 326 of the NEMA, Act 107 of 1998 as amended and any applicable legislation.
- d) Identify the application process required, either a Basic Assessment (BA) or Scoping, Environmental Impact Assessment (S&EIR) process as outlined in the Environmental Impact Assessment (EIA) Regulations GN R326 of 2017, of the NEMA as amended. This screening should also be undertaken in consultation with the applicable Municipal bylaws.
- e) The review and confirmation of the Water-Use Licence triggers and WULA requirements,
- f) The review and confirmation of the Air Emission Licence triggers;
- g) eThekweni municipality permitting requirements.
- h) Identify, and include in the screening report, all other environmental approvals applicable to the proposed project.
- i) The deliverables include, but are not limited to:
 - i. The environmental screening report.
 - ii. The environmental and Social Governance Management Report in line with the sustainability Development Design objectives, Equator principles and Environmental and Social Governance objectives. Reference to be made to the Environmental PLP Guidelines.

12.4 Quality Management

12.4.1 Quality Assurance Requirements

- a) The Consultant executes the services in accordance with the "Quality Assurance and Quality Control Requirements".



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- b) The Consultant submits his quality assurance proposal(s) for the contract. This proposal shall detail the Consultant's quality management system as it applies to all aspects of supply or service provision including design, procurement, manufacturing, installation/erection and commissioning where applicable.
- c) The Consultant develops and maintains a comprehensive register of documents that will be generated throughout the Contract including all quality related documents as part of its Quality Plan.
- d) The Project Quality Plan (PQP) is the Consultant's statement which outlines strategy, methodology, resources allocation, and Quality Assurance and Quality Control co-ordination activities to ensure that the services meet the standards stated in the service information, with a Continuous Improvement Plan. The Project Quality Plan is generally in narrative form detailing the Project Specific QA and QC systems and controls required for the Consultant to complete the specific services.

12.5 Programming

- a) The Consultant's programme shall correspond with the *Employer's* objectives as stipulated in the relevant sections of the *Employer's* Services inclusive of all sheets listed in the Annexures and shall be in line with the overall scope of services, specifications and any other documentation as annexed to this contract.
- b) The Consultant's programme shall comply with the stipulations of the relevant sections of the *Employer's* services, which details the minimum health & safety constraints as imposed on the provision of the services.
- c) The Consultant includes any reasonable foreseen and unforeseen constraints, assumptions and conditions which may arise in line with the overall scope as outlined and the *Employer's* Services.
- d) The Consultant uses Primavera 6 or MS Project 2016 for his programme submissions. In the event that the Consultant will be using earlier or later/more recent versions of the software, the onus is on the Consultant to ensure that a conversion is done in order for the XER/XML file (soft) copy submissions to be compatible with Primavera 6 version 8.2 or MS Project version 2016. Further hereto the *Employer* is indemnified against any loss or corruption of data as a result of a conversion having to be undertaken by the *Employer* on the Consultant's behalf.
- e) The Consultant's first programme submitted for acceptance shall be developed and decomposed such that it is an accurate and robust forecast of the services to be undertaken. This shall be undertaken during the pre-contract negotiation period which is stipulated under Contract Data Part One (2 weeks after the Contract Date).
- f) The Consultant shall take due cognisance of the period for reply as stated in the Contract Data.
- g) The Consultant complies with the *Employer's* Contract Data dates when he submits his first programme for acceptance and all other subsequent programme submissions.
- h) The Consultant shows on his programme submitted for acceptance and/or accepted programme and all subsequently revised programmes or programme submissions showing the critical path or paths and all necessary logic diagrams demonstrating the sequence.



- i) The Consultant's programme shows duration of operations in working days as per the stipulated definition of the workdays and hours as in the *Employer's Services*
- j) Each programme submitted by the Consultant to the *Employer's Agent*, is fully Resource Loaded and Cost Loaded.
- k) The Consultant's programme shows the following levels:
 - i. Level 1 Master Schedule – defines the major operations and interfaces between engineering design, procurement, fabrication and assembly of Plant and Materials, transportation, construction, testing and pre-commissioning, commissioning and Completion.
 - ii. Level 2 Project Schedule – summary schedules 'rolled up' from Level 3 Project Schedule described below.
 - iii. Level 3 Project Schedule – detailed schedules generated to demonstrate all operations identified in the programme from the starting date to Completion.
 - iv. Level 4 Project Schedule – detailed discipline/speciality level schedule decomposed to appropriate levels of detail in order to accurately substantiate activity scope and activity duration estimates; developed and maintained by the Consultant relating to all operations identified on the programme representing the daily activities by each discipline, with activities and operations adequately decomposed in order to accurately represent the effort required to execute said activity/operation and support accurate duration estimates.

12.5.1 Reporting and Monitoring

- a) The Consultant attends meetings as included but not limited to the Employer's service information.
- b) The Consultant attends fortnightly planning / progress meetings (or appropriate alternative intervals as approved by the *Employer's Agent*). The meeting agenda is to include (but not limited to) progress reporting, as detailed under recovery/optimisation, contractual matters in line with the contract.

12.6 Consultant's Management, Supervision and Key People

- a) The Consultant shall provide an organogram showing his key people and their lines of authority and communication.

12.7 Management Structures

- a) The Contract Data shall indicate who the Employer's Agent is. The Employer's Agent is fully empowered to act on behalf of the Employer for the services and scope covered as per the Contract.
- b) The Consultant shall appoint suitably qualified sub-consultant(s) / service providers to carry out any investigative and assessment services on construction and shall act as the Principal Agent for the sub-contracted services in terms of the Construction Regulations.

12.8 Ownership of Data, Designs and Documents

- a) The Parties shall agree that copyright in the data, design and documents shall, after payments by the *Employer* for the services to the Consultant, lie with the *Employer*, subject to the *Employer's* indemnification against any claim from any party, which may arise as a result of the *Employer's* use of such a document, due to the Consultant's infringement of copyright.

12.9 Facilities and Equipment to be Provided by the Employer

- a) No facilities or equipment are provided by the *Employer* during the study. The Consultant may, however, plan with the *Employer's Agent* or others to make use of meeting room facilities and other resources.



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13 ANNEXURES

13.1 Annexure A: DRAWINGS, DOCUMENTS AND REPORTS

ITEM NO.	DOCUMENT DESCRIPTION	DOCUMENT TYPE	DOCUMENT NUMBER / TITLE
A1. NATCOS Site 2 Drawings and Documents			
1.	NATCOS Site 2 General Arrangement	Dwg.	17506-D01 RevB
2.	Site 1 Pump Bay & Surge Valve MFD Sht1 Rev3A	Dwg	DRG 41-62-01
3.	Tank F41104 & F41103 & F41102 & MFD Sht1 Rev3A	Dwg	DRG 41-62-04
4.	Tank 102 & 103 Tank drg Orientation and Marking Plan	Dwg	A-7-2971 35
5.	Tank 102 & 103 Tank drg - xxx	Dwg	A-8-2294
6.	Discharge Pump Curve	Dwg	C4-4985
7.	Fynnland Site 2 & Clairwood – Crude – Into COP	Dwg	Various
8.	Typical Tank Restoration Scope of work	Report	N/A
9.	Tank Assessment Report - Above Ground Vertical Tank F41102	Report	HP/TNET-NATCOS/22-001
10.	Tank Assessment Report - Above Ground Vertical Tank F41103 Rev.01	Report	HP/TNET-NATCOS/22-002
11.	Tank Assessment Report - Above Ground Vertical Tank F41104_Revised	Report	HP/TNET-NATCOS/22-003
A2. TFIT Project Documents and Reports			
1.	Long Term Planning Framework – Body of Knowledge	Report	Extract LTPF 2021 Liquid Fuels BOK Final Report Rev 3.0



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ITEM NO.	DOCUMENT DESCRIPTION	DOCUMENT TYPE	DOCUMENT NUMBER / TITLE
2.	Liquid Fuels value chain optimisation	Report	Extract LFVC_Report Rev 1 DRAFT Rev 2.0
3.	Owners Requirement Specification	Report	TFIT ORS_Signed September 2020
4.	Project Initiation Request Evaluation	Presentation	TFIT Project Evaluation
5.	Project Evaluation Presentation	Presentation	NATCOS - Portions 108 and 109 at Fynnland-(Natcos site 2) Rev 5 20180808
6.	TFIT Concept Flow Diagram - Model	Dwg.	PL 121653
A3. Transnet Joint Investment Project Documents and Reports			
1.	Joint Investment and External Partner Selection Framework (JIEPS)	Report	Transnet Framework for Joint Investment and External Partner Selection.



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13.2 Annexure B: PREFEASIBILITY PHASE GATE REVIEW REQUIREMENTS

ITEM NO.	SECTION	REQUIREMENT
B1. EXECUTION PLANNING		
1.	Owners Requirement Specification (ORS)	Prepared and Signed off by Project Owner
2.	Project Set up	Preliminary
3.	Scope of Facilities	Approved detailed description of each facility area, utility plant, service, infrastructure and support facility
4.	Owner Interfaces	Decided
5.	Contracting Strategies	Preliminary including evaluation of EPC vs EPCm for feasibility and execution phase.
6.	Quality Plan	Preliminary
7.	Organisational Plan	Organisation chart; Roles and responsibilities documented; Resource Plan for following phase.
8.	H&S Management Plan	Preliminary Plan covering major identified hazards
9.	Environmental and Social Work Plan	Draft Plan Prepared
10.	Compliance with Statutory Requirements	Major compliance issues allowed for in cost estimates.
11.	Engineering Plan	Draft approved
12.	Procurement and Contracting Plan	Preliminary
13.	Labour Studies	Preliminary
14.	Logistics Studies	Preliminary



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ITEM NO.	SECTION	REQUIREMENT
15.	Construction Management Plan	Preliminary
16.	Cost and Schedule Management Plan	Preliminary
17.	Lessons Learnt from Previous Projects	Reviewed
B2. HEALTH AND SAFETY		
1.	H&S Leadership Commitment	TPL Approved SHEQ Policy, SFF Approved SHEQ Policy, Draft H&S Organogram for the project.
2.	Design for H&S	Design Health and safety management plan and Baseline HIRA, Human factors health and safety management plan draft. Benchmarking H&S practices relevant to the overall constraints and major hazards identified for the different options
3.	H&S Management Systems	Project H&S Management Plan including, H&S Inputs on design, Legal framework / register, Communications and Risk management.
4.	H&S Risk Management	Preliminary Baseline Risk Assessment (BRA),
5.	H&S Budget Provisions	Approved H&S Budget
6.	Hazardous Area Classification	Preliminary HAC, including process and equipment study for classification of all lines on P&ID. Initial zoning shown on model / drawings on an area by area basis.
B3. ENVIRONMENTAL AND SOCIAL GOVERNANCE		



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ITEM NO.	SECTION	REQUIREMENT
1.	Baseline Data Collection	Definition of baseline data required for (ESA) and environmental design criteria. Identification of monitoring requirements as part of specialist investigations in the (ESA) process.
2.	Environmental Design Criteria	Initial list of environmental design requirements and criteria.
3.	Environmental Authorizations (EA)	Update/confirm fatal flaws analysis of all options. Development of an activity / aspects / impacts register or an Environmental Risk Assessment (ERA), as well as ensure inclusion of environmental risks into the Project Risk Register. Define the environmental authorization process required.
4.	Environmental Management Plan	Environmental Management Plans in draft form
5.	Permitting	Identification of permitting requirements
6.	Social Risks	Stakeholder Engagement Plan
7.	Screening and Project Sustainability	Preliminary Options Analysis comparing cost and social / environmental impacts. Ensure environmental screening and sustainability analysis incorporated into project preferred option. Comparative project ecological footprint of all options.
B4. PROCESS ENGINEERING		
1.	Process Design Basis	Final draft - Feed defined based on representative samples, feed variability defined, Owner process requirements defined, products defined, battery limits defined.



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ITEM NO.	SECTION	REQUIREMENT
2.	Facility Capacity Analysis	Final draft - Based on an analysis of facility data from similar operations.
3.	Process Design Criteria	Final Draft
4.	Block Flow Diagrams	Frozen - Primary process steps and utility plants shown for all options. Recommended flowsheet option identified.
5.	Process Flow Diagrams	Final draft - All significant equipment and streams shown. All utility plants and services defined including main equipment, battery limits. Technology selection complete.
6.	Piping and Instrumentation Diagram	Draft - Initial specification and sizing of major lines, major manual valves, instruments and control valves shown, some minor lines shown.
7.	Process Equipment Calculations	Draft
8.	Process Line List	Draft
9.	Process Description	Frozen - Primary process steps and utility plants described in detail including reasons for selection over alternatives.
B5. LAYOUT		
1.	Facility Locations / Site Selection	Approved and frozen location for facility, utilities and infrastructure.
2.	Site Plot Plan	All primary plant and facility footprints based on approved Area layouts. Service and access corridors approved.
3.	Layout Design Criteria	Include critical equipment list that [potentially] has significant impact on spacing or plant access. Local codes and standards to be included and issued at start of Prefeasibility Phase



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ITEM NO.	SECTION	REQUIREMENT
4.	Facility Layout	Undertake a variety of options and define preferred option depicting all major equipment and centreline distances.
5.	Facility / Area General Arrangements	Layout is further refined. Equipment for major or critical process streams shown and are preliminary in size and location. Sufficient information included to define main floors, egress, accessibility, crane locations and major piping / ducting / cable runs. Issued for approval. Options are still considered.
B6. CIVIL ENGINEERING		
1.	Property Impacts	Extent of impacts defined to enable consultation to commence.
2.	Geotechnical Data	Indicative Site Geotechnical Data. Geotechnical Report based on site-wide (Lot 108&109) initial borehole drilling and surface test pits. Initial lab tests completed. The minimum drilling and testing for the phase is to be conducted to avoid unnecessary spend.
3.	Civil Design Criteria	Draft
4.	Site Conditions	Site-specific topographical data with levels $\pm$ 1 m. Site-specific climatic data
5.	Digital Terrain Model	Topographical data imported from detailed survey.
6.	Hydrology (Flooding) (stipulate reliable sources) i.e. National Roads Standard	Preliminary - Sufficient to illustrate specific site layout and flooding concepts. Flooding philosophy captured in design criteria.
7.	Bulk Earthworks / Drainage Design (stormwater drainage report template + calculations)	Preliminary - Sufficient to illustrate specific site layout and drainage concepts.



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ITEM NO.	SECTION	REQUIREMENT
8.	Material Take-offs / Bills of Quantities (What materials needed; quantities)	Estimated from facility layout using indicative sizes and dimensions.
B7. STRUCTURES (STRUCTURAL ENGINEERING)		
1.	Foundation Concepts	Preliminary - Facility general arrangement final. Civil concepts confirmed in principle. Drainage concepts confirmed in principle. Indicative loads used to eliminate some founding options, with better definition of founding depths and size of footings.
2.	Structural Concepts	Preliminary- Based on finalised general arrangement. Shown in models to provide support to equipment.
3.	Standard Specifications and Drawings	Preliminary
4.	Structural Design Criteria	Preliminary
5.	Corrosion Protection	Preliminary - Indicative methods and technology concepts shown, sufficient to establish philosophy.
6.	Structural Design	Preliminary analysis undertaken using indicative loads to define primary member sizes.
7.	Structural Modelling	Preliminary - Indicative sizes and structural concepts shown, sufficient to establish final facility layout.
8.	Materials Take-offs (MTOs / BOQs) / Bills of Quantities	Estimated from facility layout using preliminary sizes and dimensions. Allowance for tertiary steelwork and details factored.
B8. MECHANICAL ENGINEERING		
1.	Mechanical Design Criteria/ (Design basis)	Preliminary



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ITEM NO.	SECTION	REQUIREMENT
2.	Mechanical Deliverables List	Preliminary
3.	Mechanical Equipment List	Preliminary - Major and minor equipment identified as per PFDs and other available data.
4.	Mechanical Equipment Calculations (Critical / Long Lead Equipment)	Preliminary - Based on available process data for preliminary sizing of major and minor equipment items as required for cost estimate.
5.	Equipment Data Sheets (Critical / Long Lead Equipment)	Preliminary datasheets issued.
6.	Equipment Specifications (Critical / Long Lead Equipment)	Preliminary major equipment specifications issued for budget quotations.
7.	Material Take-Off's (Critical / Long Lead Equipment)	Preliminary lengths, surfaces, volumes or weights based on facility / area general arrangements. Issue for estimate.
8.	Mechanical Model	All equipment on Equipment List modelled. Status of equipment is "modelled and located" with preliminary data.
9.	Mechanical Demolition Drawings	Preliminary Demolition Drawings issued for use.
10.	Mechanical Tie-in List	Preliminary list issued for use.
B9. PIPING / PIPELINES		
1.	Piping and Instrumentation Diagrams (P&IDs ' Process Flow Diagrams (PFDs))	System set-up. PFD Development. P&IDs - Major lines / equipment identified by Process (no intelligence P&IDs).
2.	Design Criteria	Preliminary – use TPL discipline standard
3.	Piping Specifications / Data Sheets	Preliminary – use TPL discipline standard
4.	Piping Materials Classes	Preliminary – use TPL discipline standard
5.	Piping Standard Details	Preliminary – use TPL discipline standard



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ITEM NO.	SECTION	REQUIREMENT
6.	Piping Tie-in Schedule	Key tie-in points registered only.
7.	Piping Model	Complete block models to reflect initial facility layout concepts.
8.	Piping Calculations	Major piping and pipeline sizes calculated
9.	Piping Material Take-Offs / Bills of Quantities	Basic MTO / BOQ of Major Valves and Exotic Materials.
B10. ELECTRICAL ENGINEERING		
1.	Electrical Design Criteria	Preliminary
2.	Electrical Equipment List	Preliminary – Major and minor equipment identified as per PFD's and SLD's and included in cost estimate
3.	Equipment Data Sheets (Critical / Long Lead Equipment)	Preliminary datasheets issued.
4.	Equipment Specifications (Critical / Long Lead Equipment)	Preliminary major equipment specifications issued for budget quotations.
5.	Electrical Calculations and Studies (Load flow, fault level, etc.)	Preliminary - Based on available process data for preliminary sizing of major and minor equipment items as required for cost estimate.
6.	Single Line Diagrams	Preliminary - Include sources of supply, generation and main equipment required for HV and LV distribution.
7.	Connected Load List including Motor List	Main and minor loads identified. Consider growth allowance.
8.	Schematic Diagrams	Schematic diagrams prepared for main HV and LV motor and drive types (final draft).
9.	Electrical Race Way and Cable Tray (Ladder)	General cable tray route and sizes.
10.	Underground	Main underground system routes.



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ITEM NO.	SECTION	REQUIREMENT
11.	Electrical 3D Model and layouts	Preliminary - Switchrooms, substations, control rooms, Electrical Equipment Rooms, main cable routes and major / minor equipment located. Volumes reserved based on preliminary information with consideration of growth.
B11. PORT AND MARINE		
1.	Digital Terrain Model	Preliminary site data - Topographical data imported from general area survey.
2.	Design Vessel Criteria	Draft - Industry analysis to confirm Design Vessel size range. Input into Terminal Logistics, Channel and Port Layout. Cargo parcel sizes and dwell times estimated.
3.	Port Layout Design Criteria	Basic desktop assessment.
4.	Terminal Layout and Logistics Modelling	Basic desktop assessment for cargo throughputs, equipment usage, GA schematics etc.
5.	Wharves, Jetties and other marine infrastructure	Preliminary - Wharf and Port infrastructure options and layouts issued for review and comments. Basis of Design Report completed. Berthing options considered for various vessel sizes. Deck loadings identified.
6.	MTO's and BOQ's	Preliminary - Estimated from port and infrastructure layout using indicative quantities
B12. METERING CONTROL AND INSTRUMENTATION (SPC)		
1.	Facility Control Philosophy	Detailed document on the level of automation, operation and control principles.
2.	Facility Functional Description	Preliminary - Defines the process, operation and control.
3.	Facility Controls Specification	Preliminary specification based on the preliminary I/O count. Provides budget price for the facility control system.



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ITEM NO.	SECTION	REQUIREMENT
4.	Controls System Architecture	Detailed - Sufficiently detailed to obtain budget quotes from control system suppliers.
5.	Instrument Specifications	Preliminary specification for the long lead or exotic instruments, suitable for budget pricing.
6.	Cable Schedule	Preliminary cable schedule with sufficient details for preliminary MTO / BOQ for estimation.
7.	Instrument List	Preliminary instrument list derived from the preliminary P&IDs.
8.	Instrument Data Sheets	Preliminary
9.	Control Valve List	Preliminary valve list based on preliminary P&IDs.
B13. RISK MANAGEMENT		
1.	Risk and Opportunity Management Plan	Preliminary Risk Management Plan.
2.	Risk and Opportunity Management Register	Review and Update of the Risk Management Register, Risk Treatment Plans and Risk Response Actions, Risk Monitoring, Review and Reporting.
3.	Risk Management Report	Preliminary Risk Management Report
4.	Cost Risk Analysis	Perform Multi-Criteria Decision Analysis (MCDA) to determine the best option. Gather information needed: - Budget (Cost Estimate by Resource and Activity Table) - Cost of Delay



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ITEM NO.	SECTION	REQUIREMENT
5.	Schedule Risk Analysis	Perform Multi-Criteria Decision Analysis (MCDA) to determine the best option. Gather information needed - Logical Project Schedule (with Critical Path and allocated Resources and Activity Budget)
B14. SCHEDULE		
1.	Project Master Schedule	Detailed Level 3 Schedule, Clearly marked out schedule critical path.
2.	Engineering Schedule	Detailed Level 3 Schedule, All key activities and interdependences (including critical vendor data) identified and incorporated into schedule.
3.	Procurement Schedule	Procurement cycle of all key packages included (possibly at a summary level). Other activities included at a summary level. Key dependencies identified.
4.	Construction Schedule	Detailed Level 2 Schedule, All key areas planned including summary resources and indirects. Durations based on Feasibility phase estimated hours.
5.	Commissioning and Start Up Schedule	Preliminary,
6.	Tie in Schedule	Preliminary,
7.	Quantitative Risk Profiling	Full schedule range analysis based on risk register and project risk workshop.
8.	Schedule Basis Description	Lists all assumptions and describes critical assumptions. Lists key risks and opportunities and how they are identified in the schedule.
B15. COST ESTIMATE		



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ITEM NO.	SECTION	REQUIREMENT
1.	Capital Cost Estimate	Level 2 Cost Estimate, Estimate based on preliminary bid for major equipment, C/S/A rough estimate, electrical and controls factored based on mechanical cost. Estimate by 2nd level of FBS. Indirect, Freight and Construction Equipment costs included in estimate. Escalation, Contingency, Risk and Forex included in estimate.
2.	Operating Cost Estimate	Level 2 Estimate
3.	Estimate Plan	Generic
4.	Estimate basis	Preliminary
5.	Labour rate	Preliminary - Included in Capital Cost Estimate.
6.	Productivity	Preliminary - Included in Capital Cost Estimate.
7.	EPCM	Preliminary man-hour evaluation using Market Rates.
8.	Owners Cost	Preliminary – Percentage of Direct Cost
9.	Supplier development and other social requirements costs	CSDG costs
B16. PROCUREMENT		
1.	Demand Planning and Management	Preliminary Demand Planning Report
2.	Sourcing	Preliminary Sourcing Strategy.



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ITEM NO.	SECTION	REQUIREMENT
3.	Supplier and Enterprise development	Preliminary ESD Strategy, Contractor Performance monitoring and reporting.
4.	Inventory and Logistics	Preliminary Delivery Schedule
5.	Disposal	Preliminary Report on disposal of assets / materials/ consumables.
6.	Contract Management	Preliminary - Determine appropriate Transnet Contract and conditions. Provide review and check of any potential misalignments, risks or opportunities in the proposed contracting strategy. List available options and rationale of options.
7.	Procurement Management Plan	Preliminary Procurement Management Plan.
B17. QUALITY		
1.	Project Objectives	Defined
2.	Quality Execution / Management Plan	Preliminary Quality Execution / Management Plan,
3.	Quality Management Systems and Procedures	Finalise for project phase
4.	Quality Manplan and Resourcing	Preliminary
5.	Project QA/QC Function Performance	Finalised for phase
6.	Quality Budget	See Cost Section for Quality Man hours and Resources
B18. OPERATIONAL READINESS		
1.	OR Business Requirements	Defined by Owner by phase end,



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ITEM NO.	SECTION	REQUIREMENT
		Project OR Requirements validated and finalised by Project Owner and includes, key design criteria, operational support requirements, ramp-up and production build-up requirements, Operating cycle, OR risks.
2.	OR Human Resources Plan	Finalisation of the HR and staffing Requirements for facility including, Recruitment Plan, Training Plan, Retention Plan, Key Succession Plan, HR business processes.
3.	OR Design Influences (Design Effectiveness)	Defined by phase end. System objectives and functionality defined, Operational Support system, System capacities, utilisation and redundancies.
4.	OR Operational Preparedness	Defined by phase end. Business Readiness such as: - HR, - Financial, - Admin & Business, - IT - Operational Support, - Production plans.
5.	OR Executive Planning	Develop and Cost (Level 2) by phase end
6.	OR Assurance	Defined by phase end. OR Accountabilities & Responsibilities, OR KPA's or KPI's.
B19. OWNERS REQUIREMENT SPECIFICATION (ORS)		



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ITEM NO.	SECTION	REQUIREMENT
1.		This deliverable is to be provided by the <i>Employer's</i> management team and approved by the <i>Employer's</i> leadership. Information will be requested for the completion of the ORS from the <i>Consultant</i> as required.
B20. BUSINESS CASE AND FINANCIAL MODEL		
1.		The business case and financial model deliverable includes the overview of the various PLP domains and summarising the pertinent aspects for inclusion into the project business case. This deliverable is the responsibility of the <i>Employer's</i> Project Management Team. The <i>Consultant</i> is to provide support to the <i>Employer's</i> Project Management Team as required.
B21. FACILITIES		
1.	Structural Integrity	Preliminary
2.	Maintenance Requirements Management	Preliminary
3.	Equipment (e.g. UPS, Standby generators, Lightning protection) and Networking	Preliminary
4.	HVAC Systems	Preliminary
5.	General Lighting	Preliminary



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13.3 Annexure C: TRANSNET TEMPLATES

ITEM NO.	PLP DOMAIN	DOCUMENT TITLE
C1. TRANSNET GATE REVIEW TEMPLATES		
1.	Execution Plan	Project Execution Plan (PLP) Template
2.	Health and Safety	Health and Safety Management Plan (PLP) Template
3.	Environment & Community	Environmental and Social Management Plan Template
4.	Environment & Community	Stakeholder Management Plan (PLP) Template
5.	Risk Management	Risk Management Plan (PLP) Template
6.	Risk Management	Risk Opportunity Register (PLP) Template
7.	Schedule	Schedule Management Plan (PLP) template
8.	Cost	Basis of Estimate Report (PLP) Template
9.	Cost	Cost Management Plan (PLP) Template
10.	Procurement	Procurement and Contracts Execution Plan Template
11.	Construction Management	Construction Management Plan (PLP) Template
12.	Commissioning	Commissioning Management Plan (PLP) Template
13.	Quality	Quality Management Plan (PLP) Template
14.	Operational Readiness	Operational Readiness Plan (PLP) Template
C2. OTHER PROJECT TEMPLATES		
1.	Project Charter	Project Charter Template

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13.4 Annexure D: DESIGN CODES AND STANDARDS

ASME - American Society of Mechanical Engineers

ASME B16.47	Series A – Large Diameter Steel Flanges NPS 26 through NPS 60
ASME B16.5	Pipe Flanges and Flanged Fittings NPS ½ through NPS 24, 1996
ASME B31.3	Process Piping Guide
ASME B31.4	Pipeline Transportation Systems for Liquid Hydrocarbon and Other Liquids
ASME Section V	Non-destructive examination
ASME Section IX	Welding and Brazing Qualifications
ASME B16.9	Factory Made Wrought Butt-weld fittings
ASME B16.20	Metallic gaskets for pipe flanges
ASME B16.34	Valves – Flanged, threaded and welding end
ASME B36.10	Welded & Seamless wrought steel pipe
ASME B 1.1	Unified Inch Screw Threads
ASME VIII, Div 1	Boiler and Pressure Vessel Code

ASTM - American Standards Testing of Materials

ASTM A370	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM A194/A194M	Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
ASTM E 23	Standard Test Methods for Notched Bar Impact Testing of Metallic Materials
ASTM E164	Standard Practise for Ultrasonic Contract Examination of Weldments
ASTM E165	Standard Test Method for Liquid Penetrant Examination
ASTM E384	Standard Test Method for Micro-indentation Hardness of Materials
ASTM E709	Standard Guide for Magnetic Particle Examination
ASTM 694	Carbon and Alloy Steel Forgings for Pipe Flanges, Fittings, Valves and Parts for High Pressure Transmission Service



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API – American Petroleum Institute

API 500	Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2
API 650	Welded Steel Tanks for Oil Storage
API 651	Cathodic Protection of Aboveground Petroleum Storage Tanks
API 653	Tank Inspections, Repair, Alteration, and Reconstruction
API 1549	Design, Construction, Operation and Maintenance of Aviation Fuelling Facilities
API 1104	Welding of Pipelines and Related Facilities
API-RP1110	Recommended Practice for Hydrostatic Testing of Steel Pipelines
API 2550	Measurement and Calibration of Upright Cylindrical Tanks
API 2000	Venting Atmospheric and Low-Pressure Storage Tanks
API-RP2003	Procedures for Welding or Hot Tapping
API 2610	Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities
API 610	Centrifugal pumps for Petroleum, Petrochemical and Natural Gas Industries
API 682	Shafts Sealing for Centrifugal and Rotary Pumps
API Q1	Specification for Quality Programs for the Petroleum, Petrochemical and Natural Gas Industry
Bull 6AF	Capabilities of API Flanges under Combinations of Load
RP 5C6	Welding Connections to Pipe

ASNT - American Society for Non-Destructive Testing

ASNT CP 189	Qualifications and Certification of Non-Destructive Testing Personnel
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NACE - National Association of Corrosion Engineers

NACE MR0175	Petroleum and Natural Gas Industries Materials for use in H2S
Containing	Environments



NACE RP 01-69	Control of External Corrosion on Underground or Submerged Metallic Piping Systems
NACE RP 01-77	Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems
NACE RP 01-93	External Cathodic Protection of On-grade Carbon Steel Storage Tank Bottoms
NACE RP 02-00	Steel-Cased Pipeline practices
NACE RP 02-86	Electrical Isolation of Cathodically Protected Pipelines
NACE RP 05-72	Design, Installation, Operation and Maintenance of Impressed Current Deep Groundbeds
NACE RP 01-69	Control of External Corrosion of Underground Metallic Piping System

NFPA - National Fire Protection Association

NFPA 30H	Flammable and Combustible Liquids Code Handbook
NFPA 10	Portable Fire Extinguishers
NFPA 11	Standard Low to Medium Expansion Foam Systems
NFPA 11A	Standard Medium to High Expansion Foam Systems
NFPA 13	Automatic Sprinkler Systems
NFPA 15	Water Spray system for Fire Protection
NFPA 24	Private Fire Service Mains
NFPA 25	Inspection, Testing & Maintenance of Water Base Fire Protection Systems
NFPA 30	Flammable and Combustible liquids code
NFPA 72	Protective Signalling Systems

British Standards

BS 8007: 1987	Code of Practice for Design of Concrete Structures for retaining Aqueous Liquids
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PFI - Pipe Fabrication Institute



PFI-ES-3 Fabricating Tolerances

SANS – South African National Standard

SANS 1019	Standard voltages, currents and insulation levels for electricity supply
SANS 10089-1	The Petroleum Industry Part 1 – Storage and Distribution of Petroleum Products in Above-Ground Bulk Installations
SANS 10089-2	Code of Practice for the Petroleum Industry
SANS 10121	Hot Dip Galvanised Coatings on Fabricated Iron and Steel Articles – Specification and Test Methods
SANS 10160	The General Procedure & Leadings to be adopted in the Design of Buildings
SANS 10160-1	The Structural Use of Steel Part 1
SANS 10108	Classification of Hazardous Locations and Selection of Electrical Apparatus for use in such Locations
SANS 10199	The design and installation of earth electrodes
SANS 10292	Earthing of low-voltage (LV) distribution systems.
SANS 10313	The protection of structures against lightning
SANS 60079 (1-35)	Explosive Atmospheres
SANS ISO 2808	Paint and Varnishes – Determination of Film Thickness
SANS ISO 9002	Quality System – Model for Quality Assurance in Production, Installation and Servicing
SANS 10064	The Preparation of Steel Surfaces for Coating
SANS 10140	Identification and Colour Marking
SANS 10142-1	Wiring of Premises: Part 1 Low Voltage Installations
SANS 1217	Standard Specification for the Production of Painted and Powder Coated Steel Pipes
SANS 1274	Coatings Applied by Powder Coating Process
SANS 5769	Cleanliness of Blast Cleaned Surfaces for Painting
SANS 5772	Profile of Blast Cleaned Surfaces for Painting
SANS 5789	Cleanliness of Blast Cleaned Surfaces for Painting
SANS 1598	Unleaded Petrol (2006 Edition 2)
SANS 342	Automotive Diesel Fuel (2006 Edition 4)
SANS ISO 4427	Buried Fire Water Piping (HDPE)
DIN 8074	Buried Fire Water Piping (HDPE)

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MIL-T-83133D JET (29 January 1992)

SABS 1091 National Colour Standards for Paint

Transnet Pipelines Standards

PL 100	Drawings Standards Document
PL 101	Plant and Equipment Tag Numbering Standards
PL 102	Equipment, Instrument and Electrical Symbolology Standards
PL 103	General Drawing Standards
PL 135	Specification for Single Balanced Mechanical Seals
PL 145A	Specification for Power Factor Correction Modules
PL 401B	Specification for Line Pipe
PL 415E	Specification for Steel Flange Insulating Kit
PL 505	Specification for Horizontally Mounted between bearings Multistage axially split Centrifugal Pumps
PL 610A	Specification for MV Induction Motors
PL 619C	Specification for Three phase Electric Actuators
PL 622H	Specification for Standby Plant
PL 631	Specification for LV Switchgear & Distribution Boards
PL 632	Specification for MV Switchgear
PL 647	Specification for Substation Battery Charger – 110V DC
PL 648	Specification for Substation Battery Charger – 50V DC
PL 666	Specification for Electrical Design Criteria
PL 703	Specification for Telecontrol Communications Network Standard
PL 709	Specification for Metering Standard
PL 711	Specification for Equipment Cabinets to House Electronic Equipment
PL 720	Specification for Uninterruptible Power Supply
PL 723	Specification for Automation Standard
PL 727	Petronet Code of Practice for Cabling, Racking, Trenching & Earthing Installation



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PL 829 Petronet General Specification for the Requirements for a Petroleum Products Quality Control Centre

Petronet Standard Document for Petronet Depot Upgrades Part 1: Buildings

Document Numbering

SYS-P-0001 (a) Transnet Group Strategy & Planning Document Management Standard Document Numbering Codification

EURO Norms

EN 10204 Inspection Documents for Delivery of Metallic Products

NORSOK – Norsk Sokkels Konkuranseposisjon

M501 Surface Preparation and Protective Coating

Civil and Structural Specifications

The latest versions of the following specifications with their latest amendments are applicable to civil and structural design:

SANS 10100-1	The Structural Use of Concrete Part 1: Design
SANS 10100-2	The Structural Use of Concrete Part 2: Materials and Execution of Work
SANS 10144	Detailing of steel reinforcement for concrete
SANS 10160-1	Basis of structural design
SANS 10160-2	Self Weight and imposed loads
SANS 10160-3	Wind Actions
SANS 10160-4	Seismic Actions and general requirements for building
SANS 10161	The Design of Foundations for Buildings
SANS 10162-1	The Structural Use of Steel Part 1: Limit-State Design of Hot Rolled Steel
SANS 10162-2	The Structural Use of Steel Part 2: Limit-State Design of Cold Formed Steelwork

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SANS 10162-4 The Structural Use of Steel Part 4: The Design of Cold-Formed Stainless Steel Structural Members

SANS 10164-1 The Structural Use of Masonry Part 1: Unreinforced Masonry Walling

SANS 10164-2 The Structural Use of Masonry Part 2: Structural Design and Requirements for Reinforced and Pre-stressed Masonry

SANS 10400 The Application of the National Building Regulations

Standardised Construction Specifications

The latest versions of the following specifications with their latest amendments are applicable to civil and structural construction, as prescribed in the Works Information for the construction contracts. Cognisance of these is to be taken in civil and structural design.

SANS 1200-A:1986	General
SANS 2001-BE1:2008	Site Clearance (General)
SANS 2001-BS1:2008	Earthworks (General)
SANS 1200-D:1988	Earthworks
SANS 2001-DP1:2008	Earthworks for Buried Pipelines and Prefabricated Culverts
SANS 1200-DE:1984	Small Earth Dams
SANS 1200-DK:1996	Gabions and Pitching
SANS 1200-DM:1981	Earthworks (Roads, Subgrade)
SANS 1200-F:1983	Piling
SANS 2001-CC1	Concrete Works (Structural)
SANS 2001-CS1	Construction Works; Part CS1: Structural Steelwork
SANS 1921-3	Construction and Management Requirements for Works Contracts; Part 3: Structural Steelwork
SANS 1200-HA:1990	Structural Steelwork (Sundry Items)
SANS 1200-HB:1985	Cladding and Sheeting
SANS 1200-HC:1988	Corrosion Protection of Structural Steelwork
SANS 2001-CM1:2007	Masonry Walling
SANS 2001-CT2:2007	Structural Timberwork (Roofing)
SANS 1200-L:1983	Medium Pressure Pipelines
SANS 1200-LC:1981	Cable Ducts
SANS 1200-LD:1982	Sewers
SANS 1200-LE:1982	Stormwater Drainage
SANS 1200-LG:1983	Pipe Jacking
SANS 1200-M:1996	Roads (General)
SANS 1200-ME:1981	Subbase



SANS 1200-MF:1981	Base
SANS 1200-MFL:1996	Base (Light Pavement Structures)
SANS 1200-MG:1996	Bituminous Surface Treatment
SANS 1200-MH:1996	Asphalt Base and Surfacing
SANS 1200-MJ:1984	Segmented Paving
SANS 1200-MK:1983	Kerbing and Channelling
SANS 1200-MM:1984	Ancillary Road works

Industry Norm Design Specifications

Where the Standardised and Prescribed Design Specifications and project-specific information do not adequately specify design requirements, reference will be made to industry norms for industrial plants.

Health and Safety Specifications

TIMS Policy Commitment Statement

Contractor Health and Safety Specification Guideline (TRN-IMS-GRP-GDL-014.3)

Transnet Contractor Management Procedure (TIMS-GRP-PROC-014)

Contractor Compliance File Assessment Checklist (TRN-IMS-GRP-TMP -014.11)

Marine Standards

ISGOTT Latest Edition

OCIMF Inspection Guidelines



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13.5 Annexure E: PRODUCT SPECIFICATIONS

Refined Product				
Ultra-low Sulphur Diesel				
1.0	Product Specification	Units	Value	Reference
	S	ppm wt	≤50	ASTM D2622 / D5453
	H ₂ O	% vol	<0.05	ASTM D95 / D4377
	Bio-Diesel	% vol	≤ 5	
	Ash content	% wt	≤ 0.01	ASTM D482
	Total contamination	ppm wt	≤ 24	Note 1
	Colour			
	Viscosity (40°C - 10°C)	mm ² /s	2.89 – 5.91 Note 2	ASTM D445
	Density @ 20°C	kg/m ₃	817.5 Note 2	ASTM D4052
	Design density	kg/m ₃	858 Note 2	
	Lubricity @ 60°C		<460	ISO 12156-1
	Flash Point	°C	>55	ASTM D93
	Distillation Temp (90% vol frac)	°C	<362	ASTM D86
	Cetane Number		>45	ASTM D613
	Copper strip corrosion (3h @100°C)		1	ASTM D130
	RVP (Reid Vapour Pressure)	kPa	≤ 0.1 Note 3	ASTM D613
Remarks: Above given figures as per SANS 342: 2006				
Note1: Ex-refinery requirement				
Note2: Taken from FEED Package				
Note 3: As per SAPREF and ENGEN MSDS @ 40°C				



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Refined Product				
Low Sulphur Diesel				
1.0	Product Specification	Units	Value	Reference
	S	ppm wt	500 ± 1	ASTM D2622 / D5453
	H ₂ O	% vol	<0.05	ASTM D95 / D4377
	Bio-Diesel	% vol	≤ 5	
	Ash content	% wt	≤ 0.01	ASTM D482
	Total contamination	ppm wt	≤ 24	Note 1
	Colour			
	Viscosity (40°C - 10°C)	mm ² /s	2.89 – 5.91 Note 2	ASTM D445
	Density @ 20°C	kg/m ³	817.5 Note 2	ASTM D4052
	Design density	kg/m ³	858 Note 2	
	Lubricity @ 60°C		<460	ISO 12156-1
	Flash Point	°C	>55	ASTM D93
	Distillation Temp (90% vol frac)	°C	<362	ASTM D86
	Cetane Number		>45	ASTM D613
	Copper strip corrosion (3h @100°C)		1	ASTM D130
	RVP (Reid Vapour Pressure)	kPa	≤ 0.1 Note 3	ASTM D613
Remarks: Above given figures as per SANS 342: 2006				
Note 1: Ex-refinery requirement				
Note 2: Taken from NMPP FEED Package				
Note 3: As per SAPREF and ENGEN MSDS @ 40°C				



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Refined Product				
93 Unleaded Petrol (metal free)				
1.0	Product Specification	Units	Value	Reference
	RON number		93	ASTM D2699 or IP 4237
	Pb	mg/l	< 13	ASTM D3341
	S	ppm wt	< 500	ASTM D5453
	H ₂ O	% vol		
	Aromatics content	% vol	< 50	ASTM D5443
	Benzene content	% vol	< 5	ASTM D5443
	Colour			
	Viscosity (20°C - 1°C)	mm ² /s	0.622 – 0.724 Note 1	ASTM D445
	Density @ 20°C	kg/m ³	724.3 Note 1	ASTM D1298 / D4052
	Design Density	kg/m ³	724.3 Note 1	
	Flash Point	°C	-20	Sasol MSDS
	Distillation Temp (10% vol frac)	°C	<65	ASTM D86
	Distillation Temp (50% vol frac)	°C	<77 - 115	ASTM D86
	Distillation Temp (90% vol frac)	°C	<185	ASTM D86
	Final boiling point	°C	<215	ASTM D86
	Reid Vapour Pressure	kPa	45 - 75	ASTM 323
	Copper strip corrosion (3h @50°C)		class 1	ASTM D130
Remarks: Above given figures as per SANS 1598: 2006				
Note1: Taken from NMPP FEED Package				

TENDER NUMBER: TPL/2024/08/0003/73198/RFP



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Refined Product				
95 Unleaded Petrol (metal free)				
1.0	Product Specification	Units	Value	Reference
	RON number		95	ASTM D2699 or IP 4237
	Pb	mg/l	< 13	ASTM D3341
	S	ppm wt	< 500	ASTM D5453
	H ₂ O	% vol		
	Aromatics content	% vol	< 50	ASTM D5443
	Benzene content	% vol	< 5	ASTM D5443
	Colour			
	Viscosity (20°C - 1°C)	mm ² /s	0.649 – 0.748 Note1	ASTM D445
	Density @ 20°C	kg/m ³	738.2 Note 1	ASTM D1298 / D4052
	Design Density	kg/m ³	738.2 Note 1	
	Flash Point	°C	-20	Sasol MSDS
	Distillation Temp (10% vol frac)	°C	<65	ASTM D86
	Distillation Temp (50% vol frac)	°C	<77 - 115	ASTM D86
	Distillation Temp (90% vol frac)	°C	<185	ASTM D86
	Final boiling point	°C	<215	ASTM D86
	Reid Vapour Pressure	kPa	45 - 75	ASTM 323
	Copper strip corrosion (3h @50°C)		class 1	ASTM D130
Remarks: Above given figures as per SANS 1598: 2006				
Note1: Taken from NMPP FEED Package				



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Refined Product				
JET				
1.0	Product Specification	Units	Value	Reference
	Total acidity	mg KOH/g	< 0.015	IP 354/ASTM D 3242
	S	% mass	< 0.2	IP336
	H ₂ O	% vol	no free water at ambient	
	Aromatics content	% vol	< 25	IP 156/ASTM D 1319
	Colour		clear, bright, visually free from solids	
	Freezing Point	°C	-47	IP 16/ASTM D 2386
	Viscosity (40 - 10°C)	mm ² /s	1.328 – 2.111 Note1	ASTM D445
	Density @ 20°C	kg/m ³	796 Note1	ASTM D1298 / D4052
	Design Density	kg/m ³	796 Note 1	
	Flash Point	°C	>38	
	Distillation Temp (10% vol frac)	°C	max 205	ASTM D86
	Distillation Temp (50% vol frac)	°C		ASTM D86
	Distillation Temp (90% vol frac)	°C		ASTM D86
	Final boiling point	°C	<300	ASTM D86
	Reid Vapour Pressure	kPa	≤ 0.1 Note 2	ASTM D613
	Copper strip corrosion (3h @50°C)		class 1	ASTM D130
Remarks: Above given figures as MIL-T-83133D: 1992				
Note1: Taken from NMPP FEED Package				
Note 2: As per SAPREF and ENGEN MSDS @ 40°C				



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