PART C3: SERVICE INFORMATION

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C3.1 Service Information

SCOPE OF WORK FOR RISK-BASED CONTAMINATION ASSESSMENT AT TRANSNET PIPELINES FACILITIES (PIPELINE, DEPOTS AND PUMP STATIONS) DURING EMERGENCY FOR A PERIOD OF THREE YEARS FOR KWA-ZULU NATAL PROVINCE

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ABBREVIATIONS

CSM	Conceptual Site Model
DFFE	Department of Forestry, Fisheries and Environment
EMP	Environmental Management Plan
GPS	Global Positioning System
HSE	Health, Safety, and the Environment
SHEQMP	Safety, Health, Environment and Quality Management Plan
KPI	Key Performance Indicator
LNAPL	Light Non-Aqueous Phase Liquids
MCA	Multi Criteria Analysis
NEMA	National Environmental Management Act (No. 107 of 1998)
NEMWA	National Environmental Management Waste Act (No.
NWA	National Water Act (No. 36 of 1998)
OHSA	Occupational Health and Safety Act (No. 85 of 1993)
RAP	Remediation Action Plan
SANAS	South Africa National Association Standards
SURF:UK	United Kingdom's Sustainable Remediation Forum
SWL	Standing Water Level
TPL	Transnet Pipelines

1 OVERVIEW

1.1 Background

Transnet Pipelines (TPL), a division of Transnet Limited, owns, operates and maintains approximately 3,586 km of underground liquid and gas pipelines traversing KwaZulu-Natal, Gauteng, Free State, Mpumalanga and North West Provinces. The pipelines contain various petroleum products such as crude oil, aviation turbine fuel (avtur), petrol, diesel and other partially refined products as well as methane rich gas. Refer to Figure 1 for the pipeline network.

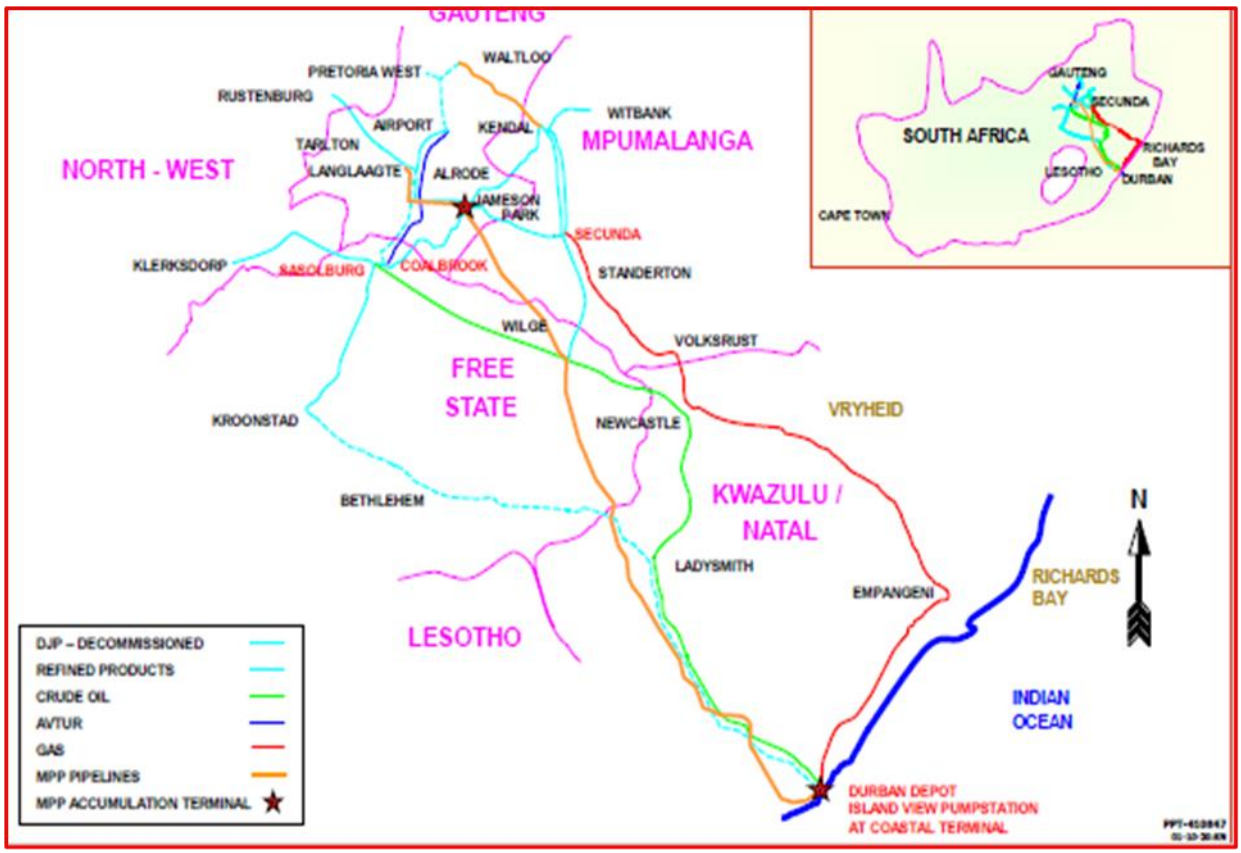

Figure 1: Transnet Pipeline Network

The service provider required for this contract is for emergency situations of sites that are or will be located at TPL pipelines network and depots, pump stations and workshops at Kwa-Zulu Natal Province.

TPL acknowledges its responsibility in terms of the Constitution of the Republic of South Africa (Act 108 of 1996), the National Environmental Management Act (No. 107 of 1998) (NEMA),

the National Environmental Management: Waste Act (No. 59 of 2008) (NEM:WA) and the National Water Act (No. 36 of 1998) (NWA) which, amongst others, enshrine environmental rights for the people of South Africa, and promotes integrated environmental management.
TPL is committed to ensuring that the remediation and rehabilitation of contaminated sites is undertaken in a sustainable and responsible manner and that all significant environmental and human health risks are identified and sufficiently addressed to reduce the risk to an acceptable level.

To this end, Transnet seeks to appoint *Service Provider* with relevant knowledge, competence and experience to provide specialist services for the following:

a) Risk-based site contamination assessment after an emergency incident at any TPL facility and/or along the pipeline route;
b) Independent monitoring of the site/s undergoing remediation to ensure that the work is aligned to the remediation plan.

TPL wish to understand the following:

- Which sites require immediate remediation;
- Which sites do not present an immediate risk but measures are required to address the monitoring and management of the risk;
- What are the most cost effective remedial options;
- The remedial options with respect to cost, time, complexity, space constraints and efficiency of remedial technology;
- The management, remediation and rehabilitation of the sites.

The purpose of this document is to outline the Scope of Work that is required for:

a) The risk-based Site Contamination Assessment after an emergency incident at any TPL facility and/or along the pipeline route.
b) An independent monitoring and audit of the site/s undergoing rehabilitation and remediation.

1.2 Employer's objectives

The *Employer's* objective is to enter into a Term Services Contract (TSC) with a Service Provider to provide Specialist Services across Transnet Pipelines to determine whether spilled fuel product from its operations has the potential to cause significant risk to human health and the environment.

The *Employer's* main objective is to understand the level of risk to human health and the environment, the requirements to reduce the risk to an acceptable level and to ensure that the site can be closed out with the DFFE as well as the cost and time to undertake these mitigation measures. Therefore Transnet Pipelines desires to appoint a *Contractor* who is experienced and competent in the field of:

- Hydrocarbon Site Contamination Assessments and Remediation;
- Independent monitoring of sites undergoing remediation and rehabilitation.

1.3 Purpose

The purpose of this document is to outline the Scope of Services that is required for:

a) The risk-based Site Contamination Assessment after an emergency incident at any TPL facility and/or along the pipeline route.

b) An independent monitoring of site/s undergoing rehabilitation and remediation.

2 DESCRIPTION OF SERVICES

TPL acknowledges its responsibility in terms of environmental legislation of the country, and is committed to ensuring that the remediation and rehabilitation of contaminated sites is undertaken in a sustainable and responsible manner and that all significant environmental and human health risks are identified and sufficiently addressed to reduce the risk to an acceptable level. To this end, TPL seeks to appoint a *Contractor* with relevant knowledge, competence and experience to provide specialist services for the following:

a) A risk-based Site Contamination Assessment after an emergency incident at any TPL facility and/or along the pipeline route;

b) An independent monitoring of sites undergoing remediation and rehabilitation.

TPL wish to understand the following:

- Which sites require immediate remediation;
- Which sites do not present an immediate risk but measures are required to address the monitoring and management of the risk;
- What are the most cost effective remedial options;
- The remedial options with respect to cost, time, complexity, space constraints and efficiency of remedial technology;
- The Remediation and Rehabilitation of the sites.

TPL is experiencing a spate of fuel theft from its pipeline network that in many instances result in environmental contamination and a potential risk to human health and the environment. TPL has appointed a spill response contractor to contain and recover product from the spillages whilst its own technicians undertake repairs to the pipeline to reinstate operations. TPL is responsible to contain, recover, remediate and rehabilitate the impacted areas to as close as is reasonably possible to its original state and/or for future land use. TPL is committed to ensuring that the containment, recovery, remediation and rehabilitation is undertaken sustainably; in a responsible manner; and that all environmental and human health risks are identified and sufficiently managed to avoid and/or minimise the impacts associated with an incident.

TPL believes that good quality Site Contamination Assessments are critical to understanding the degree and extent of the contamination, the risks posed to human health and the

environment and understand the remediation and rehabilitation to be undertaken to restore the impacted site in a cost effective and sustainable manner.

A need therefore exists to undertake risk-based Site Assessments of the contaminated sites to determine whether the site:

(i) presents a risk to human health and/or the environmental and needs to be remediated immediately or within a specified period;

(ii) does not present an immediate risk but measures are required to address the monitoring and management of the risk;

(iii) identify cost effective remedial options; and

(iv) evaluate the remedial options with respect to cost, time, complexity, space constraints and efficiency of remedial technology

2.1 Risk-based Site Contamination Assessments

The focus of this scope is to:

- Undertake a risk-based Assessment of a contaminated site as per the DEA Framework for the Management of Contaminated Land (2010) or other similar internationally recognized Standards and/or Guidelines.
- The Site Assessment Study must be carried out in a phased approach. At the end of each phase a report is to be submitted to the Employer that contains the requirements listed hereunder as well as a Scope of Work and Cost Estimate for the following Phase.
- The study must be undertaken as per Section 37(2)(a) of the NEM:WA to determine whether the site:
    i) presents a risk to human health and/or the environmental and needs to be remediated immediately or within a specified period;
    ii) does not present an immediate risk but measures are required to address the monitoring and management of the risk;
    iii) Identify cost effective remedial options; and
    iv) Evaluate the remedial options with respect to cost, time, complexity, space constraints and efficiency of remedial technology

The appointed *Contractor* shall be required to provide:

- All services necessary to deliver the scope of work as set out below, including but not limited to:
    - Specialist studies and investigations including modelling, mapping and simulations;
    - Preparation of required reports, plans and procedures;
    - Supervision of the construction of monitoring wells and/or piezometers, as applicable;
    - Drilling must be conducted by a credible drilling contractor/personnel;
    - Drilling positions must be strategically determined based on source, plume, background and receptor locations;
    - Survey of all monitoring wells piezometers etc to a local datum to determine the groundwater flow direction;
    - Record the SWL and the thickness of LNAPL, if any, in all boreholes;
    - Conduct a bail test to determine hydraulic conductivity of the saturated zone;
    - Collect water samples from each of the newly drilled boreholes as well as old monitoring boreholes to determine the dissolved phase groundwater concentrations;
    - All samples must be submitted to a SANAS accredited organics laboratory for analyses of Volatile Petroleum Hydrocarbons; and
    - Conduct borehole yield test on an as and when required basis as requested by TPL.
    - Engagement with key stakeholders and relevant authorities;
- Ensure that all relevant legislation is taken into consideration, and that plans and procedures are aligned with these where required.
- The *Contractor* shall be responsible for overall project management to ensure that activities are undertaken within the required timeframes for completion, that services and reports are of good quality and that all deliverables as set out are met.

2.2 Detailed Scope of Services Required for Risk-based Site Contamination Assessments

The *Contractor* shall provide all management and specialist services that may be required to deliver the following:

2.2.1 Phase 1 – Preliminary Site Assessment and Report

A preliminary site investigation will typically take place where the source and the contaminants of concern may be unknown. Where a pipeline leak is identified this step may be consolidated into a Phase 2 Assessment however, the information is important for the notification of the Authorities.

A Preliminary Site Assessment will generally comprise of:

- A Desk Top Study
- Detailed site inspection
- Interviews with neighbours, workers (past and present), managers etc.
- Data evaluation
- Development of an initial Conceptual Site Model
- Identification of initial potential risks, uncertainties and limitations
- Initial containment and recovery recommendations to minimise the migration of the product and the environmental impacts associated with containment activities especially in sensitive areas like wetlands.

A Phase 1 assessment requirements must include but not limited to the following:

- A site description - locality and size
- Local topography, geology, drainage, surface cover, vegetation, ecological processes
- Nature and extent of contamination
- Contaminants of Concern
- Historical activities
- Current activities
- Description of the current conditions of the site and the contents and results of previous assessment reports if any
- Concentrations of contaminants
- Groundwater Hydro-census up to 2km radius from the site - Status of groundwater, yield and depth to water table.

- Proximity of contaminated site to surface water bodies (including the delineation of a Wetland)
- Proximity of contaminated site to drinking water supplies
- Annual rainfall and flood potential
- Land and water use for site and nearby areas
- Current land use and future land use
- Current condition of the site and contents and results of previous assessments
- Stakeholder Engagement
- Any requirement/s as Regulated by the Minister under Section 69 (u) and (v) of the Waste Act (2008)
- A Conceptual Site Model of the site (CSM). The Conceptual Site Model (CSM) must describe the environmental setting, potential areas of concern, associated contaminants, migration pathways, potential receptors and exposure routes. The CSM is an iterative process and will be revised / expanded as more detailed information becomes available. The CSM must include a discussion in appropriate detail so that the employer can clearly identify the source, pathway and receptor linkages and risks that may require further assessment or management. The CSM must include: Nature, extent and concentration of the contaminants, contamination migration pathways, fate and transportation modelling and assessment, potential receptors, exposure routes and uncertainties and/or limitations
- A preliminary Risk Assessment to identify whether there is a risk to surface and groundwater bodies and the sensitivity of the water resource to pollution.

2.2.2 Phase 2 – Detailed Site Assessment and Report

The Phase 2 investigation is a detailed site investigation and involves the collection and evaluation of site specific data. The collection of data may be through sampling and analysis of soil, air, groundwater and surface water to characterize the site and the nature and extent of the contamination.

In some instances where a Phase 1 Assessment has been undertaken this information will be used to refine the CSM.

This information is used to identify potential and actual risks to human health and the environment.

It entails the characterization of the contamination and site conditions.

- characterization of the type, extent and level of contamination on the site
- Definition and delineation of the horizontal and vertical extent of the contamination and identification of the boundary of the contamination plume.
- Contamination migration pattern and rate
- Estimate of the volume of contaminated soil and volume of product within the soil.
- Determine the extent to which the groundwater has been contaminated including an estimate of the volume.
- The potential health and environmental impacts of the site (air, water and soil).
- The nature of the samples collected, the sampling procedures followed including Quality Assurance and Quality Control.
- Analysis undertaken, methodologies used and laboratory Quality Assurance and Quality Control procedures including laboratory certificates and appropriate accreditation listings
- Sampling and analysis quality control plan to ensure that the required number of samples and locations of all media are collected are representative and sufficient to address gaps identified and uncertainties in the CSM so that the information obtained allows for reliable site management decisions
- Quality Assurance and Quality Control Plan
- Sampling strategy – Sampling and Analysis Quality Plan
- Fate and Transport Model
- Risk Assessment to human Health and the environment of all vectors i.e. soil, water and air
- Develop relevant site specific remediation targets to protect receptors.
- Refinement of the Phase I Conceptual Site Model
- Stakeholder Engagement

The Detailed Site Assessment Report must contain the data quality objectives, quality assurance and quality control plan, data evaluation, refinement of the CSM and identification of risks, limitations and uncertainties.

Site Assessments and remediation are by their very nature costly. Therefore Transnet believes that a holistic, tiered risk-based approach based on international best practice be adopted.

The three key components of a contaminated site that need to be understood are the source, pathway and receptor (human or ecological). A risk only occurs when there is an exposure to the receptor/s to understand the linkages and exposure a conceptual site model must be developed that depicts the pathways between source and receptor.

2.2.3 Phase 3 – Site Remediation Objectives and Plan

Develop Site Remediation Objectives/Criteria and a Site Remediation Plan for the remediation of the site. The remediation technology/s must be able to achieve these objectives/criteria.

The site remediation plan must be prepared as follows:

- Develop remediation objectives/criteria, targets and Key Performance Indicators that ensure the site will be suitable for its current or future land-use that will pose acceptable risk to human health or the environment either on-site or off-site.
- Detailed documented procedures to achieve the remediation objective.
- Establish safeguards and contingency for safe implementation of all remedial activities.
- Develop the Quality Assurance and Control monitoring plan that will ensure compliance to the remediation plan.
- Assessment of the remediation options to select the preferred most cost effective technology for the remediation of the site, and time estimates to remediate the site.
- Develop site monitoring strategy where no risk is identified inclusive of relevant Site Specific Target Levels, costs and timeframes for the work.
- Develop a Remediation Action Plan where site is required to be remediated

2.3 Reports

At the end of each Phase the Consultant will submit to the Employer an electronic copy. The Report must contain the information as described in the Department of Environmental Affairs Framework for the Management of Contaminated Sites (2010) for each Phase namely:

Phase 1 Report

- Executive Summary
- Introduction
- Site Plans
- Site History
- Site Condition and Surrounding Environment
- Geology, Hydrology and Hydrogeology (Regional and Site Specific)
- Background Soil and Groundwater Quality
- Conceptual Site Model
- Sampling and Analysis Quality Plan

- Laboratory Analysis including Quality Assurance and Quality Control
- Results
- Risk Assessments (Human Health and Ecological)
- Mitigation Measures to Reduce the Risk to acceptable Standards
- Stakeholder Engagements
- Conclusions
- Recommendations and Costs to move to Phase II

The contractor to present the work undertaken, results of the Risk Assessment, Scope of Work for Phase 2 with associated Cost to the Employer in Power Point after the submission of the report.

Phase 2 Report

- Executive Summary
- Introduction
- Summary of Phase I Reporting
- Investigation of Site Geology, Hydrology and Hydrogeology
- Refinement of Phase I Conceptual Site Model
- Sampling and Analysis Plan and Sampling Methodology
- Field Quality Assurance and Quality Control
- Laboratory Quality Assurance and Quality Control
- Site Characterisation
- Results
- Risk Assessments (Human Health and Ecological)
- Mitigation Measures to Reduce the Risk to acceptable Standards
- Stakeholder Engagements
- Conclusions
- Recommendations and Costs to move to Phase III
- The report must conclude whether:
  - further clean up measures are required and the type of clean up measures with costs are required;
  - remediation measures must take place immediately or over a period of time
  - management measures must be applied and the type of management measures;
  - on-going monitoring is required or

- a combination of the above
- The report must identify the most sustainable remediation option/s based on environmental, economic and social indicators so that optimum remediation option is selected
- The evaluation of the options must be carried out by using a Multi Criteria Analysis (MCA). Some of the criteria to be used in the MCA are cost, complexity, time, space, social impact and efficiency of the remedial technology.
- All proposed remediation must be based on the principles of sustainable remediation as defined in SURF-UK or similar internationally recognised standard on sustainable remediation.

The contractor is to present the work undertaken, results of the Risk Assessment, Scope of Work for Phase 3 with associated Cost to the Employer in Power Point.

Phase 3 Report

- The Remediation Plan must meet the requirements of Table 3 of the Department of Environmental Affairs Framework for the Management of Contaminated Land (2010).
- Contact details of all key personnel, consultants, contractors and authorities i.e. telephone numbers – work and cellular. Email address/s, physical address
- Identification of all contaminants of concern and the media affected
- Identification of the proposed clean up criteria and methods
- Identification, quantification and characterization of the materials to be treated/removed
- A summary of remedial options that were evaluated and the method to select the preferred remedial strategy
- The selected clean up method and its technical feasibility with cost
- A detailed implementation plan including a project schedule to execute the work
- The control measures to minimize fugitive emissions, surface water control and worker health and safety
- Identification of the fate of residual contaminants
- Identification of remedial verification and long-term monitoring plans.

The contractor is to present the work undertaken to the Employer in Power Point.

2.4 Stakeholder engagement for data collection

The contractor shall be required to engage/involve and obtain input from all relevant stakeholders when:

- Undertaking Risk and other Assessments specified above
- Obtaining access to property, infrastructure and other similar situations

Key Stakeholders to be consulted include but are not limited to:

- Department of Forestry, Fisheries and Environment (DFFE);
- Other authorities
- Landowners
- TPL

3 MONITORING OF REMEDIATION PLAN

The monitoring of the Remediation Contractor on the implementation of the remediation plan.

- Undertake an environmental monitoring to ensure that the Remediation Contractor is compliant with the remediation plan.
- Prepare and submit a monitoring report.
- The remediation of the site has met all the objectives and is ready for site closure

4 GENERAL REQUIREMENTS

The *Contractor* in the provision of services shall observe all relevant statutes, by-laws and associated regulations, applicable standards published by the South African Bureau of Standards, the International Organization for Standardisation or learned societies and standards of professional conduct, and "best practice", as laid down, or recommended, by their respective professional associations, if any.

The *Contractor* must appoint and manage specialist studies as requested by TPL and authorities.

The travelling mileage (round- trip) per site from the *Contractor's* offices must not exceed 800 km.

5 OWNERSHIP OF DATA, DESIGNS AND DOCUMENTS

The *Parties* shall agree that copyright in the data, design and documents shall, after payments by the *Employer* of the services to the *Contractor* 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 *Contractor* infringement of copyright.