



**ENVIRONMENTAL MANAGEMENT AND  
MONITORING PLAN  
FOR THE PROPOSED CYCLIC STEAM  
STIMULATION PROJECT IN THE  
TAMBAREDJO OILFIELD, SARAMACCA  
2019**

**Report prepared by:**



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**Abbreviations**

CCU	Corporate Communications Upstream
CSS	Cyclic Steam Stimulation
DO	Drilling Operations Division
ELT	Ecological Land Type (see review study)
EOR	Enhanced Oil Recovery
ERP	Emergency Response Plans
EMMP	Environmental Management and Monitoring Plan
GFI	General Field Instruction
HSE	Health, Safety and Environment
HSEQU	Health, Safety, Environment and Quality Upstream
IOR	Improved Oil Recovery
MUMA	Multiple Use Management Area
PS & PS	Plant Security and Personnel Services
SOM	N.V. Staatsolie Maatschappij Suriname (Staatsolie)

## 1 INTRODUCTION

Staatsolie Maatschappij Suriname (SOM) intends to extend oil production in the Tambaredjo Oilfield by implementing a cyclic steam stimulation (CSS) project. SRK Consulting (South Africa) (Pty) Ltd (SRK) undertook a Limited Environmental and Social Impact Assessment (ESIA) process and updated SOM's EMMP, as required by the Nationaal Instituut voor Milieu en Ontwikkeling in Suriname (NIMOS).

This EMMP aims to demonstrate how environmental management and mitigation measures identified in the Limited ESIA Report will be implemented. The mitigation measures apply to the following phases of the development process:

- Design Phase: These measures relate to the detailed layout, planning and design of the project (including associated infrastructure), and will largely be implemented by the planning and development team, prior to the commencement of any physical on-site activities. These mitigation measures are presented in Section 3.1.1;
- Construction Phase: These mitigation measures are applicable during site preparation and construction on the site of the project (including associated infrastructure) and must be implemented by the relevant contractors and sub-contractors. These mitigation measures are presented in Section 3.1.2;
- Operational Phase: These mitigation measures are applicable during the long-term operation and maintenance of the project (including associated infrastructure) and must be implemented by SOM. These mitigation measures are presented in Section 3.1.3; and
- Decommissioning Phase: These mitigation measures are applicable during the decommissioning phase of the project (including associated infrastructure) and must be implemented by the SOM. These mitigation measures are presented in Section 3.1.4.

Monitoring measures are provided in Section 3.2.

### 1.1 SITE AND PROJECT DESCRIPTION

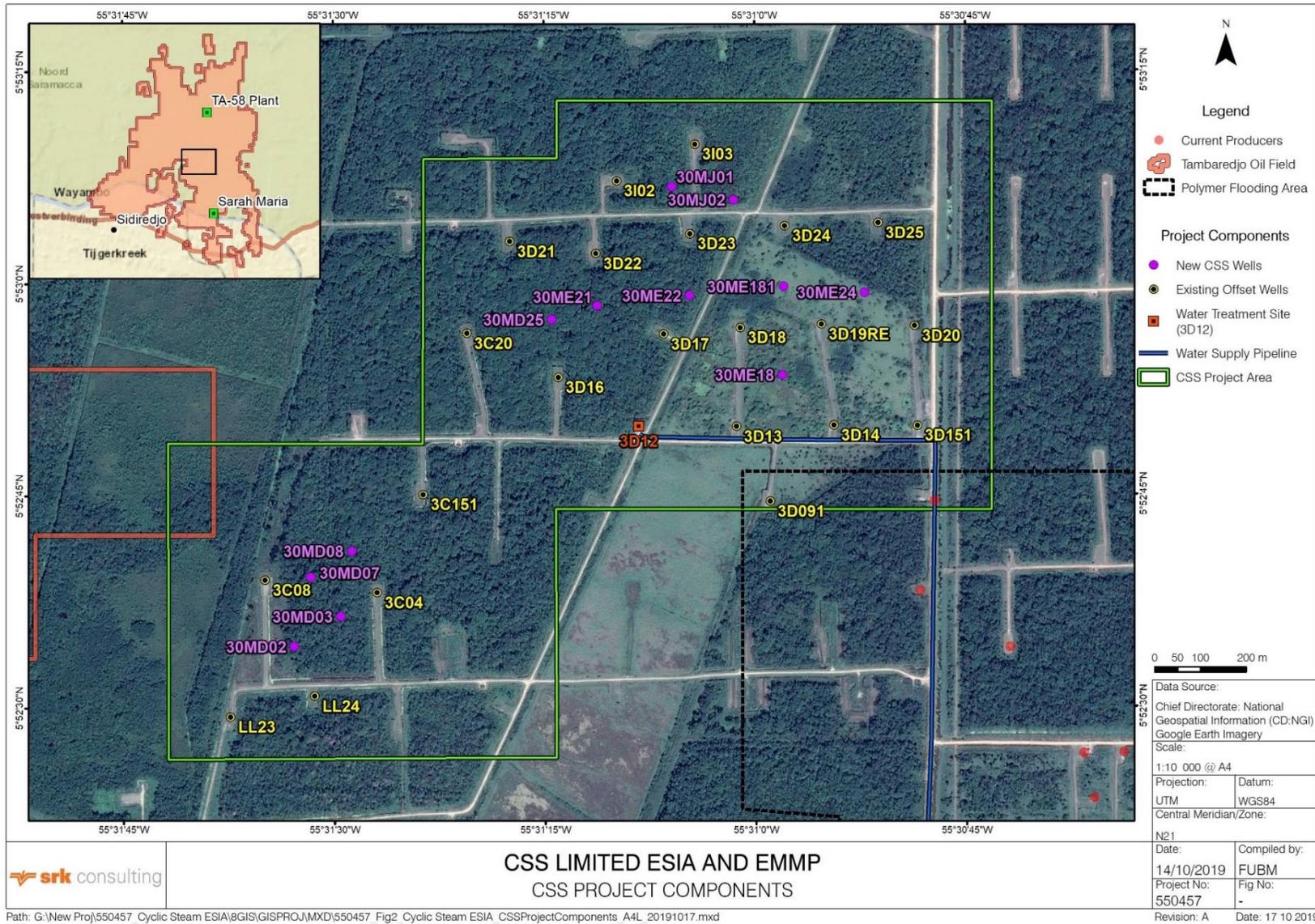
*A more detailed description is provided in the Limited ESIA Report.*

The project area is located in the Tambaredjo Oilfield, 40 km west of Paramaribo and 8 km south of the coast, in the Saramacca District of Suriname. The Tambaredjo field is located between the East-West Connection Road and the coast, and mostly north of the Saramacca River.

The oilfield has been operated by Staatsolie since the 1990s. The original swamp habitat has been replaced by secondary marsh vegetation, which is characterised as a modified habitat. The polder is used for oil production from a large number of wells. The polder is traversed by unpaved roads and activity level is intense. The polder is drained by a system of roadside ditches that are connected to main canals. The north-south trending canals drain into the Saramacca River.

The proposed CSS project is located in the central section of the Tambaredjo Oilfield (see Figure 1-1). Ten new CSS wells will be drilled between existing producers in the Tambaredjo Oilfield in an area where Staatsolie has been producing oil for extended periods of time. The project also includes construction and operation of a water treatment plant to filter and soften water prior to use in the steam generator and construction / extension of access roads and water and oil pipelines. Water is abstracted from the Saramacca River and supplied via the Polymer Flooding infrastructure.

The CSS process entails the injection of up to 200 tons of steam per day into the reservoir down a well for ~20 days, followed by a soaking period of ~10 days during which the well is sealed and the oil becomes less viscous, and subsequent extraction of the oil from the same well for ~1 year, before the cycle is repeated. Two injections cycles are planned for this project. Wells will be injected sequentially, as one Once-Through Steam Generator (OTSG) will be used and moved from well to well.



Figure

1-1:

Project

components

Key steps in the CSS process are briefly described below:

- **Cold Production:** Oil - from the T1 and T2 layers - will be produced from the new CSS wells in the conventional way (cold production) for at least two months prior to CSS;
- **Steam Injection:** After the initial cold production ends, the well will be converted for steam injection and hot production by retrieving the conventional production string and installing a thermal-specific injection tubing, thermal-resistant pump and thermal-rated downhole pressure and temperature gauges. Some 150 - 200 tons of steam (equivalent to 945 – 1 260 bbl water) will be produced by a OTSG and injected per well per day at a maximum temperature of 600 °F (315 °C) for 15 - 20 days;
- **Soaking:** The well will be shut for 7 to 10 days to allow the heat to dissipate in the near-well area, reducing the oil viscosity and facilitating oil flow towards the well. As the effect of steam is intended to affect only the area around the injection well, surrounding offset producers will be monitored to verify whether they are affected;
- **Hot Production:** After soaking, the well will be converted to a hot producer by installing and/or connecting the pump to initiate production that will generate hot oil and water as well as possibly increased gas volumes; and
- **Treatment:** The produced fluid<sup>1</sup> will be conveyed via pipelines to the TA-58 crude treatment plant, where the fluid is collected in tanks for treatment. The water and minimum quantities of gas in the produced fluid will be separated from the crude, which will then be stored in tanks prior to transportation to the refinery. The produced water will be treated to remove remaining oil and other substances and is then discharged into the Saramacca River.

Depending on the results of the CSS project, wells may be subject to additional steam injection cycles and/or other subsequent EOR methods. Failing that, wells will continue producing as regular cold production wells while economically viable. As such, the end of the CSS pilot project does not necessarily signal the end of (cold) oil production at the CSS wells or the Tambaredjo Oilfield in general, and only partial decommissioning of CSS components would be required if CSS is discontinued. Leased equipment (such as the steam generator) will be shipped back to the service provider(s) after completion of the steam injection program. Pipelines will be removed if no longer required.

## 1.2 ENVIRONMENTAL MANAGEMENT

Compliance with the provisions of a number of Staatsolie documents that address Health, Safety, and Environmental (HSE) issues are mandatory, principally:

- **Health, Safety & Environmental and Quality Policy:** is aimed at continually improving performance and aspires to prevent harm to the safety and health of its Employees, contractors, neighbors, and the environment.
- **GFI's:** general procedures to guide Staatsolie's operations so that it complies with the HSE policy. GFI's applicable to this project are listed in Appendix E.
- **Community Relation Policy:** is aimed at performing business activities in such a way that communities' interest and expectations with regard to socio-environmental aspects are properly considered.

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<sup>1</sup> Mix of oil, water and gas.

### **1.3 DESCRIPTION OF THE EMMP**

#### **1.3.1 Purpose and Scope of the EMMP**

The purpose of this EMMP is to set out the management and monitoring measures required to minimize the environmental impacts of design, construction, operations and decommissioning of the CSS project, and to ensure that responsibilities and appropriate resources are efficiently allocated to the project.

#### **1.3.2 Structure of the EMMP**

This EMMP is made up of three parts:

##### **Part 1: Introduction**

Provides brief background to the project and sets out corporate environmental management requirements as well as a brief description of the purpose, scope and structure of the EMMP.

##### **Part 2: Environmental Management Procedures**

Sets out the roles and responsibilities for implementation of the EMMP, environmental training requirements, emergency response planning, and monitoring requirements.

##### **Part 3: Environmental Specifications**

Explains the approach adopted to develop the environmental specifications and sets out the actual specifications in tabular form.

## 2 ENVIRONMENTAL PROCEDURES

### 2.1 PROCESS OWNERS

All processes within Staatsolie are owned by a Process Owner. Table 2-1 provides an overview of the different processes of the CSS project and the responsible Process Owner.

**Table 2-1: CSS Process Owners**

Process	Process Owner
Construction and rehabilitation of infrastructure and drilling locations and sites for CSS Operations	Manager Drilling Operations
Drilling and completion of CSS <sup>2</sup> wells	
Well plugging and abandonment	
Decommissioning of wells	
Treatment of produced fluid of the CSS project	IOR/EOR Program Manager/ Manager Treatment & Delivery
The design, engineering and construction of all pipeline facilities; pumping, pipeline and storage facilities for fuel supply; power supply and communication.	Manager Development and Technical Support
Steam injection and water treatment process	IOR/EOR Program Manager
Completion and services CSS wells and offset <sup>3</sup> wells	Manager Lifting & Gathering
Monitoring and maintenance of the CSS and offset wells	

### 2.2 ROLES AND RESPONSIBILITIES

This section is intended to ensure that an accountability process is defined and implemented to make certain that responsibilities are performed effectively. The general roles and responsibilities of various parties are outlined in Table 2-2.

**Table 2-2: CSS Project Roles and Responsibilities**

Position	HSE responsibility
Upstream Director	Overall accountability for HSE matters for all upstream operations.
Manager Development & Technical Support	Overall responsibility for HSE matters with regards to activities during the design, engineering and construction of all pipeline facilities, power supply, fuel supply and communication.
Manager Drilling Operations	Responsibility for HSE matters related to site preparation, construction of roads, drilling, plug and abandonment and decommissioning in compliance with international best practices as specified in ESIA/EMMP
IOR/EOR Program Manager	<ul style="list-style-type: none"> <li>Overall responsibility for HSE matters with regards to activities during the design, commissioning, operational, fluid treatment and decommissioning phase of the project.</li> <li>Responsibility for HSE matters related to steam generation facilities and CSS wells.</li> </ul>

<sup>2</sup> CSS wells are producers that are stimulated by steam injection for a short period of time. These wells are NOT exclusively injectors like in polymer flooding.

<sup>3</sup> Offset wells are existing producers in the direct surroundings of the CSS wells.

Position	HSE responsibility
Manager Treatment & Delivery	Responsibility for HSE matters related to the TA58 Crude Treatment Facility.
Corporate Communication Upstream Head	Overall accountability of Corporate Communication support for all activities within the Upstream Operations.
Manager Lifting & Gathering	Responsibility for HSE matters related to the operations, maintenance and decommissioning of the oil wells within the oilfield.
HSEQ Upstream Manager	Responsibility to support the operations and monitor the performance with regards to HSE matters.
SOM Employees and contractors	Shall be aware of the EMMP requirements and adhere to the relevant mitigation measures.

### 2.2.1 Managers Upstream Operations

The IOR/EOR Program Manager, Drilling Operations (DO) Manager, Lifting and Gathering Manager and Treatment and Delivery Manager shall all within their departments:

- Ensure that the key on-site staff (contractor-supervisors) are duly informed of the EMMP and associated responsibilities and implications of this EMMP prior to commencement of construction (in order to minimize undue delays);
- Inform key on-site staff through initial environmental awareness training of their roles and responsibilities in terms of the EMMP;
- Ensure that a copy of the EMMP shall be available to all on site Construction and Drilling Contractor Field Supervisors;
- Inform the environmental engineer **one week** before the date of the commencement of the project (this date being the day on which preparations of steam injection activities will start);
- Perform weekly HSE inspections based on the EMMP checklist (Appendix B) and submit weekly HSE reports to the HSEQ Upstream Manager (based on reporting scheme in Table 2-3 in Section 2.5.4);
- Undertakes a post-decommissioning inspection upon completion of each location, which may result in recommendations for additional clean-up and rehabilitation measures;
- Ensure that method statements are submitted to the Environmental Engineer for tasks requiring such; and
- Ensure that action items to rectify non-compliance are closed out in a timely and satisfactory manner.

### 2.2.2 HSEQ Upstream Manager

The HSEQ Upstream Manager shall:

- Identify areas of non-compliance and propose action items to rectify them in consultation with the IOR/EOR Program Manager/Project Leader;
- Undertake spot inspections to determine compliance with the EMMP and monitor the activities of the contractor on site with regard to the requirements outlined in this EMMP;
- Alert when action items intended to remedy non-compliance are not closed out in a timely and satisfactory manner;
- Compile compliance reports;

- Submit reports on the implementation of the EMMP and non-compliance to the NIMOS; and
- Undertake a post-decommissioning inspection upon completion of the project area, which may result in recommendations for additional clean-up and rehabilitation measures.

### **2.2.3 SOM Divisions/ Process Owner -representatives and Contractors**

The Process Owner-representatives and Contractors delivering services to the project have a duty to demonstrate respect and care for the environment in which they are operating. The Process Owner-representatives and Contractors shall comply with the specifications of the ESIA and EMMP and abide by the instructions of the relevant Process Owner and the HSEQ Upstream Manager and its delegates regarding the implementation of the EMMP. The Process Owner-representatives and Contractors shall report to the relevant Process Owner or the HSEQ Upstream Manager on all matters pertaining to the EMMP.

The Process Owner-representatives shall:

- Ensure that copies of the EMMP shall be available at their offices, and shall also ensure that all personnel on site (including Sub-Contractors and their staff, and suppliers) are familiar with and understand the requirements of the EMMP;
- Ensure that all activities under the control of their department are undertaken in accordance with the following:
  - HSEQ Policy,
  - Community Relations Policy,
  - All applicable Staatsolie GFIs,
  - The EMMP;
- Ensure that all employees and sub-contractors comply with this EMMP;
- Compile Method Statements as listed hereunder;
- Ensure that any problems and non-conformances are remedied in a timely manner, to the satisfaction of the responsible Process Owner;
- Ensure that all personnel are aware of the Emergency Response Plan and are adequately trained therein;
- Compile the required reports (see Table 2-3, to be submitted to the HSEQ Upstream Manager).

## **2.3 ENVIRONMENTAL TRAINING**

Environmental awareness training courses shall be run for all personnel on site. It is incumbent upon the IOR/EOR Program Manager to convey the objectives of the EMMP and the specific provisions of the EMMP to all personnel involved in the design, construction, operation and decommissioning of the CSS project.

Environmental training must cover the specific environmental management requirements as set out in the EMMP, but must also ensure that all on-site staff are aware of and familiar with the relevant requirements and principles/objectives of the HSEQ Policy, emergency response plans, applicable procedures (GFIs) and the EMMP.

The HSE Site Officer will initiate the training sessions for all new or additional staff, and the HSE department shall support with Environmental Awareness Courses (Integrated Health, Safety and Environmental Inductions). Contractors shall ensure that all staff attend the awareness courses to be held not less than one week before the Commencement Date. Where applicable, Contractors shall

provide job-specific training on an ad hoc basis when workers are engaged in activities that require Method Statements.

A copy of the EMMP shall be available on site, and the Contractors shall ensure that all the personnel on site (including Sub-Contractors and their staff) as well as suppliers are familiar with and understand the specifications contained in the EMMP.

Operation training will include information on:

- Current land and water use;
- Clearing, access and transportation;
- Waste minimization, handling and disposal methods;
- Fire and spill prevention and control;
- Emergency response procedure (Health, Safety and Environmental issues);
- Handling and storage of hazardous materials, fuels and oils; and
- Reclamation measures.

## **2.4 COMMUNITY ENGAGEMENT**

### **2.4.1 Introduction**

Community or stakeholder engagement describes the ongoing, interactive relationship between Staatsolie and the community. It is about building and maintaining constructive relationships over time. It is an ongoing process between the company and its project stakeholders that extends throughout the life of the project and encompasses a range of activities and approaches, from information sharing and consultation, to participation, negotiation, and partnerships. It enables people to be informed about local issues related to Staatsolie activities and to contribute ideas and help identify solutions. It strengthens community cooperation and builds the people's trust. Staatsolie recognizes the value of involving the community in its HSEQ policy which includes as one of the key-elements: *"Communication of the Health, Safety and Environmental policy, objectives and targets, and other relevant matters to all employees, contractors and stakeholders"*.

The nature and frequency of community engagement should reflect the level of project risks and impacts.

Within Staatsolie, community engagement is in effect the responsibility of the Corporate Communication Upstream (CCU) department of Staatsolie. This engagement also includes access to private land and land leased from the government. The involved land owners have been (or will be) contacted and the project activities on their land have been (or will be) discussed.

A statement of approval and an agreement have to be agreed on. Furthermore, the Community Relations Officer has organized meetings with the district government, other government organizations, farmers and residents in order to inform them on the coming activities and to discuss.

### **2.4.2 Purpose**

Community engagement in the current context is seen as the way of interacting with residents / stakeholders. It is an ongoing process which allows a two-way communication. Stakeholders / residents and Staatsolie will both benefit from community engagement. The purpose is to help outline how Staatsolie will obtain a better understanding of the public's interest and perspective regarding their activities in the Saramacca area. It also helps people within the community feel involved in and be heard in the project.

In order for Staatsolie to understand the concerns, needs and aspirations of the community, Staatsolie needs to create this two-way communication. This can be achieved through:

- Keeping the community informed about issues that affect, or are important to the community; and
- Creating avenues for Staatsolie to listen to issues that affect, or are important to, the community

Meaningful community engagement usually results in minimization of vagueness, conflict and delays, and the establishment of relationships in the local community that can benefit current and future projects. It can limit the number of surprises that occur during a project because all parties share information openly and consistently.

## **2.5 IMPLEMENTATION OF EMMP**

This section provides a description of the methods that will be used to implement the EMMP and monitor performance against EMMP commitments.

### **2.5.1 Method Statements**

Method statements are to be compiled by Process Owner-representatives for approval by their Process Owner, who reviews and endorses them. The HSEQ Upstream Manager must receive a copy of the method statement for review 2 weeks before commencement of the activity and if there are any issues regarding the environmental specifications he/ she shall make these known to the Process Owner within a week. The method statement typically shall cover applicable details including, but not limited to:

- A reference to the environmental specifications;
- Description of the activities to be undertaken;
- Location where activities will be undertaken, and if on privately owned land the name of the land owner;
- Map of the location;
- Construction drawings;
- Materials and equipment requirements;
- How and where material will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Timing of activities (start and end dates); and
- Assurance that the landowner/user is aware of the planned activity.

The following method statements for construction shall be submitted to the Process Owner not less than 14 days prior to the intended date of commencement of the activity:

- Site camp;
- Site preparation;
- Construction activities;
- Setting up or changing of access routes;
- Construction of dams and water management structures;

- Changes of dams and water management structures;
- Movement of rig;
- Movement of OTSG;
- Conversion of well for steam injection and hot production; and
- Large transports along clay dams.

Contractors / Process Owner Representatives shall abide by these approved method statements.

Appendix A provides a pro forma method statement sheet that must be completed by the process owner for each activity requiring a method statement as specified above.

### **2.5.2 Monitoring**

Respective Process Owners together with the HSEQ Upstream Division are responsible for monitoring the performance of on-site personnel against the commitments of the EMMP. Overall control for this function will lie with the HSEQ Upstream Manager, and responsibility for day-to-day monitoring will lie with the Process Owner representatives. The Process Owner is obliged to, and will have the power to, suspend activities if they do not comply with the performance standards specified in the EMMP.

The following principal items will be monitored:

- Correct implementation of EMMP; and
- Compliance with Method Statements.

Monitoring of specific environmental parameters is addressed separately in Section 3.1.5.

Weekly HSE inspections are required during construction, using the checklist provided in Appendix B. These completed checklists must be submitted to the HSEQ Upstream Manager at the end of each week.

### **2.5.3 Data and Information Management**

Quantitative data should be stored in the Staatsolie Environmental Statistics database, which will allow systematic storage and manipulation of data, and will permit rapid retrieval for the purposes of internal and external reporting. The representatives of the HSEQ Upstream Manager will administer this database.

In order to ensure a consistent and coherent system for documenting the implementation of the EMMP, all written records and other information will be stored in a filing system that is compatible with the requirements of the existing HSE Management System. This will comprise standardized forms, documents and reporting procedures.

### **2.5.4 Reporting**

The frequency and nature of reporting of environmental management performance will depend on the nature of the activity and aspect that is being managed. Reporting will primarily consist of reports to the IOR/EOR Program Manager, on critical issues, as required. Table 2-3 below gives an overview of the other obligatory reporting lines.

These requirements apply throughout the CSS process, i.e. during injection, soaking and hot production, until wells start producing as regular cold production wells, when standard reporting requirements applicable to existing producers will become applicable.

**Table 2-3: Regular reports and report lines**

Report Name	Description	Frequency	Responsible	Recipient
Water quality monitoring reports	Reports of water quality monitoring done for the project (Staatsolie Environmental Statistics Database)	Monthly	Treatment & Delivery Manager/ IOR/EOR Program Manager	HSEQ Upstream Manager
Offset well monitoring reports	Reports of temperature measured in offset wells	Monthly	Lifting & Gathering Manager	HSEQ Upstream Manager
Safety talks reports	Reports of talks (Safety Talk Database)	Monthly	All Process Owners	HSEQ Upstream Manager
HSE Inspection	Compliance with EMMP	Weekly	All Process Owners	HSEQ Upstream Manager
Incidents	Report type and consequences for loss of days (Achiever plus Database)	When accident occurs	All Process Owners	HSEQ Upstream Manager
Reports of drills held	Drills as emergency response etc.	Yearly	All Process Owners	HSEQ Upstream Manager
Method statement	Method statements	Two weeks before commencement of activity	All Process Owners	HSEQ Upstream Manager
Compliance Reports	Report with specification on the compliance with the EMMP	Quarterly	HSEQ Upstream Manager (with input of process owners)	NIMOS

### 2.5.5 Feedback

Feedback on performance will be communicated to the appropriate parties concerned. Any substandard performance will trigger a process that notifies the responsible party of the nature of the issue and indicates the actions that are required to rectify the situation. This will be followed up by further monitoring to ensure that the sub-standard performance has been corrected.

### 2.5.6 Corrective Action

Corrective action is a critical component of the implementation–review–corrective action–implementation (or plan-do-check-act) cycle and it is through corrective action that continuous improvement can be achieved. Where repeated non-compliance is recorded, procedures may need to be altered accordingly to avoid the need for repeated corrective action.

If environmental compliance monitoring indicates non-conformance with the EMMP or accepted Method Statements, the HSEQ Upstream Manager will formally notify the Process Owner through a Corrective Action Request. The Corrective Action Request documents:

- The nature of the non-conformance/environmental damage;
- The actions or outcomes required to correct the situation; and
- The date by which each corrective or preventive action must be completed.

Upon receipt of the Corrective Action Request, the Process Owner will be required to produce a Corrective Action Plan (or similar plan), which will detail how the required actions will be implemented. The Corrective Action Plan must be submitted to the HSEQ Upstream Manager for acceptance prior to implementation. Once it has been accepted, the corrective action must be carried out within the time limits stipulated in the Corrective Action Request. Additional monitoring by the HSEQ Upstream Manager, or his/her delegate, will then be required to confirm the success or failure of the corrective action.

### 3 ENVIRONMENTAL SPECIFICATIONS

#### 3.1 APPROACH TO THE EMMP AND ENVIRONMENTAL MANAGEMENT MEASURES

The general principles contained within this section shall apply to all activities for the duration of the design, construction, operation and decommissioning phases of the CSS project. An environmental impact is defined as any change to the existing environment, either adverse or beneficial, that is directly or indirectly the result of the project and its associated activities. Impacts are generated by certain aspects of those activities. In the context of this document, an aspect is defined as *“an action, event, product or service, occurring as a component or result of an activity, which interacts with the existing environment”*.

The fundamental approach adopted in the compilation of this EMMP is that management effort should be focused on environmental aspects to prevent impacts from occurring, i.e. a proactive approach. Proactive measures are then backed up with reactive measures, which serve to minimize the severity or significance of the impact, if it cannot be prevented at source. A series of tables incorporating management measures has been developed and grouped to cover the main activities that give rise to potential impacts during the design, construction, operation and decommissioning phases. Each table provides further detail on the following:

- Prescribed mitigation measure(s);
- Implementation timeframe;
- Monitoring and performance evaluation, including performance indicators and monitoring methods; and
- Identification of the person(s) responsible for implementation of the mitigation measure(s).

Management measures specific to the individual project phases are presented in Section 3.1.1 (Design Phase), 3.1.2 (Construction Phase), 3.1.3 (Operation Phase) and 3.1.4 (Decommissioning Phase).

General environmental management measures applicable to all phases of the project are presented in Section 3.1.5, addressing hazardous materials, repair and maintenance, stormwater management, noise and emissions management, dust management, concrete / cement work, fire management, traffic management, transportation and refueling, employment, environmental awareness training and complaints and grievances.

Section 3.1.6 provides measures that must be taken in response to environmental pollution events.

Appendix F provides waste management measures in the Waste Management Plan.

### 3.1.1 Design Phase

The environmental management and mitigation measures that must be implemented during the design phase, as well as responsibilities and timelines for the implementation of these measures and monitoring thereof, are laid out in Table 3-1.

**Table 3-1: Environmental management and mitigation measures that must be implemented during the *Design Phase***

Design Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods	Performance Indicators
<b>Tenders</b>	1.	Include the EMMP in all tender documents to ensure that sufficient resources are allocated to environmental management by the Contractor.	• IOR/EOR Program Manager	• When issuing tenders	• Keep record of tender documentation	• Ensure EMMP requirements are addressed in bids
<b>Water treatment plant design</b>	2.	Design hazardous material storage facilities, especially fuel and chemicals used for water treatment, with suitable impermeable materials and a minimum bund containment capacity equal to 110% of the largest container. Install a roof if possible to prevent stormwater contamination from these areas.	• IOR/EOR Program Manager	• During design phase	• Review detailed layout plans	• Approval of final design
	3.	Route stormwater around the plant as much as possible to minimize the potential for contaminating runoff.				
	4.	Place fuel and hazardous material tanks / containers on an impermeable surface and within an appropriate bund (at least 110% of the largest tank) from which any spills / leaks can be collected and pumped into a backup tank. Install a roof if possible to prevent stormwater contamination from these areas.				
<b>Infrastructure</b>	5.	Design pipelines with low pressure cut-out valves (or similar engineered safety devices) along the pipeline network, to prevent leakages.	• IOR/EOR Program Manager	• During design phase	• Review design	• Inclusion of cut-off valves
<b>TA-58 treatment plant</b>	6.	Complete studies to determine the most appropriate treatment of produced fluid from CSS wells (including H <sub>2</sub> S management).	• IOR/EOR Program Manager	• During design phase	• Regular progress reporting	• Appropriate modifications identified • Facilities checked

### 3.1.2 Construction Phase

The environmental management and mitigation measures that must be implemented during the construction phase, as well as responsibilities and timelines for the implementation of these measures and monitoring thereof, are laid out in Table 3-2.

**Table 3-2: Environmental management and mitigation measures that must be implemented during the *Construction Phase***

Construction Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods	Performance Indicators
<b>Site camp</b>	1.	Submit a Method Statement for Site Camp establishment for acceptance by Staatsolie at least two weeks prior to the start of construction activities.	<ul style="list-style-type: none"> <li>• IOR/EOR Program Manager / Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• Start of construction</li> </ul>	<ul style="list-style-type: none"> <li>• Visual inspections</li> <li>• Method Statement</li> </ul>	<ul style="list-style-type: none"> <li>• Accepted Method Statement</li> <li>• Site boundaries demarcated</li> <li>• Signage in place</li> </ul>
	2.	Establish a suitably fenced Site Camp at the start of the contract, which will allow for site offices, vehicle, equipment, material and waste storage areas to be consolidated as much as possible. Provide water and / or sanitary facilities at the Site Camp for personnel.				
	3.	Demarcate construction site boundaries upon establishment. Control access to the site. Fence off site boundaries and ensure that plant, labour and materials remain within site boundaries.				
	4.	Designate the area beyond the boundary of the site as No Go areas for all personnel on site. No vehicles, machinery, materials or people shall be permitted in the No Go area.				
<b>Safety and Security</b>	5.	Ensure that emergency procedures (in relation to fire, spills, contamination of the ground, accidents to employees, use of hazardous substances, etc.) are established prior to commencing construction.	<ul style="list-style-type: none"> <li>• IOR/EOR Program Manager</li> <li>• Staatsolie Manager Drilling Operations</li> </ul>	<ul style="list-style-type: none"> <li>• Throughout construction</li> </ul>	<ul style="list-style-type: none"> <li>• Visual inspection and approval by HSE Site Manager</li> </ul>	<ul style="list-style-type: none"> <li>• Number of safety/emergency incidents.</li> </ul>
	6.	Make all emergency procedures, including responsible personnel, contact details of emergency services, etc. available to all the relevant personnel. Clearly display emergency procedures at the relevant locations around the site.				
	7.	Secure the Site Camp, particularly to restrict unauthorized access to fuels and any other hazardous substances.				
	8.	Provide suitable emergency and safety signage on site, and demarcate any areas which may pose a safety risk (including hazardous substances, deep excavations etc.).				
	9.	Advise NIMOS of any environmental emergencies (e.g. major spill of a hazardous substance) on site within 24 hours, together with a record of action taken.				
<b>Vegetation clearing</b>	10.	Limit the footprint area of the construction activity to what is essential.	<ul style="list-style-type: none"> <li>• Drilling Operations</li> </ul>	<ul style="list-style-type: none"> <li>• Throughout construction</li> </ul>	<ul style="list-style-type: none"> <li>• Visual inspection</li> </ul>	<ul style="list-style-type: none"> <li>• Size of area cleared relative to development</li> </ul>

Construction Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods	Performance Indicators
	11.	Designate areas outside the development footprint as No Go areas.	Manager			footprint <ul style="list-style-type: none"> <li>• Size of area disturbed outside of construction site boundary</li> </ul>
	12.	Ensure that no vegetation is removed or disturbed outside the delineated construction site boundary.				
	13.	Do not harm, catch or kill animals by any means, including poisoning, trapping, shooting or setting of snares.				
	14.	Safely remove and relocate any fauna that may be physically harmed by construction activities.				
<b>Fauna Management</b>	15.	Do not harm, catch or kill animals by any means, including poisoning, trapping, shooting or setting of snares.	<ul style="list-style-type: none"> <li>• IOR/EOR Program Manager / Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• Duration of construction activities</li> </ul>	<ul style="list-style-type: none"> <li>• Visual Inspection</li> </ul>	<ul style="list-style-type: none"> <li>• Number of animals harmed / trapped</li> <li>• Number of animals relocated</li> </ul>
	16.	Backfill any trenches as soon as pipes have been laid to ensure that the time the trench is exposed is kept to a minimum.				
	17.	Inspect open trenches daily for animals which may have fallen or become trapped.				
	18.	Safely remove and relocate any fauna that may be physically harmed by construction activities.				
<b>Erosion management</b>	19.	Ensure that all roads and tracks used for construction have the appropriate water diversion / erosion control structures.	<ul style="list-style-type: none"> <li>• IOR/EOR Program Manager / Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• Throughout construction</li> </ul>	<ul style="list-style-type: none"> <li>• Visual inspection</li> </ul>	<ul style="list-style-type: none"> <li>• Presence of surface erosion</li> </ul>
<b>Vibration</b>	20.	Implement standard vibration management and monitoring measures during drilling and compacting.	<ul style="list-style-type: none"> <li>• IOR/EOR Program Manager / Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• Throughout construction</li> </ul>	<ul style="list-style-type: none"> <li>• Visual inspection</li> </ul>	
<b>Protection of archaeological and paleontological resources</b>	21.	Compile and implement a chance (archaeological) finds procedure.	<ul style="list-style-type: none"> <li>• IOR/EOR Program Manager / Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• Throughout construction</li> </ul>	<ul style="list-style-type: none"> <li>• Chance finds procedure compiled and implemented</li> </ul>	<ul style="list-style-type: none"> <li>• Number of chance finds</li> </ul>
<b>Well drilling</b>	22.	Use non-toxic drilling fluids when drilling through freshwater aquifers.	<ul style="list-style-type: none"> <li>• IOR/EOR Program Manager</li> <li>• Drilling Operations Manager</li> </ul>	<ul style="list-style-type: none"> <li>• During well drilling and construction</li> </ul>	<ul style="list-style-type: none"> <li>• Review design</li> <li>• Supervise works</li> </ul>	<ul style="list-style-type: none"> <li>• Compliance with requirements</li> </ul>
	23.	Ensure well casing and cementing meets best practice methods and Staatsolie standards to prevent thermal losses into the upper layers above the oil reservoir.				
<b>Visual impacts</b>	24.	Retain screening vegetation around the site (wells) as much as possible.	<ul style="list-style-type: none"> <li>• IOR/EOR Program Manager / Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• Throughout construction</li> </ul>	<ul style="list-style-type: none"> <li>• Visual inspections</li> </ul>	<ul style="list-style-type: none"> <li>• Visibility of project activities from publicly accessible areas</li> </ul>
	25.	Regularly collect and dispose of redundant equipment, waste and litter.				
<b>Ablution facilities</b>	26.	Provide ablution facilities (i.e. chemical toilets) for all site staff at a ratio of 1 toilet per 15 workers (absolute minimum 1:25).	<ul style="list-style-type: none"> <li>• IOR/EOR Program Manager /</li> </ul>	<ul style="list-style-type: none"> <li>• Throughout construction</li> </ul>	<ul style="list-style-type: none"> <li>• Visual inspections</li> </ul>	<ul style="list-style-type: none"> <li>• Number of incidents of</li> </ul>

Construction Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods	Performance Indicators
	27.	Secure all temporary / portable toilets to the ground to prevent them toppling due to wind or any other cause.	Contractor		<ul style="list-style-type: none"> <li>Records of waste disposal</li> </ul>	<ul style="list-style-type: none"> <li>staff not using facilities</li> <li>Number of pollution incidents</li> </ul>
	28.	Maintain toilets in a hygienic state.				
	29.	Dispose of chemicals and treated sewage at an approved waste disposal site or sewage plant.				
<b>Construction site rehabilitation and closure</b>	30.	Remove all construction equipment, vehicles, equipment, waste and surplus materials, including site offices, temporary fencing and other facilities, from the site.	<ul style="list-style-type: none"> <li>IOR/EOR Program Manager /Contractor</li> </ul>	<ul style="list-style-type: none"> <li>Once construction is complete; or</li> <li>Throughout construction if it takes place in phases / different areas sequentially</li> </ul>	<ul style="list-style-type: none"> <li>Visual inspection of site</li> <li>Keep record of rehabilitation measures</li> </ul>	<ul style="list-style-type: none"> <li>Rehabilitation forms an integral part of operations from start-up</li> <li>Construction sites fully rehabilitated within five years</li> </ul>
	31.	Clean up and remove any spills and contaminated soil in the appropriate manner.				
	32.	Ensure that no discarded materials are buried on site or on any other land not designated for this purpose.				
	33.	Ensure that affected areas are rehabilitated following construction.				
	34.	Rehabilitate areas adjacent to the site (if disturbance is unavoidable) to at least the same condition as was present prior to construction.				
	35.	Rehabilitate any disturbed areas as soon as construction in the area is complete.				
	36.	Rehabilitate all project areas as soon as possible after completion of activities in each area, including removing and/or remediating any contaminated soils.				

### 3.1.3 Operation Phase

The environmental management and mitigation measures that must be implemented during the operation phase, as well as responsibilities and timelines for the implementation of these measures and monitoring thereof, are laid out in Table 3-3.

**Table 3-3: Environmental management and mitigation measures that must be implemented during the *Operation Phase***

Operation Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods	Performance Indicators
<b>Steam injection</b>	1.	Manage injection pressures to ensure that steam is not chased / forced beyond the confines of the oil reservoir	<ul style="list-style-type: none"> <li>• IOR/EOR Program Manager</li> <li>• Steam Injection Services Contractor</li> </ul>	• Throughout operations	• Pressure monitoring	• Injection pressure below 700 psi
<b>Air quality</b>	2.	Adopt appropriate technology to ensure power generating units meet appropriate standards and emission guidelines.	<ul style="list-style-type: none"> <li>• IOR/EOR Program Manager</li> <li>• Steam Injection Services Contractor</li> </ul>	• Throughout operations	<ul style="list-style-type: none"> <li>• Record of equipment selection criteria</li> <li>• Maintenance logs</li> </ul>	• Compliance with applicable standards
	3.	Operate the OTSG and any other power generating units according to design specifications and manufacturer's instructions to meet the emission limits.				
	4.	Regularly maintain the OTSG to minimise exhaust emissions.				
<b>Surface water</b>	5.	Treat produced water from the CSS project before discharge.	<ul style="list-style-type: none"> <li>• IOR/EOR Program Manager</li> <li>• Manager Treatment &amp; Delivery</li> </ul>	• Throughout operations	• Effluent analysis	• Compliance with standards

### 3.1.4 Decommissioning Phase

The environmental management and mitigation measures that must be implemented during the design phase, as well as responsibilities and timelines for the implementation of these measures and monitoring thereof, are laid out in Table 3-1.

**Table 3-4: Environmental management and mitigation measures that must be implemented during the *Decommissioning* Phase**

Decommissioning Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods	Performance Indicators
<b>Decommissioning planning</b>	1.	Plan and make adequate financial provision for rehabilitation and restoration activities.	<ul style="list-style-type: none"> <li>• IOR/EOR Program Manager</li> </ul>	<ul style="list-style-type: none"> <li>• Initiate at least 1 year before planned decommissioning</li> </ul>	<ul style="list-style-type: none"> <li>• Regular progress reporting</li> </ul>	<ul style="list-style-type: none"> <li>• Determination of closure objectives and requirements</li> </ul>
	2.	Initiate consultation with key stakeholders (e.g. private land owner, Department of Public Works, community) before any planned decommissioning to discuss potential decommissioning options, methods and requirements.				
	3.	Determine other potential commercial/beneficial uses for the equipment, infrastructure and land to be decommissioned.				
	4.	Conduct Groundwater and Soil Quality Assessments for all processing areas.				
	5.	Consider best remediation practice for contaminated areas, including on-site land-farming and, where necessary, removal of contaminated soil from site for treatment or for safe disposal elsewhere.				
	6.	Identify and assess any potential environmental and societal risks associated with the preferred method of decommissioning.				
	7.	Address potentially significant environmental and societal risks by amending the proposed method of decommissioning to prevent any significant adverse impacts.				
	8.	Prepare a detailed Decommissioning Plan, laying out the: <ul style="list-style-type: none"> <li>• Decommissioning objectives;</li> <li>• Decommissioning procedures;</li> <li>• Environmental and social implications of decommissioning;</li> <li>• Implementation strategy, including stakeholder engagement;</li> <li>• Waste management, including opportunities to reuse or recycle material.</li> </ul>				
<b>Plant cleaning</b>	9.	Notify relevant authorities and stakeholders before decommissioning activities commence.	<ul style="list-style-type: none"> <li>• IOR/EOR Program Manager</li> <li>• Steam Injection Services Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• Before decommissioning activities start</li> </ul>	<ul style="list-style-type: none"> <li>• Review notifications sent</li> </ul>	<ul style="list-style-type: none"> <li>• Number of stakeholders notified</li> </ul>
	10.	Remove all remaining water, sludge, oil etc from plant and infrastructure.		<ul style="list-style-type: none"> <li>• At the start of</li> </ul>	<ul style="list-style-type: none"> <li>• Regular review of</li> </ul>	<ul style="list-style-type: none"> <li>• Condition of</li> </ul>

Decommissioning Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods	Performance Indicators
	11.	Clean all equipment before disconnecting or removing it.		decommissioning	progress • Review disposal procedures	equipment • Incidents of contamination • Cost of clean up
	12.	Remove all old equipment.				
	13.	Ensure that substances, for example process water, sludge, oil and grease etc. are properly disposed of and not discharged to canals.				
	14.	Ensure that water (or any other substance used to clean plant and infrastructure) is treated and tested for hydrocarbons before being discharged or disposed of.				
<b>Well abandonment</b>	15.	Plug wells in accordance with Staatsolie’s General Plug & Abandon Requirement to prevent leaks of fluids and methane to the surface and of oil, gas or salty water into freshwater aquifers.	• IOR/EOR Program Manager	• During decommissioning	• Review of proposed methods • (Independent) inspection of activities	• Compliance with Staatsolie’s General Plug & Abandon Requirement
<b>Rehabilitation</b>	16.	Rehabilitate areas as required in terms of the agreement with the land owner, intended future land use and the decommissioning plan.	• IOR/EOR Program Manager	• After decommissioning	• Visual inspection of rehabilitation areas, if any	• Success of rehabilitation
	17.	Notify relevant authorities and key stakeholders when decommissioning and rehabilitation are completed.			• Proof of notification	
<b>General</b>	18.	Provide adjacent landowners with contact details to register any observations and complaints following decommissioning.	• Staatsolie CCU	• Before end of decommissioning	• Proof of notification	
	19.	Clarify issues of residual liability before relinquishment.				

### **3.1.5 General Environmental Management Measures**

This section lists general, typically routine environmental management measures applicable to all phases of the project. Responsibility of implementation will depend on the project phase and component and will be allocated by the HSEQ Upstream Manager.

#### **3.1.5.1 Hazardous Materials**

- Place fuel and hazardous material storage tanks / containers on an impermeable surface and within an appropriate bund (at least 110% of the largest tank) from which any spills / leaks can be collected and pumped into a backup tank. Install a roof if possible to prevent stormwater contamination from these areas.
- Construct chemical storage compounds outside of floodplains and further than 100 m from the normal high-water mark of a water body or a water supply borehole.
- Develop (or adapt and implement) procedures for the safe transport, handling and storage of potential pollutants.
- Avoid unnecessary use and transport of hazardous substances.
- Keep Material Safety Data Sheets (MSDS) for all hazardous materials on site and ensure that they are available for reference by staff responsible for handling and storage of materials.

#### **3.1.5.2 Repair and Maintenance**

- Implement maintenance and inspection procedures.
- Regularly perform maintenance of all plant, equipment and infrastructure in line with manufacturer's and Staatsolie's specification.
- Maintain infrastructure and equipment such as tanks, pipelines, valves and fittings in good working order to prevent leaks and minimise evaporation of oil.
- Maintain vehicles in good working order to minimise atmospheric emissions.
- Regularly inspect all equipment, infrastructure (including pipelines) and holding tanks for leaks or damages.
- Repair any defects as soon as possible. In the case of leaks, ensure that the leaking water or effluent is captured and not released to surface water.

#### **3.1.5.3 Stormwater Management**

- Install clean and dirty stormwater management systems.
- Capture stormwater that might be contaminated separately and route to a settling pond where suspended matter can settle out. Dispose of such matter appropriately, e.g. to an approved landfill, and not into the environment.
- Keep outdoor areas clean to minimise the potential of polluting stormwater.
- Collect stormwater from bunded areas and treat or separate waste before disposing into surrounding drainage system.
- Use berms and stormwater drainage systems to prevent surface run-off from entering site excavations.
- Implement measures to maximise the infiltration of stormwater on site.

#### **3.1.5.4 Noise and Emissions Management**

- Maintain all generators, vehicles and other equipment in good working order to minimise exhaust fumes and excess noise.
- Enclose diesel generators used to supply on site power to reduce excess noise, if necessary.

#### **3.1.5.5 Dust Management**

- Limit vegetation clearance and the construction footprint to what is essential.
- Stabilise exposed surfaces as soon as practically possible.
- Minimise dust generated on gravel sections of the Gangaram Pandayweg by:
  - Dampening dust-generating sections of the road;
  - Adhering to speed limits; and
  - Responding to complaints.
- Limit vehicle speeds to 40 km/h on unconsolidated and non-vegetated areas.
- Cover trucks transporting loose material to or from site with tarpaulins, plastic or canvas if necessary, to avoid dust.
- Reduce airborne dust at construction sites through dampening dust-generating areas, roads and stockpiles with water if required.
- Regularly evaluate the effectiveness of all dust management measures. Amend how or which measures are used if necessary.

#### **3.1.5.6 Concrete/Cement Work**

- Use pre-mixed concrete rather than batching on-site where possible.
- Ensure that no cement truck delivery chutes are cleaned on site. Cleaning operations are to take place off site at a location where wastewater can be disposed of in the correct manner. If this is not possible a suitable washing facility is to be developed on site.
- Batch cement in a bunded area within the boundaries of the development footprint only (where unavoidable).
- Ensure that cement is mixed on mortar boards and not directly on the ground (where unavoidable).
- Physically remove any remains of concrete, either solid, or liquid, immediately and dispose of as waste.
- Place cement bags in bins and dispose of bags as waste to a licensed waste disposal facility.
- Sweep / rake / stack excess aggregate / stone chip / gravel / pavers into piles and dispose at a licensed waste disposal facility.

#### **3.1.5.7 Fire Management**

- Ensure that no fires are permitted on or adjacent to site except in areas designated for this purpose. Any such designated areas should be situated as far as possible from flammable material stores and any other high fire risk, or environmentally sensitive areas.

- Ensure that no smoking is permitted on the site except within designated areas.
- Ensure that sufficient fire-fighting equipment is available on site.
- Equip all fuel stores and waste storage areas with fire extinguishers.
- Ensure that all personnel on site are aware of the location of firefighting equipment on the site and how the equipment is operated.
- Suitably maintain firefighting equipment.

#### **3.1.5.8 Traffic Management**

- Manage activities so as to minimise impacts on road traffic as far as possible, e.g.:
  - Attempt to arrange delivery of materials when it will least disrupt traffic; and
  - Stagger deliveries rather than concentrating them during “rush” hours.
- Ensure that all safety measures are observed and that drivers comply with the rules of the road.
- Ensure that vehicle axle loads do not exceed the technical design capacity of roads utilised by the project.
- Ensure that trucks transporting large equipment or hazardous material are clearly marked and accompanied by safety vehicles.
- Investigate and respond to complaints about traffic.
- Inform nearby residents and businesses in a timely manner of delivery schedules;
- Avoid deliveries at night;
- Publicise delivery schedules on social media;
- Monitor trucks at strategic points along the Gangaram Pandayweg to determine compliance with traffic rules agreed upon between Staatsolie and contractor; and
- Intensify the dust suppression programme on the Gangaram Pandayweg during construction, especially the section from the beginning of the Gangaram Pandayweg (Km 0) to the entrance to the Tambaredjo Oilfield (Km 6).

#### **3.1.5.9 Transportation and Refueling**

- Undertake regular maintenance of vehicles and machinery to identify and repair minor leaks and prevent equipment failures.
- Undertake any on-site refuelling and maintenance of vehicles/machinery in designated areas. Line these areas with an impermeable surface and install oil traps.
- Use appropriately sized drip trays for all refuelling and/or repairs done on machinery – ensure these are strategically placed to capture any spillage of fuel, oil, etc.
- Clean up any spills immediately, through containment and removal of free product and appropriate disposal of contaminated soils
- Keep spill containment and clean-up equipment at all work sites and for all polluting materials used at the site.

### ***3.1.5.10 Employment***

- Consider maximising the employment of local workers.
- Work closely with local institutions to identify and communicate required skills and resources that the nationals could provide.
- Consider purchasing resources from Surinamese sources wherever feasible.

### ***3.1.5.11 Environmental Awareness Training***

- Provide environmental awareness training to all personnel on site at the start of their employment. Training should include discussion of:
  - Potential impact of activities on the environment;
  - Suitable disposal of waste and litter;
  - Spill prevention measures;
  - Response to an environmental incident;
  - Key measures in the EMMP relevant to worker's activities; and
  - How incidents and suggestions for improvement can be reported.
- Ensure that all attendees remain for the duration of the training and on completion sign an attendance register that clearly indicates participants' names.

### ***3.1.5.12 Complaints and Grievances***

- Continue to publicise and implement the existing Staatsolie grievance mechanism.
- Inform landowners potentially affected by a spill.

## **3.1.6 Response to Environmental Pollution**

This section lists key measures that must be taken in response to environmental pollution during any phases of the project. Responsibility of implementation will depend on the project phase and component and will be allocated by the HSEQ Upstream Manager.

- Maintain a list of external equipment, personnel, facilities, funding, expert knowledge and materials that may be required to respond to emergencies. The list should include personnel with specialised expertise for spill clean-up, flood control and water treatment.
- Immediately stop the activity causing pollution in the event of environmental pollution (e.g. spillage).
- Contain the spill at source or as close to source as possible to prevent spread of liquid.
- Cease injection of steam in the event of an unforeseen temperature increase in an offset well.
- Monitor groundwater quality at the water abstraction point (1J22) and possibly at new sentinel wells in the event of a leak.
- Resume activity only once the pollution has been halted or (in the case of spillages) contained without reaching the environment.
- Repair faulty equipment as soon as possible.

- Install additional bunding / containment structures around the equipment that was the source of the leak / spillage to prevent pollution.
- Treat hydrocarbon spills, e.g. during refuelling, with adequate absorbent material, which then needs to be disposed of at a suitable landfill.
- Notify NIMOS of a significant environmental pollution event as soon as possible, latest within 24 hours.

### **3.2 MONITORING FRAMEWORK**

The key focus of the monitoring program will be the impacts from the various project activities on the environment at representative sites and at any sites where problems have arisen or are suspected. This will provide information on the accuracy of the impact predictions that were made and on the effectiveness of the EMMP. It will also provide important input information for any future development activities in similar areas.

The primary variables to be addressed in the monitoring program are groundwater level and quality and surface water quality. The monitoring framework program is presented in Table 3-5. Based on this framework the HSEQ Upstream Manager must set up a documented sampling program and allocate responsibilities.

Monitoring results should be provided to NIMOS biannually while monitoring takes place.

**Table 3-5: Monitoring framework programme for the CSS Project**

Aspect	Parameters	Frequency	Monitoring locations	Reference values
Groundwater Quality	<ul style="list-style-type: none"> <li>- pH</li> <li>- EC</li> <li>- Alkalinity</li> <li>- Selected metals, based on available produced water and background water sampling data, but as a minimum As, Se and Ba</li> </ul>	Quarterly	<ul style="list-style-type: none"> <li>- Existing boreholes 1J22, 30HW25 and 3Z14 to groundwater layer at ~490 ft bgl</li> <li>- One monitoring well into deeper brackish aquifer at ~790 ft bgl</li> </ul>	Compare results to baseline measurements taken before initiation of CSS project
Groundwater temperature	- °F or °C	Quarterly	<ul style="list-style-type: none"> <li>- Existing boreholes 1J22, 30HW25 and 3Z14 to groundwater layer at ~490 ft bgl</li> <li>- One monitoring well into deeper brackish aquifer at ~790 ft bgl</li> <li>- Tijerkreek</li> </ul>	Compare results to baseline measurements taken before first steam injection
Surface water quality	<ul style="list-style-type: none"> <li>- pH</li> <li>- EC</li> <li>- Dissolved oxygen</li> <li>- Chemical oxygen demand</li> <li>- Oil and grease</li> <li>- Selected metals: initially analyse for a comprehensive suite of metals and select parameters for future monitoring based on those results.</li> </ul>	Quarterly	<p>Upstream of the discharge point(s) in the Saramacca River, beyond the reach of the tidal push from discharge point, for baseline value</p> <p>Downstream of the discharge point(s) in the Saramacca River, ~at the western boundary of the Tambaredjo Oilfield</p>	Compare results to baseline measurements taken before initiation of CSS project
Effluent	Monitored as part of discharge from existing operations.	Twice per week	After treatment, prior to discharge	Comply with the relevant IFC guidelines for effluent discharge
Oil reservoir temperature	- °F or °C	Continuous during CSS cycles	Surrounding offset producers	Compare results to baseline measurements taken before first steam injection

# Appendices

## **Appendix A: Method Statement**

**METHOD STATEMENT**

**SOM DEPARTMENT:**..... **DATE:**.....

**PROPOSED ACTIVITY** (give title of Method Statement and reference to Environmental specification):

**WHAT WORK IS TO BE UNDERTAKEN** (give a brief description of the works):

**WHERE ARE THE WORKS TO BE UNDERTAKEN** (where possible, provide an annotated plan and a full description of the extent of the works):

**START AND END DATE OF WORKS FOR WHICH METHOD STATEMENT IS REQUIRED:**

Start Date:

End Date:

**HOW ARE THE WORKS TO BE UNDERTAKEN** (provide as much detail as possible, including annotated maps and plans where possible):

In case on private land: include signature of owner/user to show that he/she is aware

*Please attach extra pages if more space is required*

## **Appendix B: EMMP Checklist**

## Weekly Site Checklist

*To be submitted to the HSEQ Upstream Division*

*Location:*

Mitigation measure	Yes/No	Comments
All personnel on site are aware of the contents of the EMMP and were made aware of environmental issues.		
All personnel on site are aware of the ERPs		
All personnel on site are aware of the drugs and alcohol policy		
MSDS's are available for all hazardous substances on site.		
Hazardous materials storage area is uncompromised and the hazardous materials register is current and visible.		
Fuel is stored in a bunded area (with 110% of the stored fuel volume) and no leaks are visible.		
Refuelling of vehicles occurs within the designated refuelling area, with adequate pollution prevention measures in place.		
Drip trays are being used where there is a risk of spillage (i.e. fuelling of equipment).		
All containers and storage tanks are leak proof.		
There are no spills and leakages.		
Concrete is not being batched on soil.		
Spill response equipment and materials is functional and accessible.		
No animal kills have been reported.		
Waste is separated and collected in appropriate bins/areas and removed to a suitable landfill regularly.		
Firefighting equipment is functional and accessible.		
Vehicles are roadworthy and in good working order.		

Mitigation measure	Yes/No	Comments
Deliveries are scheduled during low-traffic hours.		
Erosion control measures are in place and are effective in controlling erosion.		
Dust suppression is implemented if dust is generated.		
There is no trespassing by project personnel.		
There is no trespassing by unauthorized persons.		
There is adequate provision of toilets and toilets are satisfactorily maintained.		
There are no complaints from the community.		
Areas where construction is complete have been cleared and rehabilitated.		
Any other observations or comments.		

**Department delegate**

Completed by:

.....

Date: .....

Sign: .....

**Environmental Engineer**

Received and checked by:

.....

Date: .....

Sign: .....

## **Appendix C: Weekly Waste Report**

**Contractor's name** :  
**Project** :  
**Location** :  
**Period** :  
**Reported by** :

Waste type	Quantity	Unit: m <sup>3</sup> / kg / bbl	Disposal destination
Paper / cardboard			
Plastic bottles			
Rubber gloves			
Glass			
Food waste			
Wooden pallets			
Metal			
Drilling waste			
Water treatment waste			
Cement			
Package			
Coating cans			
Batteries			
Expired Chemicals			
Contaminated soil			
Oil wastes / lubricants			
Other:			

## **Appendix D: Overeenkomst inzake mijnbouwwerkzaamheden**



## **Artikel 2**

Staatsolie zal Gerechtigde vergoeden de schade onmiddellijk veroorzaakt door de bovengenoemde werkzaamheden. Deze vergoeding is, afhankelijk van het geval, gebaseerd op taxatie van LVV of andersoortige uit te voeren taxaties, en zal indien van toepassing in een nadere overeenkomst vastgelegd worden.

## **Artikel 3**

Partijen zullen indien nodig tijdens de uitvoering van de werkzaamheden met elkaar in overleg treden voor nadere afspraken met betrekking tot de uitvoering van bovengenoemde werkzaamheden

## **Artikel 4**

Visuele oriëntatie van de staat van bovengenoemd perceelland vóór de aanvang van de werkzaamheden heeft het navolgende doen constateren:

- 
- 
- 

## **Artikel 5**

Staatsolie zal ten behoeve van de mijnbouwwerkzaamheden de volgende aanpassingen plegen op bovengenoemd perceelland:

- 
- 
- 

## **Artikel 6**

Deze overeenkomst is van kracht jegens Gerechtigde, zijn rechtsverkrijgers en rechtsoptvolgers. Gerechtigde is gehouden bij de verkoop en overdracht in eigendom van het geheel of een gedeelte van het in de considerans omschreven perceel, alsmede bij verlening daarop van enig zakelijk genotsrecht, aan de nieuwe eigenaar of zakelijk gerechtigde ten behoeve van Staatsolie, alle de in deze overeenkomst opgenomen verplichtingen, over te dragen.

**Artikel 7**

Staatsolie is gehouden om conform het door het Nationaal Instituut voor Milieu en Ontwikkeling in Suriname (NIMOS) goedgekeurde Environmental Management Plan bij beëindiging van de mijnbouwwerkzaamheden het perceelland te rehabiliteren, zulks in overleg met Gerechtigde.

**Artikel 8**

Na het verrichten van de mijnbouwwerkzaamheden door Staatsolie zal het perceel als volgt worden overgedragen:

- 
- 
- 

Aldus overeengekomen en in tweevoud opgemaakt en ondertekend te Paramaribo op  
.....

Staatsolie Maatschappij Suriname N.V.

Gerechtigde

---

**R. Elias**  
**Managing Director**

## **Appendix E: List of applicable GFIs**

GFI no	Subject	Scope
<b>Section 1 ADMINISTRATIVE</b>		
<b>104N</b>	<b>Security Rules for Saramacca Operations</b> Dutch	This instruction outlines the security rules and regulations applicable to the Saramacca Operations for the different groups concerned.
<b>105(N)</b>	<b>Routine Safety Talks.</b> English/Dutch	This instruction formalizes the dissemination of information through regular meetings, approximately ten minutes long, commonly called "Toolbox Meetings" or "Safety Talks".
<b>106</b>	<b>HSE and Security Induction for New Arrivals.</b> English	This instruction describes the management of the system that controls HSE and Security Induction through which every new arrival is made familiar with the company's health, safety, environmental and security requirements as they relate to the activity that they are about to undertake.
<b>109(N)</b>	<b>Code of dress for industrial areas.</b> English/Dutch	This General Field Instruction outlines the type of clothing and minimum personal protective equipment (PPE) for the Employees and visitors present at Staatsolie industrial workplaces.
<b>110</b>	<b>Incident Reporting.</b> English	This instruction details the process for the reporting of incidents, which initiate the investigation of these incidents. Incidents are reported and recorded for, Mitigating of consequences; Preventing recurrence; Monitoring performance; Satisfying statutory requirements and for Insurance claims.
<b>119C</b>	<b>Personal Protective Equipment and Dress Code.</b> English/Dutch	This GFI identifies the most common types of personal protective equipment for the various locations on the Saramacca Field.

GFI no	Subject	Scope
120C	<b>General traffic rules.</b> English/Dutch	This GFI defines the general traffic rules to guide the performance of company Employees, contractor's Employees and visitors while on company roads. It also defines rules for the behavior of drivers of company owned and rented vehicles on public roads.
126	<b>Safe Use of Mobile Communication Devices.</b> English	This instruction provides guidance to the safe use of mobile Communication Devices in order to minimize hazards that are introduced with it.
130(N)	<b>Formatting of Work instructions.</b> English/Dutch	This GFI guides the process of selecting activities for which Work Instructions must be written and the formatting of the instructions.
131	<b>Guidelines for Departmental HSE Teams.</b> English	This GFI outlines the terms of reference and composition of the Departmental HSE Teams which are intended to assist the departmental head in the execution of the departmental HSE program and to achieve workers participation.
132	<b>Contractor Health, Safety and Environmental Management</b> English	This GFI provides guidance to Staatsolie staff in promoting and managing HSE performance of Contractors.
<b>Section 2</b> <b>JOB SAFETY INSTRUCTIONS</b>		
200(N)	<b>Permit to work system - General.</b> English/Dutch	This GFI provide guidelines to the process of “the Permit to Work system” that is in force at the Saramacca Operations, so designed:

GFI no	Subject	Scope
		<p>That one central authority knows all activities that are intended to take place at any location and,</p> <p>To ensure that adequate precaution is taken and that the condition of the equipment on which the work was done is safe for returning it to service.</p>
201(N)	<p><b>Permit to work system - Hot work.</b> English/Dutch</p>	<p>This GFI covers the aspect of the Permit to Work System that deals with the permitting of Hot Work.</p>
202(N)	<p><b>Permit to work system - Confined space entry.</b> English/Dutch</p>	<p>This GFI covers the aspect of the Permit to Work that covers the special precautions that must be taken to protect workers, required to enter vessels and other confined spaces, from the risks associated with this type of work.</p>
203(N)	<p><b>Permit to work system - Excavation.</b> English/Dutch</p>	<p>The Excavation Certificate controls the special precautions that must be taken when excavating is requested.</p>
210(N)	<p><b>Handling of Hazardous Chemicals.</b> English/Dutch</p>	<p>This instruction describes the management system for the selection, handling and disposal of all hazardous chemicals used by Staatsolie.</p>
214(N)	<p><b>Isolation, Lockout and Warning Tags.</b> English/Dutch</p>	<p>This procedure establishes guidelines to prevent personal injury and property damage due to an unexpected release of energy or hazardous materials.</p>
215	<p><b>Management of Change Procedure</b> English</p>	<p>This General Field Instruction provides guidelines in how to manage division cross-bordering changes at the Saramacca Operations that might create safety hazards for others than the originating division of the intended change.</p>

GFI no	Subject	Scope
225(N)	<b>Storage, Transportation and handling of Compressed, liquefied and pressurized gasses.</b> English/Dutch	This GFI handles the general guidelines for safe storage, transportation and the handling of gas bottles. The most common industrial gasses, which are used by Staatsolie, are oxygen, acetylene, nitrogen, propane (LPG), butane and carbon dioxide.
228(N)	<b>Abrasive Blasting.</b> English/Dutch	This instruction provides guidelines for the protection of personnel engaged in abrasive blasting and others who may be in the surrounding areas where abrasive blasting is conducted.
229(N)	<b>Spray painting.</b> English/Dutch	This instruction provides guidance for the safe use of spray painting whereby care must be taken to protect the workers involved, other personnel in the vicinity, nearby equipment and the environment.
230	<b>Housekeeping</b> English	This document provides guidance to Employee's to ensure that proper housekeeping is maintained.
232	<b>Job Safety Analysis</b> English	Job Safety Analysis is a proven method that evaluates a sequence of job steps or tasks to identify and document potential hazards and to take countermeasures to protect workers' health and safety against those hazards. This instruction provides guidance for conducting a Job Safety Analysis.
233	<b>Safety Color Codes</b>	This instruction establishes the requirements for a uniform visual system for marking potential hazards, and provides an effective means of communicating hazard information to the Employees & contractors, in order to reduce the likelihood of injury from potential hazards in the work environment. It defines the color codes of signs, tags and barricades to be used in controlling exposure to potential hazards, and specifies requirements for design uniformity to promote Employee recognition and avoidance of

GFI no	Subject	Scope
		hazards.
<b>Section 3</b> <b>EMERGENCY RESPONSE</b>		
305(N)	<b>Emergency Response - Injury / Illness.</b> English/Dutch	This instruction describes the procedure that needs to be followed when an emergency situation at the Staatsolie Saramacca Location turns up.
<b>Section 4</b> <b>EQUIPMENT STANDARDS AND SPECIFICATIONS</b>		
400	<b>Inspection of Fire Protection and Emergency Equipment.</b> English	This GFI provides departments and divisions of the Saramacca Operations with procedures for the inspection of Fire protection and Emergency Equipment, which must be in good condition at all time.
405	<b>Scaffolding Rules</b> English	This GFI provides the guidelines of erecting tubular scaffolding.
408(N)	<b>Protection from lead in lead-based paints.</b> English/Dutch	This instruction is intended to curtail the use of and provide protection when there is a possibility of exposure to lead-based paint.
410(N)	<b>Care of Gas Detection Instruments.</b> English/Dutch	This instruction provides guidelines for care of gas detection instruments.

GFI no	Subject	Scope
<b>Section 6</b> <b>ENVIRONMENT PROTECTION</b>		
611(N)	<b>Solid waste handling and disposal.</b> English/Dutch	This instruction provides guidance for solid waste handling and disposal requirements for waste listed in the appendix of this field instruction.
612	<b>Handling and Disposal of spent dry cell batteries and used toner cartridges.</b> English	This instruction provides guidance for the reduction and the disposal of spent dry cell batteries and toner cartridges in an effective and responsible manner. This is a way to manage waste, generated in oil exploration, production and refining related activities and processes, properly in order to minimize its potential to cause harm to health and the environment and to minimize the risk of potential liabilities.

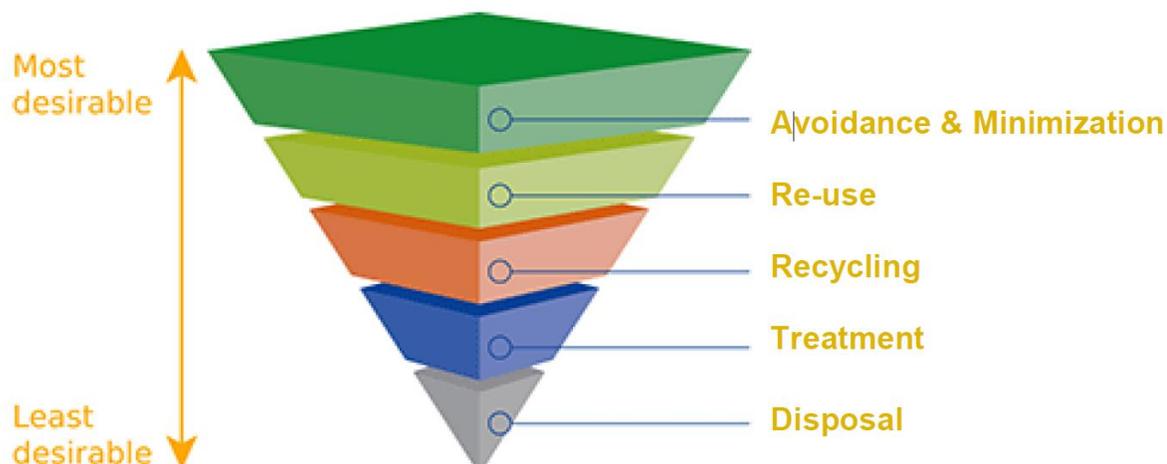
## **Appendix F: Project Waste Management Plan**

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## 1.0 Introduction

In order to manage the waste generated during the CSS project, this Waste Management Plan has been prepared. All employees, including Staatsolie and contractors, shall manage waste through implementation of the waste hierarchy, where avoidance and minimization of waste are the most preferred.



**Figure I-1: Waste Management Hierarchy**

## 2.0 Scope

This waste management plan applies to the activities carried out for the CSS project in the Tambaredjo Oilfield, during construction as well as the operational phase.

## 3.0 Terms and Definitions

Waste Generator	The department/employee carrying out the activity, which results in the material becoming surplus and being designated for discarding.
Hazardous waste	Any wastes, which because of its quantity, physical, chemical or infectious characteristics have the potential to cause harm to human health or the environment.
Waste Avoidance and minimization	Waste avoidance and minimization are at the top of the waste hierarchy. Avoidance is mostly preferred in the list of waste hierarchy where zero waste is generated. Slight modifications in activities can improve efficiencies in utilizing to reduce waste generation e.g. reducing paper waste by printing double sided.
Reuse	The action or practice of using something again, whether for its original purpose (conventional reuse) or to fulfill a different function (creative reuse or repurposing).
Recycling	Involves processing used waste materials into new products.
Treatment	Waste treatment refers to the activities required to ensure that waste has the least practicable impact on the environment.

Disposal	Wastes that cannot be reused, recycled or treated will be segregated and stored in designated waste storage areas for incineration, disposal in a landfill or for collection by a waste transporter.
Landfill	Site for the disposal of waste materials by burial.

#### 4.0 Responsibilities

Functionary	Responsibility
Employees/Departments Staatsolie (Waste Generator)	<ul style="list-style-type: none"> <li>• Ensure that practices are conducted to avoid unnecessary waste generation by prevention, minimization and reuse of waste.</li> <li>• Separate reusable, recyclable and other waste by placing them in therefore labeled waste bins.</li> <li>• Remove all waste from the construction and operation areas.</li> </ul>
Managers Upstream Operations, contractors	<ul style="list-style-type: none"> <li>• Implementation of mitigation measures as provided in chapter 3 of the EMMP.</li> </ul>
HSEQ Upstream Manager	<ul style="list-style-type: none"> <li>• Advice on the management of waste that are not covered by this plan.</li> <li>• Manage and analyze waste data and provide advice on improvements of waste management within the company.</li> <li>• Monitor and report on the implementation of this plan.</li> </ul>

#### 5.0 Waste management

##### 5.1 Waste segregation

All waste must be placed in designated areas for removal and treatment / disposal. To effectively implement the waste management hierarchy, segregation of waste streams at the source is essential into the following waste streams:

- Recyclables
- Hazardous materials
- Rubble / construction waste
- General waste

Appropriate and clearly labeled waste bins / skips have to be provided at strategic locations. Store hazardous / polluting waste on impermeable ground until it is disposed of / collected.

Prevent littering by staff by providing awareness training and enforcing the Waste Management Plan.

##### 5.2 Waste collection, transport, storage and handling

The waste will be stored temporarily on site and then collected and transported to the waste handling facilities of Staatsolie, including the Sarah Maria dumpsite and the land farm. At the

time of publication of this report, an ESIA for the new landfill and incinerator has been completed and detailed design is in progress. CSS project waste will be considered for disposal at those facilities once available.

### 5.3 Waste Management (disposal/treatment)

Waste types and management thereof are laid out below. The list of service providers needs to be updated as required

Do not allow any burning or burying of waste on site other than at designated and approved areas and in a supervised and safe manner.

Category	Waste type	Management	Responsible
Domestic / office waste	Paper/cardboard	Incineration / Recycling <sup>4</sup>	SOM
	Toner cartridges (possibly)	Recycling	SOM
	Plastic bottles	Recycling	AMRECO
	Rubber gloves	Incineration	SOM
	Glass	Reuse / Landfill	SOM
	Food waste	Incineration <sup>5</sup>	SOM
Industrial waste	Wooden pallets / packaging	Reuse / incineration / disposal to landfill	SOM
	Drilling waste	Mudpit	SOM
	Chemical wastes for water treatment	Treatment/ export	SOM
	Water treatment residues (muddy water, salt water)	Treatment as required to comply with discharge standards, to be confirmed once a supplier and water treatment system have been selected	Contractor
	Lubricant and motor oil	Storage in portafeeds at the Landfarm. Staatsolie plans to construct a treatment system (centrifuge and decanter) to treat the oil at the landfarm.	Contractor
	Spares replaced	Recycling	COBO
	Oil impregnated gloves	Incineration / Other treatment	SOM
	Oily waters from machinery (leaks)	Captured in drip trays and transported to oil-water separator	Contractor
	Steam generation waste water (condensate water)	Treatment as required to comply with discharge standards, to be confirmed once a supplier and water treatment system have been selected	Contractor
	Glassware (contaminated)	Incineration/landfill disposal	SOM
Lab chemical wastes	Treatment	SOM/Bux	

<sup>4</sup> Paper separation will be implemented in the last quarter of 2019.

<sup>5</sup> Options to reuse food waste, e.g. as animal feed, are being investigated.

Category	Waste type	Management	Responsible
	(solutions and reagents)		Engineering
	Batteries	Recycling	BAP
	Expired Chemicals	Incineration or Export	SOM
	Contaminated soil	Landfarm	SOM
	Oil waste	Oil is currently stored in a holding basin and treatment pond at the Landfarm of Staatsolie. Staatsolie also plans to construct a treatment system (centrifuge + decanter) to treat the oil at the Landfarm.	SOM
Other	Sewage waste (portable toilets)	Collected and disposed in septic tank	Uitzendbureau Sarah Maria

#### 5.4 Waste reduction

Identify measures to reduce waste on an ongoing basis, e.g.:

- Discourage the use of single use packaging
- Recycle packaging
- Deliver bulk material in re-usable containers rather than bags
- Use pre-mixed concrete rather than batching on-site where possible

#### 6.0 Monitoring

The implementation and effectiveness of the Waste Management Plan must be monitored, e.g. through the following methods:

- Identify and record an inventory of all waste streams for the CSS project, e.g. by completing the Weekly Waste Report (Appendix C) and capturing the information in a central database.
- Obtain, file and review waste disposal slips for waste removed from contractors.
- Visually inspect the sites to identify any non-conformances in waste management.
- Audit waste service providers annually to ensure they appropriately manage the waste and are licensed, if required.
- Record waste management practices that are in contravention of the EMPr as environmental incidents.

## **Appendix G: Handling of oil spills and leakage**

### ***1.0 Introduction and scope***

Oil / hydrocarbon spills can occur due to human error, equipment failures and circumventing maintenance procedures.

This plan is applicable for the CSS Project and is based on the existing procedures and plans of Staatsolie with regards to oil spill preparedness and response.

### ***2.0 Prevention of oil spills***

Prevention of spills has a lot to do with operational procedures. Following the maintenance procedures and operations protocols ensures a safe operation. The latter aids in the goal to prevent occurrence of oil spills within the implementation process of the company's HSEQ policy and core values.

### ***3.0 Minimize impact on the environment***

In order to minimize the impact on the environment, in case of an oil spill, the following measures will be implemented:

- Daily monitoring by operators.
- Markings and signs will be placed to indicate the locations of the pipelines. Guards will be placed for the protection of the manifolds.
- Maintenance activities as required.

### ***4.0 Response***

In case of an accidental spill or leak, the response will be as follows:

- Notification
  - Notify relevant parties (in accordance with the "Meldingsprocedure" – Figure J-1).
- Containment activities
  - Place sorbents for later removal.
- Reclaiming and clean-up activities
  - Recover contaminated soil.
  - Transport contaminated soil to the Landfarm facility of Staatsolie, for treatment.
- Monitoring
  - n/a.

**MELDINGSPROCEDURE**  
**Staatsolie Oil Spill Response Team**  
**t.b.v.**  
**Upstream**

<b>1. Indien U melding krijgt van een oil spill, handel dan als volgt:</b> Vraag de melder naar: <ul style="list-style-type: none"> <li>- Locatie en omvang van de olievlek</li> <li>- Naam, adres en telefoonnummer van de melder in geval van een buitenstaander</li> <li>- Naam en afdeling in geval van een Staatsolie employee</li> <li>- Overige bijzonderheden zoals: eventuele schade of persoonlijke ongelukken, de richting waar de olie naartoe gaat en of de spill toeneemt</li> </ul>			
<b>2. Indien het een spill betreft op Saramacca, bel of meld de Head Guard van Saramacca en geef de informatie door:</b> Head Guard: <ul style="list-style-type: none"> <li>- Internelijn: 444#</li> <li>- Buitenlijn: 375222 tst 444#</li> </ul>			
<b>3. De Head Guard meldt vervolgens de desbetreffende afdeling en vraagt voor verificatie van de informatie:</b> <ul style="list-style-type: none"> <li>- Gedurende werktijd, via het kantoor van de desbetreffende afdeling</li> <li>- Na werktijd en in het weekend, de desbetreffende afdelings standby operator (zie lopende roosters)</li> </ul>	<b>OPERATIONELE AFDELINGEN</b>		
	<b>Locatie</b>	<b>Telefoon Kantoor</b>	
	CS	68847, 63217, 63217	
	JS	67870, 67871, 67874, 67877	
	SM & LP	65840, 65846	
	CT TA-58	65870, 65873, 65876	
	FP TA-58/45	65840, 65844, 65843	
Calcutta/ Huwz	68840, 68844, 68856, 68857		
TNW	68848, 68849, 68872, 68873		
<b>4. Na verificatie wordt in geval van:</b> <ul style="list-style-type: none"> <li>- Een kleine spill, deze door de operationele afdeling direct aangepakt  <b>Actie: Afdelingsleiding of Shift Foreman</b></li> <li>- Een grote spill in openbaar water of op de openbare weg, door een Strike Team lid, of de afdelingsleiding aan de Guard gevraagd om het SORT lid conform het wacht dienstrooster te melden. Bij geen response van dit lid, moet steeds het volgend SORT-lid op het wacht dienstrooster worden gebeld.  <b>Actie: SORT leden</b></li> </ul>	<b>SORT-LEDEN</b>		
	<b>Functionaris</b>	<b>Telefoon Kantoor</b>	<b>Thuis</b>
	P. Brunings	66502	08515353
	H. Chin A Lien	66480	08583122
	R. Parran	68844	08923766
	S. Gopal	65843	0374072 / 08683973
	A. Schuitemaker	66850	431974 / 08660070
	S. Cheuk A Lam	65873	400275 / 08749000
	D. Riedewald	65840	08814953
	C. Monsels	65220	08727224
S. Oedit	66553	08854311	
A. Entingh	68847	328998 / 08591345	
S. Mangalsing	66714	08710554	
<b>5. Indien het een spill betreft op TLF of bij de pipeline TLF-Paranam wordt de Guard van TLF door de Head Guard van Saramacca hiervan op de hoogte gebracht.</b> Head Guard TLF: - Telefoon: 480501 tst 62235 - Telefoon: 486294 tst 62235			

Figure J-1