Annex F

Waste Management Requirements and Plans

CONTENTS

F1 INTRODUCTION

F1.1 BACKGROUND

As part of Tullow's commitments to achieve high environmental standards, a Waste Management Plan (WMP) covering the Jubilee Phase 1 project activities has been developed. To ensure effective management of generated wastes, a waste policy is in place to encourage prevention and reduction in waste generation and conformance with the waste hierarchy of recycling, treating and managed disposal of residues.

Where possible, wastes will be processed and disposed of directly by Tullow. Wastes generated by service contractors working directly for Tullow will be required to likewise implement a waste minimisation policy and to responsibly handle their own waste streams.

F1.2 PURPOSE AND SCOPE

The construction, operation and decommissioning of the project will result in the generation of a range of waste streams that have the potential to impact on the human health and the wider environment. The WMP is aimed at identifying the waste-related management procedures to reduce risk and mitigate potential impacts.

This document details the methods to be adopted by Tullow for the management of hazardous and non-hazardous solid and liquid wastes generated during the course of the Operations both offshore and onshore. This plan covers the operations of the following facilities and sites:

Offshore

- FPSO Vessel
- MODU (Eirik Raude and Blackford Dolphin)
- Supply Vessels

Onshore

- Shore Bases at Takoradi and Accra

The WMP covers collection, storage, treatment offshore, transport to shore, onshore treatment and disposal, and data management.

The control of air emissions and discharges to water are covered in other project documents, prepared as part of the project Environmental Management Plan.

Cascading down from this document will be Waste Handling Procedures (WHP) for each operation producing waste. These will be site-specific procedures detailing exactly how waste is to be handled. The WHPs will identify approved Waste Contractors.

F1.3 OBJECTIVES

The objectives of the WMP are as follows.

- Recognise the waste management hierarchy and treat wastes as close to its source of generation where practicable.
- Ensure compliance with the Ghanaian environmental and waste legislative and regulatory requirements.
- Comply with International Finance Corporation (IFC) Performance Standards and Guidelines and Equator Principles.
- Identify the sources of waste associated with the construction, commissioning and operation of the Jubilee Field Phase 1 development (both offshore and onshore).
- Classify generated streams into non-hazardous and hazardous wastes.
- Describe management measures to minimise waste-related impacts associated with all activities, services and facilities at all project sites.
- Assign responsibilities for implementing the WMP and describe verification and monitoring measures.

F2 REGULATIONS AND INTERNATIONAL STANDARDS

F2.1 STATUTORY REGULATIONS

General waste management in Ghana is the responsibility of the Ministry of Local Government and Rural Development, which supervises the decentralised Metropolitan, Municipal and District Assemblies (MMDAs). However, regulatory authority is vested in the Environmental Protection Agency (EPA) under the auspices of the Ministry of Environment and Science.

The EPA is responsible for the environmental and operational permitting of waste management facilities; this includes treatment and final disposal facilities. All waste carriers and treatment facilities should hold the appropriate licences or permits from the EPA or be on approved supplier lists. The MMDAs are responsible for the collection and final disposal of solid waste through their Waste Management Departments and their Environmental Health and Sanitation Departments.

The legislation guiding the management of hazardous, solid and radioactive waste is spread amongst a range of Acts and policies, including the Local Government Act 462 (1994), the Environmental Protection Agency Act 490 (1994), the Pesticides Control and Management Act 528 (1996), the Environmental Assessment Regulations LI 1652 (1999) the Environmental Sanitation Policy of Ghana (1999), the Guidelines for the Development and Management of Landfills in Ghana, and the Guidelines for Bio-medical Waste (2000).

F2.2 WASTE RELATED INTERNATIONAL CONVENTIONS

F2.2.1 MARPOL Convention

Ghana is a signatory to the MARPOL Convention (Marine Pollution Convention), although not all parts are ratified yet, and as such is expected to have facilities for the reception of 'MARPOL wastes' which include oily wastes and refuse (and sewage when this part is ratified). Ghana currently has limited facilities capable of managing MARPOL wastes although Takoradi port has access to a facility for oily wastes.

F2.2.2 Basel Convention

The Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention) aims to protect human health and the environment against the adverse effects resulting from the generation, management, movement and disposal of hazardous waste.

Ghana gained accession to the Basel Convention on 30 May 2003 (accession has the same legal effect as ratification) which means that it must comply with all the requirements of the Convention. Therefore, certain wastes generated in Ghana, or within its territorial waters, that are exported to another country, will be subject to the provisions of the Basel Convention.

The Convention obliges producers of hazardous waste to therefore dispose of their waste in an environmentally responsible manner close to where it is generated. Strong controls on the movement, storage, transport, treatment, reuse, recycling, recovery and final disposal of hazardous waste are imposed. The Convention regulates the transboundary movement of hazardous waste using the Prior Informed Consent Procedure such that shipments without prior consent are illegal.

Transboundary movements would generally be approved, if:

(a) the state of export does not have the capability of managing or disposing of the waste in an environmentally sound manner, such as may be the case in Ghana, or
(b) the receiving state has appropriate, environmentally sound facilities, and agrees to accept the waste.

F2.2.3 Bamako Convention

Ghana is a signatory to the *1991 Convention on the Ban of the Import into Africa and the Control of Transboundary Movement of Hazardous Wastes within Africa (Bamako Convention).* This convention is supplementary to the Basel Convention and covers movement of hazardous waste into or between signatory African countries. The Convention has many provisions virtually identical, or analogous, to the Basel Convention provisions.

F3 EXISTING WASTE MANAGEMENT INFRASTRUCTURE

This section describes the current waste management issues and options in Ghana. The existing facilities have been taken into account in the development of the WMP.

F3.1.1 Waste Collection and Transportation

There are a number of companies in Ghana collecting and transporting domestic-type solid wastes using a large number of collection vehicles ranging from tricycles to 40m^3 container trucks and compacting waste collection trucks There is limited capacity for collection and transportation of liquid and hazardous wastes.

F3.1.2 General Solid Waste Management

Waste management treatment and disposal infrastructure is currently underdeveloped. These facilities are principally intended for the collection and management of general solid wastes from domestic sources, however, general solid wastes from commercial and industrial sources are also disposed of at these facilities, although the Planning Manual specifies that this is acceptable only provided that they have been 'previously identified and quantified by the Assembly for handling'.

The majority of municipal dumps have no environmental protection measures and therefore are unsuitable disposal sites for hazardous or potentially hazardous wastes. A sanitary, lined, landfill funded by the World Bank was built for Sekondi-Takoradi (with 10 cells and enough capacity for approximately 15 years of waste arisings). The project ceased and the partially developed landfill at Takoradi remains a potential resource when the project is reactivated. There is currently uncontrolled tipping at the site. In the short term this site is the only landfill which is available for solid wastes in the Takoradi area.

F3.1.3 Industrial and Hazardous Waste Management

There are no dedicated facilities for industrial solid waste management or hazardous waste management other than an oil water separation facility as described below. Industrial solid wastes in the region are generally disposed of to municipal dumps with or without any form of pre-treatment. There is also believed to be widespread illegal dumping.

There is an established procedure for generators of hazardous industrial wastes to inform the EPA (Chemicals Department) who will advise on sampling and analysis of the waste and then advise any necessary treatment and/or disposal procedures to be followed. This may include the supervision of the actual disposal of wastes by EPA staff. From discussions with local

waste management operators it appears that a great many generators of hazardous wastes are bypassing this system and dumping their hazardous wastes in an uncontrolled manner.

F3.1.4 MARPOL Waste Management Facilities

There are a number of contractors in Ghana offering collection and disposal services for MARPOL Annex 1 wastes (oily and oil/water wastes). The majority of these technologies are very basic, comprising simple gravity separation, with no specific technologies to assist separation and no use of chemical surfactants. At Takoradi some oily wastes are taken to Takoradi Power Station to utilise spare capacity of the power station's oil/water treatment system. This system features a three stage separation system – gravity separation basin, API(1) separator and a Dissolved Air Flotation (DAF) separator.

Refuse and sewage wastes are dealt with via the Metropolitan Assembly's normal routes for such wastes with refuse going to the existing waste dump. There are no facilities available for the management of chemical wastes in bulk or packaged form.

F3.2 RECYCLING FACILITIES

Basic facilities exist for plastics, glass and metals recycling so there is scope for segregation of general solid waste at source for introduction into the local recycling markets.

There are small collectors of waste oils. These oils are however not re-refined and are generally utilised as supplementary fuels in heating applications. Some of these uses are considered acceptable by EPA but many of the other common uses, such as the practice of using oily sludges as wood preservatives, are unacceptable to the EPA and can not be regarded as being appropriate from a health and safety perspective.

There are no known facilities in country for recycling of dry cell batteries or fluorescent lamps. There is *ad hoc* recycling of lead-acid batteries locally however the method of recycling and the treatment/final disposal method and destination of the acids is unclear. More recently a lead-acid recycling company has established itself in Tema.

(1) The API separator is a proprietary device commonly used in the oil and gas industry to separate oil and water based on their different specific gravities

F3.3 WASTE TREATMENT AND PROCESSING

There are no known facilities in Ghana for physical/chemical treatment of industrial wastes and no known facilities for thermal treatment of hazardous wastes.

With regard to healthcare wastes, it is understood that some hospitals have combustors for healthcare wastes but that none of these currently meet European Union Waste Incineration Directive standards.

The Takoradi Power Station has a small liquid/sludge incinerator for residues from its oil/water separation system and on-site tank cleaning operations. It is understood however that this incinerator has never been fully commissioned and has remained unused.

Cement kilns are now commonly used to dispose of certain hazardous wastes in many countries with higher energy content wastes being used as supplementary fuels in the kilns. Although there is cement production in Ghana the cement is produced from imported clinker and there are no cement kilns in Ghana. Thus, this potential waste management route is not available.

F3.4 EXPERIENCE AND CAPABILITIES OF WASTE MANAGEMENT CONTRACTORS

Waste management contractors are emerging in Ghana with improving experience. These are largely limited to collection and transportation companies serving Metropolitan areas. There are also a number of MARPOL waste collection contractors, all of whom are relatively small, relatively recently established organisations with limited capacity. From discussions with the companies evaluated for the purposes of this assessment, these facilities typically have just gravity separation in storage tanks and no wastewater treatment capabilities to process separated water. Some companies are investigating establishing integrated waste management facilities to deal with MARPOL Annex I oily wastes, inorganic wastes, chemical treatment, hazardous waste incineration and physical treatment systems including washing, shredding and container crushing.

F4 WASTE MANAGEMENT STRATEGY

F4.1 WASTE HIERARCHY

All wastes arising from Operations and other activities will be managed to ensure protection of the environment and human health. Waste management activities will be performed in accordance with the following waste hierarchy principles.

- **Reduce** - the quantity of waste generated by prevention of arising by process or design change. Eliminate wastes by improved management of products.
- **Re-use** - materials where possible in engineering structures or return to suppliers where surplus to requirements.
- **Recycle –** material streams where practicable (eg oils, metal, wood, paper, plastics) to reduce the quantity of wastes landfilled.
- **Recover** - as much as possible, such as oils from contaminated cuttings or energy within materials.
- **Responsible disposal –** to landfill or alternative following appropriate treatments to reduce hazards and long term impacts on the environment.

Waste minimisation and the application of these principles shall be addressed in the Contracts and Procurement Execution Strategies for the project and taken into consideration when reviewing shipping, storage and disposal method throughout the project life span.

F4.2 TULLOW WASTE STRATEGY REQUIREMENTS

Tullow's Waste Strategy requires the following.

- Facilities will develop and implement forward-looking WMPs, ensuring that maximum effort is given to waste prevention, reduction, reuse and recycling.
- The EHS Team will set annual performance targets that sites will be expected to meet as a minimum.
- The performance of each asset will be assessed on a regular basis along with other environmental Key Performance Indicators (KPIs) (preferably on a quarterly basis) by the Tullow Management Team of each facility.
- Each site will maintain an inventory of waste streams by type, tonnage and their fate, to ensure cradle-to-grave tracking for each site. Such data

will be in a consistent format across the facilities and offices, and include data on reuse items (eg waste oil reprocessing; wood reuse) and quantities of specific material streams recycled (eg metal, paper and card, plastics).

- No waste is to be discharged overboard offshore, unless under permitted authorisation from the EPA.

- Priority should be given to the management of wastes at source or as close to source as practicable. Waste management solutions should be identified on a local, regional, national, and then international level, only where appropriate technologies cannot be identified in-country.

- Sites will purchase products in a manner that minimises waste arisings and their consequential environmental impact.

- Sites will carry out internal audits, monitoring and spot checks on procedures, working practices and facilities, to ensure compliance with legislation and the WMP.

- All sites will ensure that an annual duty of care audit is completed on each of their waste contractors.

F5 WASTE DEFINITION, IDENTIFICATION AND CLASSIFICATION

F5.1 WASTE DEFINITION

For all wastes, both hazardous and non-hazardous, a risk assessment will be carried out by the facility that generates the waste with assistance from the EHS Advisor. The risk assessment will classify each waste type for inclusion on facility specific Waste Inventories and provide appropriate handling guidance, including any additional Personal Protective Equipment requirements for inclusion in Waste Handling Plans (WHPs).

The EHS Advisor would be consulted in the event that new waste streams are identified to ensure that all relevant risks are assessed and appropriate storage and disposal options are provided. The risk classification will be included in any relevant waste documentation. Any unidentified wastes will be quarantined and investigated until accurately classified and an appropriate disposal option is identified.

F5.2 NON-HAZARDOUS WASTE

Wastes that do not exhibit any hazardous properties are classified as non-hazardous. These may be inert or potentially biodegradable. Categories of non-hazardous waste or inert waste are further classified according to their source. These include the following categories.

- **Domestic Waste**. This category includes kitchen waste from the offshore galleys/canteens, offices, operational and residential accommodation and locations, as well as refuse from general maintenance activities such as cleaning, cooking and gardening.

- **Industrial Waste.** This is defined as any non-hazardous operational waste. It includes: scrap metal, construction waste (concrete, bricks etc.), wooden pallets, plastics and cardboard packaging. It excludes materials contaminated with hazardous chemicals such as oil. It can also include some categories of drilling fluid components and drill cuttings and some wastes from offices.

- **Commercial Waste.** This includes items such as used stationary, plastics, packaging materials, printer cartridges and toner for copying machines.

A list of example non-hazardous wastes is included in *Table F5.1*. Each site or facility will keep a Waste Inventory detailing what non-hazardous wastes are generated.

Table F5.1 Example Non-hazardous Wastes

Category	Example Types	Potential Sources				
		FPSO	MODU	Vessel	Shore Base	Offices
Concrete and rubble	Blocks from construction				✓	
Food	Organic waste, food etc.	✓	✓	✓	✓	
Glass	Bottles and jars etc	✓	✓	✓	✓	✓
Metal cans & tins	Drink and food cans	✓	✓	✓	✓	✓
Metal drums (cleaned)	Uncontaminated drums	✓	✓	✓	✓	
Metal, ferrous	Steel, gratings, sheet steel, iron beams, tubulars and casings etc	✓	✓	✓	✓	
Metal, non-ferrous	aluminium	✓	✓	✓	✓	
Paper and card	Printer paper, newspapers, magazines	✓	✓	✓	✓	✓
Plastic bottles	Drinks bottles	✓	✓	✓	✓	✓
Plastic drums (cleaned)	Empty plastic drums	✓	✓	✓	✓	
Residual domestic waste	Mixed waste from staff accommodation and bins	✓	✓	✓	✓	
Textiles	Unwanted clothes, uncontaminated	✓	✓	✓	✓	✓
Wood	Pallet, crate, beam, general packaging,	✓	✓	✓	✓	✓

F5.3 HAZARDOUS WASTE

Each Tullow site or facility will keep a Waste Inventory detailing what hazardous wastes are generated. Key example hazardous waste streams from offshore oil exploration and production are detailed in *Table F5.2.*

Hazardous wastes are materials that can potentially be harmful to human health and/or could potentially damage the natural environment if not managed and disposed of appropriately. Hazardous wastes are those that exhibit one or more of the characteristics such as highly flammable, toxic or corrosive etc, a full list of potential hazards is included in *Table F5.3.*

Table F5.2 Example Hazardous Wastes

Category	Example Types	Potential Sources				
		FPSO	MODU	Vessel	Shore Base	Offices
Acids/Alkali	Cleaning or workover acids	✓	✓	✓		
Adhesives & pipe coatings		✓	✓	✓	✓	✓
Aerosols	Spray cans	✓	✓	✓	✓	
Asbestos	If any identified				✓	✓
Batteries (large lead acid)	Vehicle batteries	✓	✓	✓	✓	
Chemical mixture	Anti-scalents,	✓	✓	✓	✓	
Clinical/Medical waste	needles, bandages, blood, medicines, etc	✓	✓	✓	✓	
Contaminated Catalysts		✓	✓	✓	✓	
Fluorescent tube/bulbs		✓	✓	✓	✓	✓
Glycol liquid/filters		✓				
Oil based mud	Low toxicity OBM		✓			
Oil filters and liquids		✓	✓	✓	✓	
Oily solid waste	rags, filter, gloves, etc	✓	✓	✓	✓	
Oily water (slop)		✓	✓	✓	✓	
Paints	Paint and thinner (liquid)	✓	✓	✓	✓	✓
Radioactive waste	NORM	✓	✓		✓	
Solvents, halogenated		✓	✓	✓	✓	
Solvents, non-halogenated		✓	✓	✓	✓	
Spill absorbents	Oil contaminated pads	✓	✓	✓	✓	
Tank bottom sludges		✓	✓	✓	✓	

Table F5.3 Hazard Properties of Wastes

Code	Hazard	Description of Hazard
H1	Explosive	Substances and preparations which may explode under the effect of flame or which are more sensitive to shocks or friction than dinitrobenzene.
H2	Oxidising	Substances and preparations which exhibit highly exothermic reactions when in contact with other substances, particularly flammable substances.
H3A	Highly Flammable	- liquid substances and preparations having a flashpoint of below 21°C (including extremely flammable liquids), or - substances and preparations which may become hot and finally catch fire in contact with air at ambient temperature without any application of energy, or - solid substances and preparations which may readily catch fire after brief contact with a source of ignition and which continue to burn or to be consumed after removal of the source of ignition, or - gaseous substances and preparations which are flammable in air at normal pressure, or - substances and preparations which, in contact with water or damp air, evolve highly flammable gases in dangerous quantities'
H3B	Flammable	Liquid substances and preparations having a flashpoint equal to or greater than 21°C and less than or equal to 55°C.
H4	Irritant	Non-corrosive substances and preparations which, through immediate, prolonged or repeated contact with the skin or mucous membrane, can cause inflammation.
H5	Harmful	Substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may involve limited health risks.
H6	Toxic	Substances and preparations (including very toxic substances and preparations) which, if they are inhaled or ingested or if they penetrate the skin, may involve serious, acute or chronic health risks and even death.
H7	Carcinogenic	Substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce cancer or increase its incidence.
H8	Corrosive	Substances and preparations which may destroy living tissue on contact.
H9	Infectious	Substances containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in man or other living organisms.
H10	Toxic for reproduction	Substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may produce or increase the incidence of non-heritable adverse effects in the progeny and/or of male or female reproductive functions or capacity.
H11	Mutagenic	Substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce hereditary genetic defects or increase their incidence.
H12		Substances and preparations which release toxic or very toxic gases in contact with water, air or an acid.
H13		Substances and preparations capable by any means, after disposal, of yielding another substance, e.g. a leachate, which possesses any of the characteristics listed above.
H14	Ecotoxic	Substances and preparations which present or may present immediate or delayed risks for one or more sectors of the environment.

Source: European Union, Hazardous Waste Directive, Annex III.

F6 WASTE MANAGEMENT PROCEDURES

F6.1 THE DUTY OF CARE SYSTEM

Tullow recognises that it has a responsibility to ensure that any waste it produces is handled safely and in accordance with legal requirements. This means that Tullow will implement appropriate measures so that waste is stored and disposed of responsibly and in particular will undertake the following.

- Prevent anyone keeping, depositing, disposing or removing Tullow waste without a waste management license ensuring that waste is only handled or dealt with by approved individuals or businesses.
- Ensure that waste management licenses are kept current.
- Ensure materials are properly packaged for transportation and that all waste containers are appropriately labelled for storage and transportation purposes.
- Ensure records are kept (for a minimum of 2 years), of all wastes received or transferred, through a system of signed Waste Transfer Notes (WTN). This will provide a written description that will enable anyone receiving the materials to dispose of it or handle it in accordance with their own Duty of Care.
- That regulators are provided with regular waste management reports.
- Ensure Material Safety Data Sheets (MSDS) records are kept for all hazardous wastes and accompany the waste during transportation.

F6.2 WASTE STORAGE AND SEGREGATION

Storage areas will be provided for waste containers at each facility. Hazardous and non-hazardous wastes will be segregated in separate storage units in designated areas. These areas are to be indicated on the facility site plan. Wastes must be stored in a manner to prevent:

- accidental spillage or leakage;
- contamination of soils and groundwater;
- corrosion or wear of containers;
- loss of integrity from accidental collisions or weathering;
- theft by people; and
- scavenging by animals.

Waste storage containers will be appropriate in terms of volume, composition, and shape and access for the material that is being stored. Only containers in good condition will be utilised. Bungs and lids will be securely fastened or other forms of covering shall be provided. Storage of waste will be carried out in accordance with the MSDS, in a designated area, with a suitable surface and a method to contain any leakage or contaminated runoff water. Containers used shall be inert in relation to their content, clearly labelled, indicating the characteristics of the content, date of containerising or packing, and data on toxicity and/or potential contaminant.

All hazardous wastes that cannot be treated in Ghana will be stored at the planned Tullow Hazardous Waste Store at Takoradi Shore Base. A range of waste types, including waste electrical and electronic equipment (WEEE) and bulbs, will be stored until export in accordance with relevant Ghanaian regulations and international conventions.

This facility will be constructed on concrete hard standing with fully contained surface water drainage to prevent surface and groundwater contamination. It will also be located within a secure fenced area topped with razor wire for security and a detailed inventory will be kept of all stored materials. These wastes will be exported in a timely manner following all international export procedures.

F6.3 CONTAINER SUITABILITY AND LABELLING

Prior to allowing the consignment of waste to leave an operational site, the facility specific Designated Personnel shall ensure that the waste containers are:

- clearly labelled - to describe the contents using the appropriate waste labels which should be completed in full (old labels should be removed to avoid confusion)
- in good condition and are not leaking
- appropriate to the waste they contain
- appropriately sealed (eg with a lid or bung)
- not emitting any harmful gases or generating heat

See *Table F6.1* below for colour coding at Takoradi Base.

Table F6.1 Tullow Waste Management Colour Coding

Colour	Description
Blue	General waste
Red	Hazardous waste
Green	Wood
Black	Scrap metal
Yellow	Spill kit

If any of these have not been done or have been done to a poor standard, the waste consignment should not be allowed to leave the facility. The EHS Advisor or designated personnel should be contacted who will take all necessary corrective action(s) to rectify the situation before allowing the waste to leave the facility.

Any unidentified waste should be quarantined at site in the designated area. The wastes should be reviewed following Tullow procedures, adhering to additional Personal Protective Equipment (PPE) requirements. Classification of the waste may require sampling and testing to confirm presence or otherwise of hazardous components.

F6.4 WASTE TRANSFER NOTES

WTNs are fundamental to ensuring that wastes are transferred from the producer, through transportation chain to the disposer and provide a record of due diligence and duty of care. The WTN tracks the waste stream from the point of origin to the deposit location. WTNs will accompany all waste consignments (along with cargo manifest) originating from relevant operational sites, and will be duly completed with the details required within the WTNs and the appropriate signatories.

F6.5 WASTE MONITORING, INSPECTION AND REPORTING

All onshore and offshore facilities producing wastes are required to keep a Waste Register and an inspection and reporting plan. The frequency and type of inspection will be agreed by all parties with the inspection covering all waste generating activities through segregation, handling, storage and final disposal.

The designated personnel will maintain the Waste Register and copies of all WTNs that have been produced from the site. The Waste Register will be available at all sites filed in printed form. The Waste Register shall contain a record of all waste arisings and serve as an index for all WTN consignments. The Waste Register will include, as a minimum, the following information:

- waste inventory;
- source of waste (eg rig, vessel, base);
- description (eg oily rags);
- classification of waste streams (ie hazardous or non-hazardous);
- quantity (weight in kg/tonnes or volume in litres/m^3);
- treatment or disposal method;
- numbered WTNs, duly signed and dated; and
- copies of completed WTNs returned to the Takoradi EHS Advisor.

All reports should be fed back from the Waste Contractor to the EHS Advisor who will review the information and provide feedback to Tullow Management.

F6.6 WASTE CONTRACTOR: WASTE COLLECTION AND TRANSFER

F6.6.1 Waste Collection

The Waste Contractor will collect Tullow generated wastes from the Takoradi Port or Tullow operated facilities using appropriate vehicles. Tullow will advise the Contractor at least 24 hours in advance of the expected time that the wastes need to be collected from the port, bases or other facility and the Contractor shall collect the wastes within 2 hours of the specified time.

All skips used to transfer Tullow generated wastes will be supplied and regularly compliance checked by Tullow staff. The Contractor will be provided with an adequate supply of nets for use with the skips which must be used when transporting all loads.

F6.6.2 Collection Vehicles

The Contractor will collect Tullow wastes using waste collection vehicles that, as a minimum, comply with Tullow's vehicle policy. All vehicles in the Contractor's fleet will:

- have regular maintenance checks and servicing, fully documented and logged;
- load skips automatically (within twelve months of first oil) to minimise manual handling of waste;
- have road legal tyres exceeding minimum tread requirements; and
- comply with all Ghanaian vehicle laws and Tullow minimum vehicle standards.

All staff operating the vehicles will wear appropriate PPE as a minimum:

- when loading materials, including coveralls, high visibility vests, steel toe-capped boots and hard hats;
- when loading / transferring liquid wastes goggles or face visor should be worn; and
- when loading / transferring hazardous liquids a chemical splash suit should be worn.

Procedures will be put in place so that waste is delivered to the appropriate storage or treatment facility during operating hours on the same day as collected, and should not be stored in any vehicle overnight (unless this is at one of the Contractor's waste management facilities within a secure and bunded area).

All collected loads will be properly labelled. Any hazardous wastes will be appropriately labelled and accompanied by relevant MSDS. The Contractor shall ensure that the wastes remain appropriately labelled during transportation and that any relevant MSDS sheets are carried with the load during transportation.

The Contractor will ensure that vehicle drivers/operators are adequately trained in vehicle operation and the handling of Tullow wastes. Training records shall be maintained to demonstrate that all drivers are suitably qualified and trained. In the case of waste collected by barge from vessels by the Contractor, the barge must meet with Tullow approval with regard to design and condition.

During transfer from vessel to barge, Tullow procedures with regard to oil spill prevention shall be implemented. Similar oil spill prevention procedures must be implemented for the transfer of wastes from the barge to shore. Vehicles containing bulk liquid Tullow wastes must not be left parked pending transfer to the treatment facility unless the parking area is bunded and capable of retaining a spillage of at least 110% of the tanker volume.

F6.6.3 Waste Transfer

All collected wastes will be delivered to the respective Waste Contractor's treatment facility without undue delay and in no case later than the end of the working day on which the waste was collected.

No vehicles containing waste originating from Tullow may be parked and left unattended other than at one of the Contractor's own facilities within an appropriately constructed and designated area capable of ensuring the security of the load and capable of preventing any leakage or spillage being released into the environment.

Vehicles may be parked temporarily only for the purposes of making additional collections of waste with the vehicle but only for long enough to facilitate any such collections.

No Tullow waste will be transported in the same vehicle as incompatible wastes or materials unless the wastes and/or materials are packaged in such a way as to prevent the wastes / materials coming into contact with each other.

F6.6.4 Waste Reception

On arrival at the facility all wastes will be weighed or quantified by other means. The Contractor will provide Tullow with copies of the WTN to confirm the receipt of the consignments.

F7 RESPONSIBILITIES FOR WASTE MANAGEMENT

F7.1 TULLOW EHS RESPONSIBILITIES

The EHS Team will have the following responsibilities.

- Provide advice, assistance and support to all facilities on the implementation of waste policy and strategy and formulation of WMPs, WHPs, Waste Registers and promotion of awareness among staff and contractors.
- Provide a focal point and co-ordinate the progress towards the aim of elimination of waste from all facilities.
- Review progress of waste management at a regional level and, where required, co-ordinate regional reduction, reuse, recycling schemes and targets.
- Provide the focal point for external waste management contractors to ensure consistency of approach and data handling.
- Track the performance of waste handlers and ensure that all onshore waste management facilities and waste contractors are audited at least once a year. Service companies and contractors will also be audited.
- Provide guidance to facilities on legislative and technical developments and monitor developments and innovations in the waste management industry.
- Provide advice and assistance to contracts/procurement regarding the purchase of products which can be reused or recycled and in the requirements of contracted waste management services.

F7.2 RESPONSIBILITY FOR WASTE MANAGEMENT

The EHS Manager is responsible for the overall preparation and implementation of this plan. The EHS Manager will be supported by the Tullow Ghana Ltd EHS team, FPSO Offshore Installation Manager, Takoradi Logistic Base Manager and Facilities Manager. Responsibilities, as detailed in *Table F7.1*, include the following.

- Arranging the disposal of both offshore-generated wastes and those originating from the Shore Base and offices in accordance with the WMP standards.
- Organising sufficient, suitable waste containers to allow effective waste segregation at the FPSO, MODUs, Shore Base, offices and other facilities.
- Arranging for the collection of the wastes and transfer via vessel to shore, for the reception of waste at the port and for ensuring that wastes are disposed of to appropriate waste handling contractors. Designated personnel are identified in all facility specific procedures for waste management.
-

Table F7.1 EHS Regional Responsibility for Waste Management

Takoradi Position	Area/Responsibility
EHS Manager	***Overall Responsibility for Waste Management*** • To ensure preparation & implementation of WMP & associated procedures
Tullow Ghana Ltd EHS team	***Waste Legislation & Classification*** • To ensure compliance with Ghanaian and any other relevant Legislative requirements. • To advise on whether wastes are hazardous or non-hazardous and on approved waste streams disposal routes. • Ensure information on new waste streams are assessed for risk assessment. • To investigate the suitability of new waste treatment/disposal facilities before use, and undertake periodic audits for verification.
FPSO Offshore Installation Manager Takoradi Logistic Base Manager Facilities Manager	***Waste segregation at source*** • Waste streams segregated on FPSO and drill rigs as per WMP • Waste return reporting and WTN • Ensure information on new waste streams are communiciated for risk assessment.
Logistics Base Manager Facilities Manager Tullow Ghana Ltd EHS team	***Waste Contracts*** • Will ensure that all waste transporters meet acceptable standard before use, and undertake periodic audits for verification. • Monitor contractor performance. • Investigating any breach of the WHP and close-out of non-compliance issues.
FPSO Offshore Installation Manager Takoradi Logistic Base Manager Facilities Manager	***Operational Delivery*** • Liaise with appointed persons responsible for coordinating waste at each facility. • Ensures appropriate waste containment units are available at all facilities. • Ensures wastes transferred to the port are disposed of in line with the performance standards set out in the WMP.
Tullow Ghana Ltd EHS team	***Training & External Communications*** • Ensuring all persons charged with waste management are fully trained to perform their duties. • Ensuring waste minimisation programmes are carried out on a regular basis. • Provide advice to offshore installations, onshore bases and third party vendors. • To communicate any changes in the WMP to Ghanaian authorities
FPSO Offshore Installation Manager Takoradi Logistic Base Manager Facilities Manager	***Data Management*** • Ensure that a register of waste is maintained for all wastes, originating offshore and at the Base. • Keep a log of waste movements for reporting purposes. • Keep a record of all WTN's from the Base and offshore for a minimum of two years. • Compiling waste data and MWRs on Tullow Operations and maintain a database of this information.
Tullow Ghana Ltd EHS team	***Performance Indicators*** • The collection, compilation and analysis of performance statistics to ensure compliance. • To drive and monitor improvements; and to report as required internally. • Submit waste disposal records and status reports as appropriate to Tullow Management, and Ghana authorities as required.

F7.3 MONITORING AND DOCUMENTATION

F7.3.1 Data Management

Takoradi EHS Advisor shall collate and record waste generated from Takoradi onshore (ie offices, accommodation, warehouses) and offshore installations. Accra Facilities EHS Advisor shall collate and record waste generated from Accra facilities. For their respective areas, they will compile Monthly Waste Reports.

The Tullow Ghana Ltd EHS team will review the Monthly Waste Reports (MWR) received. The purpose of this assessment is:

- to confirm the accuracy of reporting;
- to ensure the WMP is being implemented correctly and that standards are being met;
- to monitor waste arisings and specific streams to identify trends and priority areas of improvement; and
- to report to Tullow Management.

Records are required to be kept by each installation or facility (eg Waste Register including WTN copies). The offshore MWR sheets will be transmitted to EHS Advisor who shall verify the quantities, retain records and will produce key statistics for annual reporting.

F7.4 SERVICE CONTRACTORS

All Tullow contractors are responsible for the disposal of the wastes they generate in accordance with the terms of their contracts. They must be legally compliant (for their own and Tullow operations) and will progress towards full compliance with Tullow waste management requirements. They shall maintain their own waste management systems and identify dedicated personnel for waste management and supply copies of their WMPs.

F7.5 ALL PERSONNEL

All personnel (Tullow staff and Contractors) shall ensure that waste generated through our operations and activities are properly disposed of in accordance with the policies and procedures stated in this plan. Line managers are responsible for compliance with the applicable Ghanaian laws and regulations relating to waste management and for meeting and enforcing the adopted standards of Tullow as set out in this document.

F7.6 WMP REVIEW

The waste management system needs to adapt to relevant changes such as in the event of:

- changes to Ghanaian laws and regulations;
- changes in Tullow Corporate policies and reporting procedures;
- changes in Tullow's activities;
- identified deficiencies or improvement opportunities; and
- infrastructure developments.

The review will be taken at least annually by the Tullow Ghana Ltd EHS team.

F7.7 WASTE MANAGEMENT AUDITING

Audits and evaluations will be performed according to the EMS audit programme and include both in-house and external auditing. External audits will be commissioned on an annual basis by the EHS Department. Key outcomes from review and audit activities are tracked to ensure that waste minimisation opportunities are identified, to help establish goals and objectives, and to improve the management of all generated wastes.

Where weaknesses or non-conformance are identified, remedial action will undertaken by Tullow.

F8 WASTE RECYCLING, TREATMENT & DISPOSAL OPTIONS

F8.1 WASTE TREATMENT OPTIONS

Where waste generation cannot be avoided and the materials cannot be recycled they should be managed using the concept of Best Available Techniques (BAT). This is also sometimes referred to as Best Practicable Environmental Option (BPEO).

Although there are currently limited waste management options in Ghana, however this situation is likely to change in the medium term. Tullow will work with existing Ghanaian Waste Contractors to deliver appropriate standards to meet Tullow's waste policy requirements.

To maximise recovery of materials and to minimise long term liabilities, the treatment techniques detailed in ***Error! Reference source not found.*** will be delivered by the Waste Contractors.

Table F8.1 Typical Waste Segregation and Disposal Methods

Category	Type	State	Source/Description	Interim Management	Long-term Management Options
Non-hazardous	Glass	Solid	Bottles and jars etc	• Landfill • Return to supplier (e.g. drink bottles)	• Crush (to reduce volume) and send to landfill • Return to supplier (e.g. drink bottles) • Send to glass recycling facility
	Grease	Sludge	Used cooking oil and galley grease from oil separators	• Add microbes /enzymes to grease traps (source reduction) • Landfill	• Incineration • Waste to energy • Bio-diesel • Bioremediation (compost or land farm)
	Metals	Solid	Ferrous and non-ferrous, including drinks cans (steel and aluminium)	• Reclaim/re-use • Recycle	• Reclaim/re-use • Recycle
	Paper and card	Solid	Papers, magazines, office paper etc.	• Landfill	• Incinerate/waste to energy • Recycling • Landfill
	Plastic	Solid	Bottles and mixed plastics	• Landfill	• Incinerate/waste to energy • Recycling • Landfill
	Residual mixed waste	Solid	Domestic types, food from galley, packaging, bin waste etc	• Landfill	• Incinerate • Landfill • Recycle after materials separation
	Wood	Solid	Pallets, crates, furniture	• Recycle, re-use • Landfill	• Incinerate/waste to energy • Recycle, re-use • Landfill

Category	Type	State	Source/Description	Interim Management	Long-term Management Options
Hazardous	Batteries	Solid	Lead acid, lithium ion, etc	• Storage	• Recycle (eg Pagrik Ghana)
	Chemicals, various	Liquid	Solvents or contaminated chemicals	• Return to supplier • Re-use Inventory management to prevent expiry	• Incinerate (liquid incinerator)
	Medical/clinical	Solid	Swabs, dressings, old medicine etc	• Medical grade incinerator	• Medical grade incinerator
	Oil contaminated materials	Solid	Filters, oily rags	• Storage	• Incinerate/waste to energy
	Oil, used	Liquid	If cannot be mixed with crude export stream	• Treated in oily waste water treatment plant. • Sent to production stream on FPSO	• Treated in oily waste water treatment plant. • Sent to production oil on FPSO
	Tank bottom sludge	Sludge	Tank clean out and un-pumpable sludges	• Treated in oily waste water treatment plant.	• Treated in oily waste water treatment plant.
	Various types	Solid	Fluorescent tubes & bulbs, Glycol filters, paints, solvents, cleaners	• Storage of liquid wastes • Metals recycled	• Incinerate/waste to energy • Metals recycled
	Water, slops	Liquid	Oil contaminated etc	• Treated in oily waste water treatment plant.	• Treated in oily waste water treatment plant.

F8.2 NON-HAZARDOUS WASTE: SEGREGATION & TREATMENT

F8.2.1 Recycling & Reprocessing of Materials

All material streams that can be practicably recycled in Ghana should be segregated and transferred to the appropriate reprocessing facilities. In the short term these are likely to include the following:

- metals (ferrous and non-ferrous);
- wood;
- paper and card;
- plastics; and
- glass;

As additional capability and capacity is developed in Ghana, further material streams will be diverted, once facilities have been approved to receive the materials. To facilitate recycling the waste materials will be segregated at the Waste Contractors treatment facility and may undergo further physical or chemical treatment prior to transfer for reprocessing. The treatment of specific materials is discussed in more detail in the following sections.

If there is no practicable market for recycling of materials, in the short term they may be taken to landfill. In this eventuality they will be delivered in segregated form and offloaded away from mechanical machinery and not at the same location as the general solid waste for disposal so as to minimise the risk to people scavenging on site.

F8.3 PHYSICAL TREATMENT

Metal Cans

All metal drink and food cans will be segregated from the mixed wastes and crushed. The crushed metals will be stored in bulk containers (skips or containers) prior to transfer to an EPA and Tullow approved metal recycling facility. The Waste Contractor will report to Tullow the quantities of all metals that are recycled.

Scrap Metals

All scrap ferrous and non-ferrous metals and associated cables etc should be separately stored at the site. The metals will be transferred to an approved recycling facility and the quantity recycled reported to Tullow.

Wood

All uncontaminated wood that is segregated will be recovered/reclaimed at an EPA and Tullow approved facility. The Waste Contractor will report to Tullow the quantities of all wood that are recovered. Tullow will audit all companies receiving wood.

Paper and Card

Once recycling contractors are identified, packaging card and paper will be segregated and processed into bales. The bales will be stored in a dry location prior to transfer to an approved recycling facility. Tullow will be notified of the quantity of material removed and its final destination on a monthly basis.

A small amount of confidential paper waste will be shredded by Tullow and incinerated or disposed to landfill.

Plastic Bottles and Hard Plastics

Once recycling contractors are identified plastic drinks bottles will be sorted from the mixed wastes. Segregated plastics will be stored at the facility until sufficient quantities have been generated for transfer to an appropriate recycling facility approved by the EPA and Tullow. All quantities of transferred materials will be reported to Tullow on a monthly basis.

Glass

All glass bottles and containers will be segregated from the mixed general waste (all colours) and crushed. The crushed glass will be stored in secure containers prior to transfer to an appropriate recycling facility or for disposal. Tullow will be notified of the quantity of glass that is removed from the Contractor's site and the final destination of the material.

F8.4 INCINERATION

There is currently no high temperature incinerator available in Ghana to treat non-hazardous or hazardous wastes.

Tullow will investigate the potential for a small, multi-purpose, containerised incinerator to be used. If this is deemed viable, Tullow will work with a yet to be identified waste contractor to develop the basic infrastructure of the site to be able to commission and operate this incinerator as soon as practicable. This incinerator will be capable of processing mixed residual domestic type wastes and small quantities of hazardous waste.

The incinerator will be operated in accordance with the manufacturer's procedures and will be maintained in accordance with the manufacturers recommended maintenance schedule. All staff involved in operating the unit will be suitably qualified. The incinerator will be specified to meet any EPA permitting and emissions performance standards.

This incinerator will be used for residual domestic-type wastes, small quantities of spill kit/sludges, paint cans, clinical/medical waste and any other wastes appropriate for incineration that Tullow specify if they cannot be reused, recovered or recycled.

The bottom ash from the incinerator must be collected and stored on site. The ash will periodically be transferred to a suitable landfill disposal site, as agreed with Tullow and the EPA.

F8.5 HAZARDOUS WASTE TREATMENT

F8.5.1 Physical Treatment

A range of hazardous wastes will be treated by the Waste Contractor at a dedicated treatment facility. There will be a number of material specific treatments designed to reduce the hazardous nature of the material and where possible facilitate recycling (eg de-polluting drums).

Fluorescent Tubes and Bulbs

Tubes or bulbs containing potentially hazardous substances will be processed using a purpose designed Bulb Crushing Unit. The crusher will be operated according to the manufacturer's procedures. Residues will be collected and stored in a secure container or drum. Once the container is full of contaminated crushed glass it should be sealed and delivered back to the Tullow Hazardous Waste Store at the Takoradi Base where Tullow will manage the export process until an in-country processing facility is identified to treat the waste.

Lead Acid Batteries

Any identified waste treatment facility should have the necessary equipment and procedures in place to drain and neutralise acids from wet batteries.

Large vehicle batteries containing acid will be drained to remove corrosive electrolytes (see below). A procedure should be put in place to ensure all acid is drained from the batteries and collected in appropriate storage containers. Once drained the batteries should be rinsed out in a secure wash down area with a sufficient quantity of hot water to remove any minor residue and left to drain.

Once drained, the batteries can be manually stripped, allowing the segregation of plastics and the lead or sent directly to an EPA and Tullow approved battery recycling plant.

Neutralisation of Acids

All acids collected from the batteries will be stored in appropriate containers. A procedure should be put in place to undertake neutralisation of the acids on site using appropriate techniques (alkalis). This will include details of additional PPE requirements. No untreated acid should be allowed to be discharged to land or surface waters. Once neutralised, the liquid can be evaporated or discharged to the foul water collection system for treatment.

Contaminated Metal & Plastic Drums

The Waste Contractor will provide a service to ensure the de-pollution and destruction of metal and plastic drums. A procedure will be put in place to ensure the following steps are taken.

- On arrival at the Contractor's site, each consignment of drums will be quantified, detailing the number and type of each container, and reported to Tullow.

- Each drum will be washed out using a hot water pressure washer with drum wash spray head removing all liquid residues. The washing will be undertaken on a designated wash-down area with fully contained run-off and drainage, wash-water to be processed via wastewater treatment system.

- Drums will be allowed to drain completely on the wash-down area.

- Metal drums will be crushed in a mechanical Drum Crusher which pierces then flattens the drums. Once fully flattened the crushed drums can be transferred and stored with other metals ready for transfer to an approved recycling facility (with other metals).

- Plastic drums will be shredded using a mechanical shredder (also used for shredding tyres), crushed or cut so that they cannot be used for other purposes. Treated plastic drums can be stored with other hard plastics prior to transfer to approved recycling facility. Alternatively these shredded plastics can be landfilled.

F8.5.2 Incineration of Hazardous Waste

A range of hazardous wastes may, in the future, be incinerated in a containerised incinerator as described above. These materials can be incinerated along with non-hazardous wastes according to the incinerators operational procedures. Hazardous wastes that can be incinerated include:

- contaminated PPE and oily rags;
- small quantities of oily sludge;
- oil filters / process filters;
- paints (see below);
- clinical/medical waste (see below).

Paints

Unused paints that have dried out that are delivered to the facility can be incinerated. Partially full cans of solvent paints should have the tops of the cans removed to allow drying out prior to incineration. Metal tins can be recovered from the bottom ash and recycled if all paint residues have been destroyed.

Clinical/Medical Waste

The small quantities of clinical/medical wastes generated can be incinerated. Additional management procedures will be put in place to make sure all clinical wastes are stored and transported in appropriate containers, and the destruction of all loads is witnessed and confirmed by the facility manager. All consignments will have appropriate WTNs, the Waste Contractor will report all quantities destroyed to Tullow.

F8.5.3 Liquid Waste Reprocessing

Waste Oil, Contaminated Water and Oil Sludges

Waste oil and oil contaminated water will be treated by gravity separation followed by oil water separation / dissolved air flotation (DAF). This shall be undertaken at the Takoradi Power Station in the interim period until the Waste Contractor has their own equivalent facility from which time the wastes shall be processed at that facility. Separated waste waters will only be discharged in compliance with the effluent discharge limits set by the EPA at each facility.

F8.6 LANDFILL DISPOSAL

For non-hazardous wastes, an approved Waste Contractor will use the Takoradi landfill site that will be audited by Tullow.

F8.7 HAZARDOUS WASTE STORAGE

All hazardous wastes that cannot be treated in Ghana to an acceptable standard will be transferred to the Tullow Hazardous Waste Store at Takoradi Shore Base where it will be stored until it can be exported to appropriate treatment facilities in accordance with all relevant national regulations and international conventions (see *Section F2.2*).

F8.8 WASTE EXPORT

For the specialist treatment of wastes at international waste treatment facilities Tullow will develop Waste Management Export Plans (WMEP) for consignments of stored hazardous wastes that will meet international requirements for the transfer of the material for treatment or incineration out of the country. This will involve a number of stages, including:

- fully documenting the quantities and characteristics of the wastes;
- engaging with the appropriate Ministry to seek required export permits;
- identifying suitably qualified waste contractors that can treat the material and arranging contracts and confirmation that the country will allow import of the wastes; and
- repackaging materials ready for transfer.

F9 FPSO: WASTE MANAGEMENT PROCEDURES

F9.1 INTRODUCTION

This section sets out the FPSO-specific practices and controls that are in place to manage waste generation, segregation, collection, and transfer of waste in compliance with the requirements of Tullow management systems.

F9.2 IMPLEMENTATION OF PROCEDURES

Resources have been identified on the FPSO for waste management planning and implementation of this WMP. They are:

- designated personnel responsible for waste management on the FPSO;
- designated locations on the FPSO for the collection and segregation of wastes; and
- dedicated resources to provide waste awareness training to all personnel.

F9.2.1 Designated Personnel: FPSO

The personnel detailed in *Table F9.1* have designated roles and responsibilities for the off-shore management of FPSO generated wastes. They will be supported by designated shore based staff.

F9.3 COLLECTION, SEGREGATION AND STORAGE OF WASTES

This plan requires separate collection, storage, disposal and documentation for different classes of waste (see *Section F6*). Waste is collected according to the type and classification of the waste itself and segregated on the FPSO to:

- comply with current legislation;
- allow effective management at the port and onshore base;
- facilitate recovery of materials for recycling;
- ensure any incompatible wastes are kept apart; and
- comply with the EMS.

F9.3.1 Collection and Storage

Various types of containers and receptacles (total unit containers; netted skips, bins, drums etc) are provided for the collection, movement and storage of waste. Containers must be of suitable design to prevent leaks (eg from failure through corrosion), weathering and scavenging, and to facilitate safe transport.

For some segregated wastes, clear plastic bags will be used. This will assist waste handlers in identifying 'contaminated' segregated waste quickly and without risk of injury (eg oil contaminated rags).

Table F9.1 FPSO: Designated Personnel and Responsibilities

Position	Responsibility
FPSO Offshore Installation Manager (OIM)	• Overall responsibility for compliance with the WMP • Responsible for ensuring all personnel are aware of waste management procedures
Maintenance Co-ordinator	• Overall waste management and procedural compliance assurance
Deck Co-ordinator	• Ensures appropriate waste containment units are available • Segregates, labels and stores all waste according to procedures • Ensures appropriate information is available on types, quantities and packaging of waste from those generating the waste • Completes all necessary documentation for waste transfer (eg WTN, MSDS etc) and supplies data to EHS Advisor • Retains records of waste disposal for the statutory period
Deck Crew	• Assists in the movement of waste to collection points as required • Informs Deck Co-ordinator when waste containers require shipping • Monitors waste disposal practices on a daily basis and report non-compliances to Deck Co-ordinator
Laboratory Technician	• Provides assistance in the identification of waste as requested
Medical Officer	• Ensures clinical wastes are collected in the appropriate containers
EHS Officer	• Ensures all activities associated with the disposal of NORM are permitted by the EPA • Ensures quantities and quality (oil content) of all produced sand discharged to sea is approved and quantities reported
EHS Advisor (Onshore)	• Overall responsibility for the delivery and update of the WMP • Monitors waste management performance against targets and objectives • Provides additional guidance as required • Completes and submits Tullow monthly and annual waste reports
Contractors	• Comply with all relevant legislation, regulations and Tullow policies relating to waste management unless other arrangements are agreed in writing
All Personnel	• Minimise the production of waste • Ensure all wastes are managed in accordance with WMP and procedures

All collection containers must be labelled with the facility's name, waste type and approved mode of disposal. FPSO personnel take their waste to the various collection points around the vessel. If required, the deck crew will assist by using the appropriate crane and/or baskets, containers, etc.

The FPSO Locator Chart for Waste Collection Containers details the location and type of collection points on the vessel. These charts are displayed around the vessel to facilitate waste collection.

F9.3.2 Segregation

Waste will be segregated into (but not limited to) the following categories:

Hazardous Wastes

- Batteries (large lead acid)
- Chemicals
- Clinical waste
- Contaminated drums
- Fluorescent tubes and bulbs
- Oily hard waste such as filters, rags, PPE and used spill kits
- Oily sludge
- Cooking oil
- Paints
- WEEE

Non-hazardous Wastes

- Dry recyclable materials (eg metal, plastic, glass, paper and card)
- General mixed domestic type waste
- Wood

Colour coded signs are used to indicate containers for the storage of specific waste types as detailed in *Table F6.1*.

F9.3.3 Training

All personnel will receive waste management awareness as part of the FPSO induction process. Additional awareness training and information is communicated to personnel through toolbox talks, team briefings and safety meetings. Training material available on the FPSO includes:

- Waste management awareness videos
- Waste awareness PowerPoint training package

Where identified, further training for key personnel will be provided. Further guidance and information is available from the EHS Officer or onshore EHS Adviser on all waste issues.

F9.4 WASTES PROCESSED ON THE FPSO

F9.4.1 Food

Food waste from the galley will be macerated on the FPSO prior to discharge to sea. Organic food wastes generated will be macerated to pass through a 25 mm mesh and discharged with no floating solids or foam.

F9.4.2 Waste Oils and Fuel Samples

Waste Oils

Waste oil generated on the FPSO from operational activities involving machinery and plant lubrication will be collected in drums and fed into the production system via the closed drain system.

Aviation Fuel Samples

Waste aviation fuel from daily sampling will be collected in drums and periodically fed into the production system via the closed drain system.

F9.5 WASTE STORAGE & TRANSFER TO SHORE

F9.5.1 Waste Storage

With the exception of those wastes processed on the FPSO (see *Section F9*), all other waste will be back loaded and shipped to shore for treatment or disposal in accordance with these procedures.

The movement of waste from the FPSO to its final destination is outlined in *Figure F9.1.* On the FPSO the Deck Co-ordinator will ensure the waste is segregated, securely contained, labelled, manifested, and quantities recorded in accordance with this plan.

The Deck Co-ordinator will also arrange waste collection by the Supply Vessels as well as collection at the onshore port landing location. The appropriate WTN must be completed and accompany the waste at all times. The WTN will contain a full description of the waste, the quantity, the process that produced it, how it is contained, and any particular precautions to be taken when handling it. If the waste has a MSDS this will be attached to the WTN and will be transferred with the consignment.

The Deck Co-ordinator will check that containers are suitable for transport to their final destination. The crane operator will weigh the waste and pass the information to the Deck Co-ordinator who will use the gross weights to estimate the weight of waste leaving the facility. The Waste Contractor will accurately weigh the waste once on shore and send recorded weights of the different waste types to the Deck Co-ordinator.

F9.5.2 Support Vessels

The Support Vessel Masters are responsible for waste from the FPSO being landed at Takoradi Port. The onshore landing location will be in accordance with all port regulations and procedures.

F9.5.3 Waste Management Contractor

The Waste Management Contractor(s) are responsible for ensuring that:

- all received wastes are contained and documented correctly;
- vehicles used to transport wastes are roadworthy and meet Tullow minimum vehicle standards;
- all wastes are transferred to approved treatment or disposal sites;
- records are kept of all transfers (using the WTN system);
- a Monthly Waste Report (MWR) is submitted to the Tullow EHS Advisor.

F9.5.4 Non-compliance Procedures

If waste that is not contained or documented correctly arrives at the port, a Non-compliance Incidence (NCI) will be issued to the FPSO EHS Officer. The FPSO IOM and Deck Co-ordinator are responsible for ensuring that appropriate action is taken so that the non-compliance does not occur again and will notify the Support Vessel Masters detailing this action in order for the NCI to be closed out.

F9.6 DATA MANAGEMENT

F9.6.1 Offshore Records

The Deck Co-ordinator will maintain a record of waste types and their estimated weights. This information is used to track waste sent for disposal so that this can be compared with Tullow returns and receipts. The data will include the quantity of macerated food waste discharged to sea.

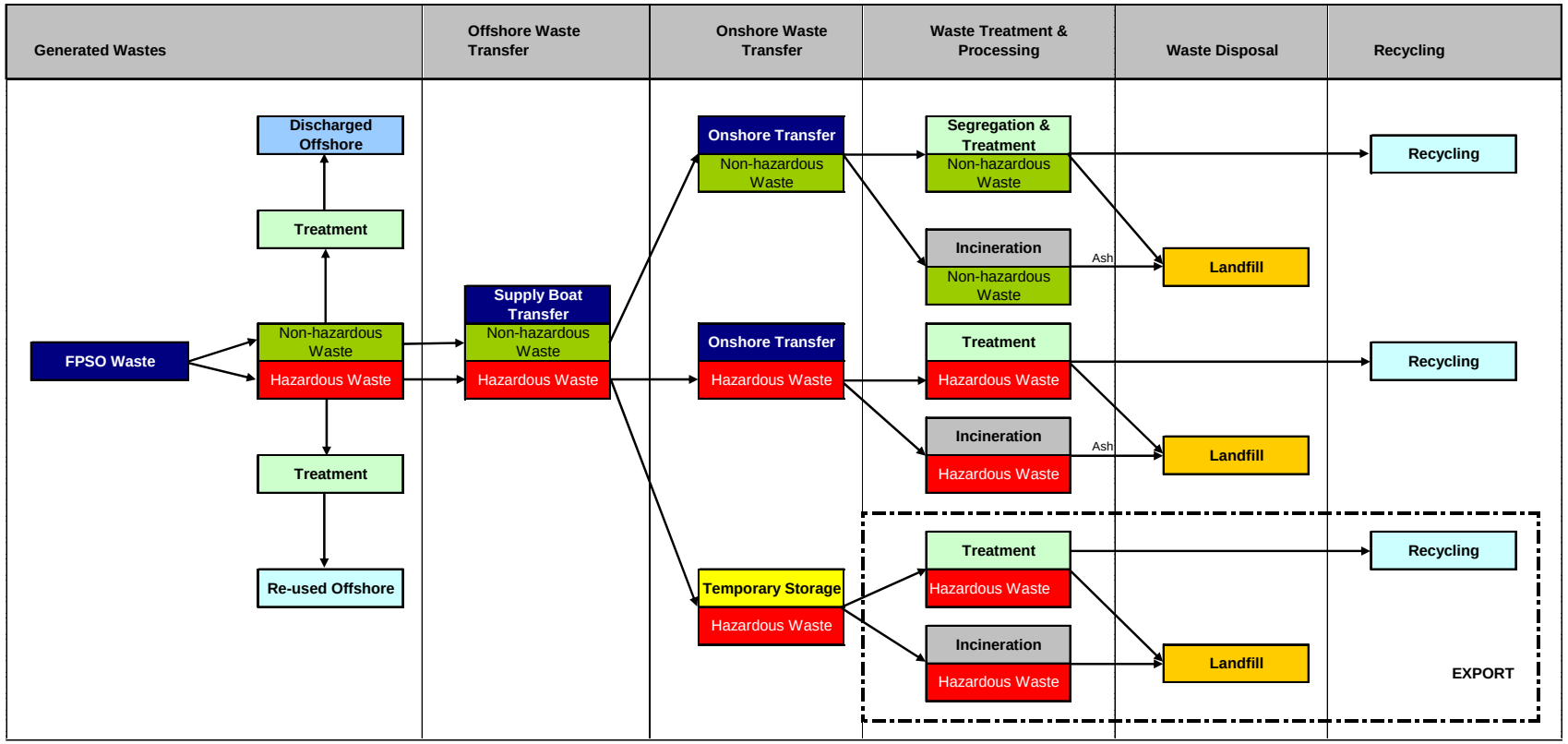
F9.6.2 Monthly Waste Report

The Monthly Waste Report (MWR) returns are issued electronically to the EHS Adviser in Takoradi and are used to track progress against the facility or Tullow waste objectives and targets. The returns are in a format that is consistent with the pro forma report which is completed and submitted annually to senior management by the EHS Adviser.

F9.6.3 Waste Receipts

The Waste Contractor receipts, containing a list of skips received, types of waste and weights are issued on request. The list of skip weights and waste types on receipts will be cross-checked with the records held by the FPSO Deck Co-ordinator.

Figure F9.1 FPSO: Waste Management Transfers, Treatment and Disposal Routes



Note: In-country treatment solutions will be utilised where available

F10 MODU: WASTE MANAGEMENT PROCEDURES

F10.1 INTRODUCTION

This section sets out the MODU-specific practices and controls in place to manage waste generation, segregation, collection and transfer of waste in compliance with the requirements of Tullow management systems

F10.2 IMPLEMENTATION OF PROCEDURES

Resources have been identified on the MODUs for waste management planning and implementation of this WMP. They are:

- designated personnel responsible for waste management on the MODU;
- designated locations on the MODU for the collection and segregation of wastes; and
- dedicated resources to provide waste awareness training to all personnel.

F10.2.1 Designated Personnel: MODU

The personnel detailed in *Table 10.1* have designated roles and responsibilities for the off-shore management of MODU generated wastes. They will be supported by designated shore based staff.

F10.3 COLLECTION, SEGREGATION AND STORAGE OF WASTES

This plan requires separate segregation, storage and documentation for different classes of waste (see *Section F6*). Waste is collected according to the type and classification of the waste and segregated on the MODUs to:

- comply with legislation;
- ensure any incompatible wastes are kept apart;
- facilitate recovery of materials for recycling;
- allow effective management at the port and onshore bases; and
- comply with the EMS.

F10.3.1 Collection and Storage

Various types of containers and receptacles (total unit containers; netted skips, bins, drums etc) are provided for the collection, transport and storage of waste. Containers must be of suitable design to prevent leaks (eg from failure through corrosion), weathering and scavenging, and to facilitate safe transport.

Table 10.1 MODU: Designated Personnel and Responsibilities

Position	Responsibility
MODU IOM	• Overall responsibility for compliance with the WMP • Responsible for ensuring all personnel are aware of waste management procedures
Maintenance Co-ordinator	• Overall waste management and procedural compliance assurance
Deck Co-ordinator	• Ensures appropriate waste containment units are available • Segregates, labels and stores all waste according to procedures • Ensures appropriate information is available on types, quantities and packaging of waste from those generating the waste • Completes all necessary documentation for waste transfer (eg WTN, MSDS etc) and supplies data to EHS Advisor • Retains records of waste disposal for the statutory period
Deck Crew	• Assists in the movement of waste to collection points as required • Informs Deck Co-ordinator when waste containers require shipping • Monitors waste disposal practices on a daily basis and report non-compliances to MODU OIM
Laboratory Technician	• Provides assistance in the identification of waste as requested
Medical Officer	• Ensures clinical wastes are collected in the appropriate containers
EHS Officer	• Ensures all discharges of treated drilling fluids and cuttings comply with EPA discharge standards • Ensures all activities associated with the disposal of NORM are approved by the EPA • Ensures quantities and quality (oil content) of all produced sand discharged to sea is approved and quantities reported
EHS Advisor (Onshore)	• Overall responsibility for the delivery and update of the WMP • Monitors waste management performance against targets and objectives • Provides additional guidance as required • Completes and submits Tullow monthly and annual waste reports
Contractors	• Comply with all relevant legislation, regulations and Tullow policies relating to waste management unless other arrangements are agreed in writing
All Personnel	• Minimise the production of waste • Ensure all wastes are managed in accordance with WMP and procedures

For some segregated wastes, clear plastic bags will be used. This will assist waste handlers in identifying 'contaminated' segregated waste quickly and without risk of injury.

All collection containers must be labelled with the facility's name, waste type and approved mode of disposal. MODU personnel take their waste to the various collection points around the vessel. If required, the deck crew will assist by using the appropriate crane and/or baskets, containers, etc.

The MODU Locator Chart for Waste Collection Containers details the location and type of collection points on the vessel. These charts are displayed around the vessel to facilitate waste collection.

F10.3.2 Segregation

Waste will be segregated into (but not limited to) the following categories:

Hazardous Wastes

- Batteries (large lead acid)
- Chemicals
- Clinical waste
- Contaminated drums
- Fluorescent tubes and bulbs
- Oily hard waste such as filters, rags, PPE and used spill kits
- Oily sludge
- Cooking oil
- Paints
- WEEE

Non-hazardous Wastes

- Dry recyclable materials (eg metal, plastic, glass, paper and card)
- General mixed domestic type waste
- Wood

Colour coded signs are used to indicate containers for the storage of specific waste types as detailed in *Table F6.1*.

F10.3.3 Training

All personnel will receive waste management awareness as part of the MODU induction process. Additional awareness training and information is communicated to personnel through toolbox talks, team briefings and safety meetings. Training material available on the MODU includes:

- Waste management awareness videos
- Waste awareness PowerPoint training package

Where identified, further training for key personnel will be provided. Further guidance and information is available from the EHS Officer or onshore EHS Adviser on all waste issues.

F10.4 WASTES PROCESSED ON THE MODU

F10.4.1 Food

Food waste from the galley will be macerated on the MODU prior to discharge to sea. Organic food wastes generated will be macerated to pass through a 25 mm mesh and discharged more than 12 nm from land with no floating solids or foam.

F10.4.2 Drill Fluids and Cuttings

Water Based Mud

Water based mud (WBM) will be used to drill in the casings during drilling. WBM and cuttings will be discharged directly on the seafloor. The estimated quantities discharged will be reported to the EHS Advisor.

Low Toxicity Oil Based Mud

The low toxicity oil based mud (LTOBM) will be reused during the drilling activities and afterwards recycled by the vendor. All LTOBM cuttings will pass through solids control equipment on board the MODUs to reduce oil on cuttings prior to discharge, so the discharge will meet all EPA effluent standards. The retort method of analysis will be used to measure residual oil on cuttings. The estimated quantities discharged will be measured the EHS Advisor as part of monthly reporting.

F10.5 WASTE STORAGE & TRANSFER TO SHORE

F10.5.1 Waste Storage

With the exception of those wastes processed on the MODU (see above), all other waste will be back-loaded and shipped to shore for treatment or disposal in accordance with these procedures.

The movement of waste from the MODU to its final destination is outlined in *Figure F10.1.* On the MODU the Deck Co-ordinator will ensure the waste is segregated, securely contained, labelled, manifested, and quantities recorded in accordance with this plan.

The Deck Co-ordinator will also arrange waste collection by the Support Vessels as well as collection at the onshore port landing location. The appropriate WTN must be completed and accompany the waste at all times. The WTN will contain a full description of the waste, the quantity, the process that produced it, how it is contained, and any particular precautions to be taken when handling it. If the waste has a MSDS this will be attached to the WTN and will be transferred with the consignment.

The Deck Co-ordinator will check that containers are suitable for transport to their final destination. The crane operator will weigh the containers and pass the information to the Deck Co-ordinator who will use the gross weights to estimate the weight of waste leaving the facility. The Waste Contractor will accurately weigh the waste once on shore and send recorded weights of the different waste types to the Deck Co-ordinator.

F10.5.2 Supply Vessels

The Supply Vessel Master is responsible for waste being landed at Takoradi Port. The onshore landing location should be in accordance with all port regulations and procedures.

F10.5.3 Waste Management Contractor

The Waste Management Contractors are responsible for ensuring that:

- all received wastes are contained and documented correctly;
- vehicles used to transport wastes are roadworthy and meet Tullow minimum vehicle standards;
- all wastes are transferred to approved treatment or disposal sites;
- records are kept of all transfers (using the WTN system);
- a Monthly Waste Report (MWR) is submitted to the Tullow EHS Advisor.

F10.5.4 Non-compliance Procedures

If waste that is not contained or documented correctly arrives at the port, a Non-compliance Incidence (NCI) will be issued to the MODU Deck Co-ordinator. The MODU IOM and Deck Co-ordinator are responsible for ensuring that appropriate action is taken so that the non-compliance does not occur again and will notify the Support Vessel Masters detailing this action in order for the NCI to be closed out.

F10.6 DATA MANAGEMENT

F10.6.1 Offshore Records

The Deck Co-ordinator will maintain a record of waste types and their estimated weights. This information is used to track waste sent for disposal so that this can be compared with Tullow returns and receipts. The data will include the quantity of macerated food waste discharged to sea.

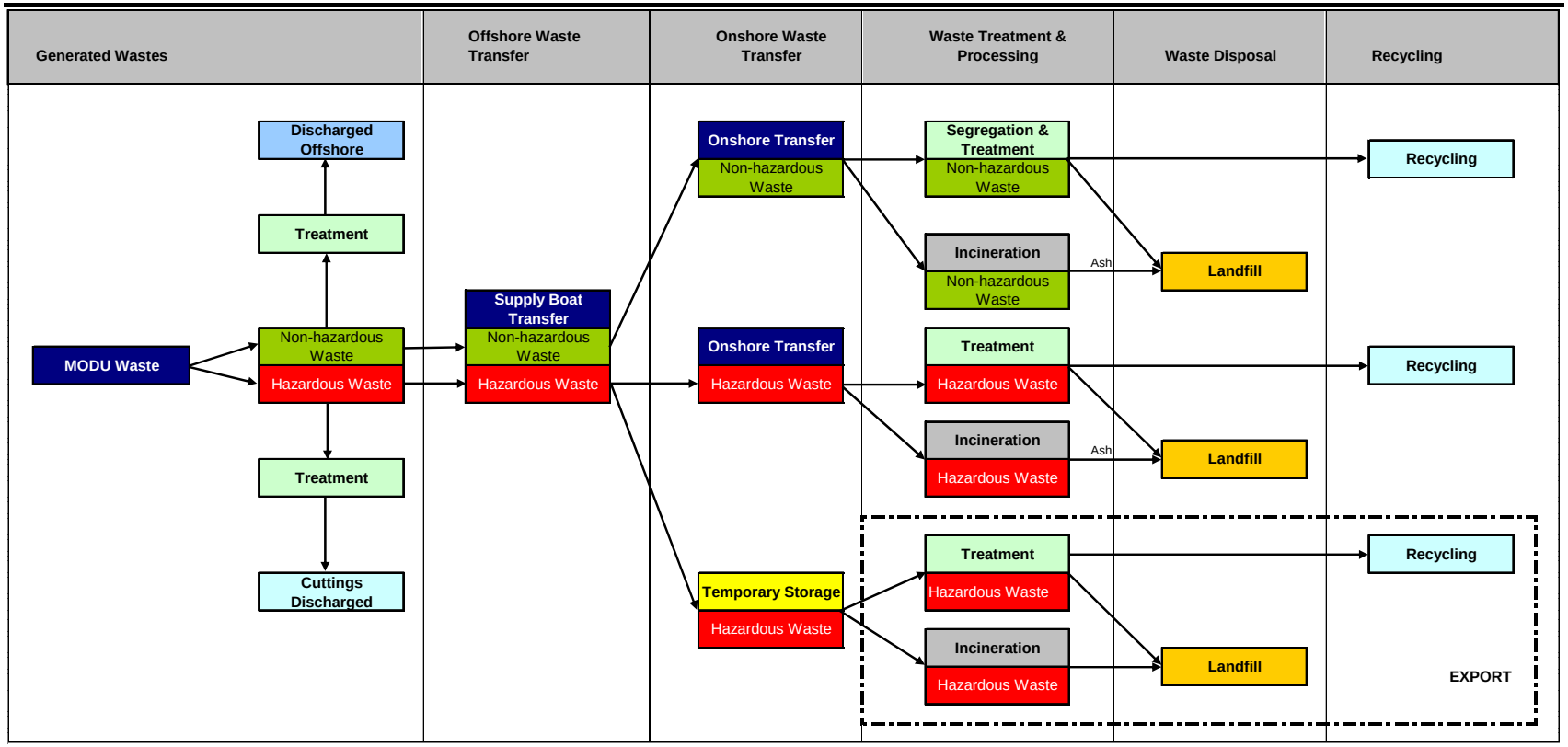
F10.6.2 Monthly Waste Report

The Monthly Waste Report (MWR) returns are issued electronically to the EHS Adviser in Takoradi and are used to track progress against the facility or Tullow waste objectives and targets. The returns are in a format that is consistent with the pro forma report which is completed and submitted annually to senior management by the EHS Adviser.

F10.6.3 Waste Receipts

The Waste Contractor receipts, containing a list of skips received, types of waste and weights are issued on request. The list of skip weights and waste types on receipts will be cross-checked with the records held by the MODU Deck Co-ordinator.

Figure F10.1 MODU: Waste Management Transfers, Treatment and Disposal Routes



F11 SUPPORT VESSEL: WASTE MANAGEMENT PROCEDURES

F11.1 INTRODUCTION

This section sets out the Supply Vessel-specific practices and controls that are in place to manage waste generation, segregation, collection, and transfer of waste in compliance with the requirements of Tullow management systems.

F11.2 IMPLEMENTATION OF PROCEDURES

Resources have been identified on the Supply Vessel for waste management planning and implementation of this WMP. They are:

- designated personnel responsible for waste management on the Supply Vessel;
- designated locations on the Supply Vessel for the collection and segregation of wastes; and
- dedicated resources to provide waste awareness training to all personnel.

F11.2.1 Designated Personnel: Support Vessels

The personnel detailed in *Table F11.1* have designated roles and responsibilities for the off-shore management of Supply Vessel generated wastes. They will be supported by designated shore based staff.

F11.3 COLLECTION, SEGREGATION AND STORAGE OF WASTES

This plan requires separate collection, storage, disposal and documentation for different classes of waste. Waste is collected according to the type and classification of the waste itself and segregated on the Supply Vessel to:

- comply with current legislation;
- allow effective management at the port and onshore base;
- facilitate recovery of materials for recycling;
- ensure any incompatible wastes are kept apart; and
- comply with the EMS.

F11.3.1 Collection and Storage

Various types of containers and receptacles (total unit containers; netted skips, bins, drums etc) are provided for the collection, movement and storage of waste. Containers must be of suitable design to prevent leaks (eg from failure through corrosion), weathering and scavenging, and to facilitate safe transport.

Table F11.1 Supply Vessel: Designated Personnel and Responsibilities

Position	Responsibility
Support Vessel Master	• Overall responsibility for compliance with the WMP • Responsible for ensuring all personnel are aware of waste management procedures
First Officer	• Ensures appropriate waste containment units are available • Segregates, labels and stores all waste according to procedures • Ensures appropriate information is available on types, quantities and packaging of waste from those generating the waste • Completes all necessary documentation for waste transfer (eg WTN, MSDS etc) and supplies data to EHS Advisor • Retains records of waste disposal for the statutory period
Deck Crew	• Assists in the movement of waste to collection points as required • Informs Deck Co-ordinator when waste containers require shipping • Monitors waste disposal practices on a daily basis and report non-compliances to First Officer
EHS Advisor (Onshore)	• Overall responsibility for the delivery and update of the WMP • Monitors waste management performance against targets and objectives • Provides additional guidance as required • Completes and submits Tullow monthly and annual waste reports
Contractors	• Comply with all relevant legislation, regulations and Tullow policies relating to waste management unless other arrangements are agreed in writing
All Personnel	• Minimise the production of waste • Ensure all wastes are managed in accordance with WMP and procedures

For some segregated wastes, clear plastic bags will be used. This will assist waste handlers in identifying 'contaminated' segregated waste quickly and without risk of injury.

All collection containers must be labelled with the facility's name, waste type and approved mode of disposal. Supply Vessel personnel take their waste to the various collection points around the vessel. If required, the deck crew will assist by using the appropriate crane and/or baskets, containers, etc.

F11.3.2 Segregation

Waste will be segregated into (but not limited to) the following categories:

Hazardous Wastes

- Batteries (large lead acid)
- Chemicals
- Clinical waste
- Contaminated drums
- Fluorescent tubes and bulbs

- Oily hard waste such as filters, rags, PPE and used spill kits
- Oily sludge
- Cooking oil
- Paints
- WEEE

Non-hazardous Waste

- Dry recyclable materials (eg metal, plastic, glass, paper & card)
- General mixed domestic type waste
- Wood

Colour coded signs are used to indicate containers for the storage of specific waste types as detailed in *Table F6.1*.

F11.3.3 Training

All personnel will receive waste management awareness as part of the Support Vessels induction process. Additional awareness training and information is communicated to personnel through toolbox talks, team briefings and safety meetings.

Where identified, further training for key personnel will be provided. Further guidance and information is available from the EHS Officer or onshore EHS Adviser on all waste issues.

F11.4 WASTES PROCESSED ON THE SUPPLY VESSELS

F11.4.1 Food

Food waste from the galley will be macerated on the Supply Vessel prior to discharge to sea. Organic food wastes generated will be macerated to pass through a 25 mm mesh and discharged more than 12 nm from land with no floating solids or foam.

F11.5 WASTE STORAGE & TRANSFER TO SHORE

F11.5.1 Waste Storage

With the exception of those wastes processed on the Supply Vessel (see *Section F11)*, all other waste will be returned to shore for treatment or disposal in accordance with these procedures. The Support Vessel generated wastes will be kept separate from any wastes being transferred to shore from other installations.

The movement of waste from the Support Vessel to its final destination is outlined in *Figure F11.1.* On the Support Vessel the First Officer will ensure

the waste is segregated, securely contained, labelled, manifested, and quantities recorded in accordance with this plan.

The First Officer will also arrange waste offloading as well as collection at the onshore port landing location. The appropriate WTN must be completed and accompany the waste at all times. The WTN will contain a full description of the waste, the quantity, the process that produced it, how it is contained, and any particular precautions to be taken when handling it. If the waste has a MSDS this will be attached to the WTN and will be transferred with the consignment. All Support Vessel generated wastes must be reported separately from those being transferred from other facilities.

The First Officer will check that containers are suitable for transport to their final destination. The crane operator will weigh the containers and pass the information to the First Officer who will use the gross weights to estimate the weight of waste leaving the facility. The Waste Contractor will accurately weigh the waste once on shore and send recorded weights of the different waste types to the First Officer.

F11.5.2 Waste Management Contractor

The Waste Management Contractor(s) are responsible for ensuring that:

- all received wastes are contained and documented correctly;
- vehicles used to transport wastes are roadworthy and meet Tullow minimum vehicle standards;
- all wastes are transferred to approved treatment or disposal sites;
- records are kept of all transfers (using the WTN system);
- a Monthly Waste Report (MWR) is submitted to the Tullow EHS Advisor.

F11.5.3 Non-compliance Procedures

If waste that is not packed or documented correctly arrives at the port, a non-compliance incidence (NCI) will be issued to the Support Vessel Deck Co-ordinator. The Supply Vessel Master and First Officer are responsible for ensuring that appropriate action is taken to prevent the non-compliance occurring again and will notify the Supply Vessel Master detailing this action in order for the NCI to be closed out.

F11.6 DATA MANAGEMENT

F11.6.1 Offshore Records

The First Officer will maintain a record of waste types and their estimated weights. This information is used to track waste sent for disposal so that this can be compared with Tullow returns and receipts. The data will include the quantity of macerated food waste discharged to sea.

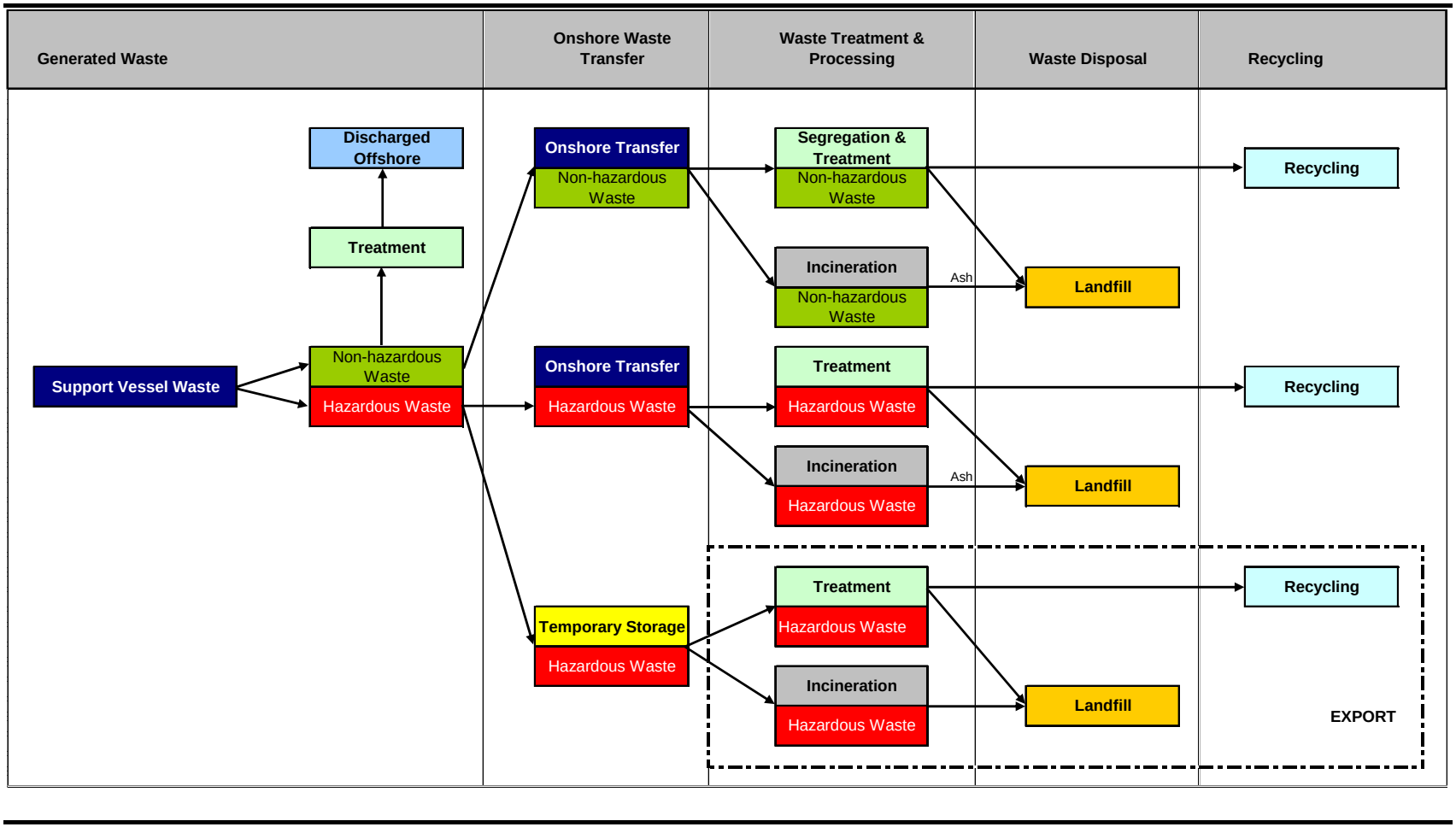
F11.6.2 Monthly Waste Report

The Monthly Waste Report (MWR) returns are issued electronically to the EHS Adviser in Takoradi and are used to track progress against the facility or Tullow waste objectives and targets. The returns are in a format that is consistent with the pro forma report which is completed and submitted annually to senior management by the EHS Adviser.

F11.6.3 Waste Receipts

The Waste Contractor receipts, containing a list of skips received, types of waste and weights are issued on request. The list of skip weights and waste types on receipts will be cross-checked with the records held by the First Officer.

Figure F11.1 Support Vessel: Waste Management Transfers, Treatment and Disposal Routes



F12 SHORE BASE: WASTE MANAGEMENT PROCEDURES

F12.1 INTRODUCTION

This section sets out the Shore Base-specific practices and controls that are in place to manage waste generation, segregation, collection, and transfer of waste in compliance with the requirements of Tullow management systems.

F12.2 IMPLEMENTATION OF PROCEDURES

Resources have been identified at the Shore Base for waste management planning and implementation of this WMP. They are:

- designated personnel responsible for waste management at the Shore Base;
- designated locations at the Shore Base for the collection and segregation of wastes; and
- dedicated resources to provide waste awareness training to all personnel.

F12.2.1 Designated Personnel: Shore Base

The personnel detailed in *Table F12.1* have designated roles and responsibilities for the management of Shore Base generated wastes. They will be supported by designated EHS staff.

F12.3 COLLECTION, SEGREGATION AND STORAGE OF WASTES

This plan requires separate collection, storage, disposal and documentation for different classes of waste. Waste is collected according to the type and classification of the waste itself and segregated at the Shore Base to:

- comply with current legislation;
- allow effective management at the onshore base;
- facilitate recovery of materials for recycling;
- ensure any incompatible wastes are kept apart; and
- comply with the EMS.

F12.3.1 Collection and Storage

Various types of containers and receptacles (total unit containers; netted skips, bins, drums etc) are provided for the collection, movement and storage of waste. Containers must be of suitable design to prevent leaks (eg from failure through corrosion), weathering and scavenging, and to facilitate safe transport.

Table F12.1 Shore Base: Designated Personnel and Responsibilities

Position	Responsibility
Office/Logistics Base Manager	• Overall responsibility for compliance with the WMP • Responsible for ensuring all personnel are aware of waste management procedures
EHS Co-ordinator /Warehouse Superintendent	• Ensures appropriate waste containment units are available • Segregates, labels and stores all waste according to procedures • Ensures appropriate information is available on types, quantities and packaging of waste from those generating the waste • Completes all necessary documentation for waste transfer (eg WTN, MSDS etc) and supplies data to EHS Advisor • Retains records of waste disposal for the statutory period
Maintenance Co-ordinator	• Assists in the movement of waste to collection points as required • Informs Warehouse & Pipeyard Sup. when waste containers require shipping • Monitors waste disposal practices on a daily basis and report non-compliances to Office /Logistics Base Manager
EHS Advisor	• Overall responsibility for the delivery and update of the WMP • Monitors waste management performance against targets and objectives • Provides additional guidance as required • Completes and submits Tullow monthly and annual waste reports
Contractors	• Comply with all Tullow policies, regulations and responsibilities relating to waste management unless other arrangements are agreed
All Personnel	• Minimise the production of waste • Ensure all wastes are managed in accordance with WMP and procedures

For some segregated wastes, clear plastic bags will be used. This will assist waste handlers in identifying 'contaminated' segregated waste quickly and without risk of injury.

All collection containers must be labelled with the facility's name, waste type and approved mode of disposal. Shore Base personnel take their waste to the various collection points around the site. If required, the Maintenance Coordinator will assist by using the appropriate plant.

The Shore Base Locator Chart for Waste Collection Containers details the location and type of collection points on the site. These charts are displayed around the facility to facilitate waste collection.

F12.3.2 Segregation

Waste will be segregated into (but not limited to) the following categories:

Hazardous Wastes

- Batteries (large lead acid)
- Chemicals
- Clinical waste
- Contaminated drums
- Fluorescent tubes and bulbs
- Oily hard waste such as filters, rags, PPE and used spill kits
- Oily sludge
- Cooking oil
- Paints
- WEEE

Non-hazardous Wastes

- Dry recyclable materials (eg metal, plastic, glass, paper and card)
- General mixed domestic type waste
- Wood

Colour coded signs are used to indicate containers for the storage of specific waste types as detailed in *Table F6.1.*

F12.3.3 Training

All personnel will receive waste management awareness as part of the Shore Base induction process. Further training for key personnel will be identified.

Additional awareness training and information is communicated to personnel through toolbox talks, team briefs and safety meetings. Training material available at the Shore Bases includes:

- Waste management awareness videos
- Waste awareness PowerPoint training package

Further guidance and information is available from the EHS Adviser on all waste issues.

F12.4 WASTE STORAGE & TRANSFER

F12.4.1 Waste Transfer

All waste will be collected and transferred for treatment or disposal in accordance with these procedures. The movement of waste from the Shore Base to its final destination is outlined in *Figure F12.1.* At the Shore Base the

Maintenance Coordinator will ensure the waste is segregated, securely contained, labelled, manifested, and quantities recorded in accordance with this plan.

The Maintenance Coordinator will also arrange waste collection by the Waste Contractor from the Shore Base. The appropriate WTN must be completed and accompany the waste at all times. The WTN will contain a full description of the waste, the quantity, the process that produced it, how it is contained, and any particular precautions to be taken when handling it. If the waste has a MSDS this will be attached to the WTN and will be transferred with the consignment.

The Maintenance Coordinator will check that containers are suitable for transport to their final destination. The Waste Contractor will accurately weigh the waste on reception at the Waste Treatment Facility and send recorded weights of the different waste types to the Maintenance Coordinator.

F12.4.2 Waste Management Contractor

The Waste Management Contractor(s) are responsible for ensuring that:

- all received wastes are contained and documented correctly;
- vehicles used to transport wastes are roadworthy and meet Tullow minimum vehicle standards;
- all wastes are transferred to approved treatment or disposal sites;
- records are kept of all transfers (using the WTN system);
- a Monthly Waste Report (MWR) is submitted to the Tullow EHS Advisor.

F12.4.3 Non-compliance Procedures

If waste that is not packed or documented correctly arrives at the Waste Treatment Facility, a non-compliance incidence (NCI) will be issued to the Shore Base Maintenance Coordinator. The Logistics Base Manager and Maintenance Coordinator are responsible for ensuring that appropriate action is taken to prevent the non-compliance occurring again and will notify the EHS Advisor detailing this action in order for the NCI to be closed out.

F12.5 DATA MANAGEMENT

F12.5.1 Onshore Records

The Maintenance Co-ordinator will maintain a record of generated waste types and their estimated weights. This information is used to track waste sent for disposal so that this can be compared with Tullow returns and receipts.

F12.5.2 Monthly Waste Report

The Monthly Waste Report (MWR) returns are issued electronically to the EHS Adviser in Takoradi or Accra and are used to track progress against the facility or Tullow waste objectives and targets. The returns are in a format that is consistent with the pro forma report which is completed and submitted annually to senior management by the EHS Adviser.

F12.5.3 Waste Receipts

The Waste Contractor receipts, containing a list of skips received, types of waste and weights are issued on request. The list of skips and waste types on receipts should be cross-checked with the records held by the Office Base EHS Co-ordinator or Warehouse Superintendent.

Figure F12.1 Shore Base: Waste Management Transfers, Treatment and Disposal Routes