CONSULTANCY TO DEVELOP AN ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF) FOR PROJECT "ENVIRONMENTALLY SOUND MANAGEMENT AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBs) IN NIGERIA

Environmental and Social Management Framework (ESMF). Final Report

Prepared
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CONTENTS

ANNEXES

ACRONYMS

AEDC	Abuja Electricity Distribution Company
BAT	Best Available Technique
BEP	Best Environmental Practice
CARC	Chemistry Advanced Research Centre
CPD	Country Programme Document
EIA	Environmental Impact Assessment
ES	Environmental and Social
ESHS	Environmental, Social, Health and Safety
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
FCT	Federal Capital Territory
FEC	Federal Executive Council
FMEnv	Federal Ministry of Environment
FMoL	Federal Ministry of Labour and Employment
GC-MS	Chromatography-Mass Spectrometry
GEF	Global Environment Facility
GHS	Globally Harmonised System
GSIC	Gender Steering and Implementation Committee
HSMP	Health and Safety Management Plan
IEE	Initial Environmental Examination
MDAs	Ministries, Departments and Agencies
MIS	Management Information System
NCS	Nigeria Customs Service
NERC	National Electricity Regulatory Commission
NESREA	Environmental Standards and Regulations Enforcement Agency
NGO	Non-Governmental Organization
NIM	National Implementation Modality
PBC	Polychlorinated Biphenyl
PCDD	Polychlorinated Dibenzodioxin
PCDF	Polychlorinated Dibenzofuran
PEN	PCB Elimination Network
PMU	Project Management Unit
POP	Persistent Organic Pollutant
POPP	Programme and Operational Policies and Procedures
PPE	Personal Protective Equipment
ROAR	Results Oriented Annual Report
SAICM	Strategic Approach to International Chemicals Management
SES	Social and Environmental Standards
SESP	Social and Environmental Screening Procedure
SHESTCO	Sheda Science and Technology Complex
SOP	Standard Operating Procedure
TCN	Transmission Company of Nigeria
TOR	Terms of Reference

UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WB	World Bank

EXECUTIVE SUMMARY

I. INTRODUCTION

This report develops the Environmental and Social Management Framework (ESMF) for the Project "Environmentally Sound Management and Disposal of Polychlorinated Biphenyls (PBCs) in Nigeria". The Project is under implementation with funding from the United Nations Development Programme (UNDP) and the Global Environment Facility (GEF). UNDP is the GEF Agency and the Federal Ministry of Environment (FMEnv) of Nigeria is the Implementing Partner for the Project.

II. DESCRIPTION OF THE PROJECT

Objective

The objective of GEF's funding of this project is to minimise the risks of exposure of Nigerians and the environment to PCBs, particularly for vulnerable populations, while facilitating the country's commitments to the Stockholm Convention.

Components

The Project consists of the following five Components:
1. Institutional Capacity and Training on PCBs.
2. Inventory in 22 States Not Previously Covered by Other Inventories.
3. Establishment of PCB Collection and Treatment Centres.
4. Environmentally Sound Disposal of Identified PCBs.
5. Monitoring, Learning, Adaptive Feedback and Evaluation.

Implementation Arrangements

The Project will be nationally executed under UNDP's National Implementation Modality. The Federal Ministry of Environment (FMEnv) is the executing partner, responsible for providing policy guidance and co-chairing the Project Steering Committee with UNDP, which will be responsible for the overall coordination and monitoring of Project implementation. The FMEnv, through the Project Management Unit, will also be responsible for coordinating Project activities, including providing technical assistance and implementation support for the development of the new PCB regulations, communicating and disseminating it to the appropriate targets, and ultimately enforcing them. The ministry will also lead the preparation of the technical guidance materials and maintain communication with stakeholders as needed.

The National Electricity Regulatory Commission (NERC), will serve as a go-between, for the Project and electrical institutions, to communicate information and ensure compliance with developed regulations. The Transmission Company of Nigeria (TCN), the Abuja Electricity Distribution Company (AEDC), Kaduna Electric and other electricity companies in Nigeria are providing substantial co-financing to the Project. They will give the Project access to their facilities

and transformers for various activities to be implemented, such as the National Baseline Inventory, as well as PCB wastes, for treatment, and will support disposal activities

III. METHODOLOGICAL APPROACH

The methodological approach applied in the development of the ESMF for the Project "Environmentally Sound Management and Disposal of PBCs" in Nigeria, consists of the following techniques and strategies: i) survey of technical literature; ii) review of UNDP and GEF Environmental and Social Safeguard Policies; iii) review of documents on the Project, as well as on the regulatory, institutional and policy framework for Environmental, Social, Health and Safety (ESHS) management in Nigeria, with particular emphasis on hazardous wastes management; iv) technical consultations; and v) site visits.

IV. LEGAL AND INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT

National Regulatory Framework

The regulatory framework for the environmentally-sound management of PCBs in Nigeria still needs further development and improvement. Whereas a dedicated PCB regulation that specifies conditions for use, handling, transportation and disposal of such materials is still lacking, a number of legal instruments and regulations regarding environmental and human health that could be applied to PCBs exist. In particular, the Environmental Impact Assessment Act No. 86, 1992. Other Relevant National Legal Instruments include: National Environmental Protection (Pollution abatement in Industries and Facilities generating Waste) Regulations, 1991, National Environmental Protection (Management of Solid and Hazardous Wastes) Regulation, 1991, National Guidelines and Standards for Environmental Pollution Control in Nigeria, 1991, National Environmental Protection (Management of Solid and Hazardous Wastes) Regulation, 1991, National Guidelines and Standards for Environmental Pollution Control in Nigeria, 1991, Public Health Law, 2006, National Guidelines on Environmental Management Systems, 1999, and Technical Guidelines and Rule Authorization for the Sound Management of Hazardous Materials and Impounded Goods, 2010.

Institutional Framework

There are four main organisations are identified for the management of chemicals in the country: Federal Ministry of Environment (FMEnv), Federal Ministry of Health (FMoH), and Factory Inspectorate Division of the Federal Ministry of Labour and Productivity (FMoL).

International Regulatory Framework

Nigeria has commitments at the international and regional levels, and has ratified all the Multilateral Environmental Agreements on chemicals and waste. International conventions relevant to the sound management of POPs and other hazardous chemicals to which Nigeria is party include: Stockholm Convention, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989), Bamako Convention on the Control

of Transboundary Movements of Hazardous Wastes within Africa (1991), Globally Harmonised System (GHS) of Classification and Labelling of Chemicals, and Strategic Approach to International Chemicals Management

V. POTENTIAL ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

Potential Positive Impacts

The main positive contributions of the Project to the environmentally sound management of PCBs in Nigeria are as follows:

1. Substantial decrease in the risk of accidental leakage, spill and release of vapours from both in-service and off-line contaminated transformers and other electrical equipment, and the associated notable reduction in potential health and safety hazards to workers and communities and contamination of soil and water bodies, thanks to the decontamination of 1,500 metric tons of PCB-contaminated electrical equipment and disposal of 200 metric tons of pure PCB from transformers and capacitors.
2. The previous positive impacts are also anticipated with respect to the remaining PCBs that will not undergo processing during the implementation of the Project, thanks to the establishment of a treatment centre and the acquisition of decontamination and dechlorination systems under the Project, which will allow electrical utilities to complete the identification, treatment and disposal of contaminated equipment, oil and waste in an environmentally-sound manner using proven and cost-effective technologies demonstrably appropriate to the Nigerian context.
3. Significant reduction in the risk of accidental leakage, spill, release of vapours and cross-contamination with PCBs during the handling, transport and disposal of PCB-containing electrical equipment and wastes, and the consequent notable decrease in the likelihood of generating health and safety hazards to workers and communities and contamination of soil and water bodies, thanks to the wide-ranging capacity building, training and awareness raising activities included in the Project, as well as the update of the regulatory framework for hazardous waste management and the improvement of the existing PCB Management Information System.
4. Substantial savings in terms of preventing and minimising the medium- and long-term health costs of treating potentially affected electrical workers and community members living in close proximity to sites with contaminated equipment in operation or stored, as well as the cost of remediating contaminated storage sites, and soil and water bodies polluted due to accidental PCB releases. The Project will realise these cost savings by taking action in the immediate term to deal with a portion of the existing contaminated equipment, waste and sites and the environmental and social risks that they pose.
5. Generation of opportunities for the expansion of existing private business enterprises, or the development of new ones, as well as the creation and consolidation of job opportunities in the private and public sectors, associated with the different activities involved in the management of PCBs (i.e., transportation of contaminated equipment and wastes, recycling or reuse of recovered metals and mineral oils, treatment of contaminated equipment and wastes, etc.).
6. Regarding Nigeria's global and regional environmental obligations and objectives, the Project will help the country achieve global efforts pursued under the Stockholm Convention to control toxic chemicals in general, eliminate or reduce the release of POPs to the environment and manage PCB waste and PCB-contaminated equipment in an environmentally-sound manner,

as well as obligations to address POPs under the Basel Convention and the Bamako Convention.

Potential Negative Risks

Of the five Components that comprise the Environmentally Sound Management and Disposal of PCBs in Nigeria Project, two are likely to have null to negligible risks. These are Component 1 (Institutional Capacity and Training on PCBs) and Component 5 (Monitoring, Learning, Adaptive Feedback and Evaluation).

The other three Project Components are likely to present adverse risks and impacts, some of which may be significant and, therefore, they will be the subject of more detailed description. These are Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories), Component 3 (Establishment of PCB Collection and Treatment Centres) and Component 4 (Environmentally Sound Disposal of Identified PCBs). The next section summarises those risks.

VI. PREVENTION AND MITIGATION OF POTENTIAL ADVERSE ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

The table provides a summary, structured according to Project Component, of the adverse risks posed by the Project and the pertinent mitigation measures to address them.

Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures

PROJECT COMPONENTS	RISKS	MITIGATION MEASURES
Inventory in 22 States Not Previously Covered by Other Inventories	Occupational health and safety hazards, and pollution of soil and water, due to accidental release of PCB-contaminated oil during **sampling** of transformers	• A spill containment system (e.g., spill trays. absorbent material, etc.) shall be provided as a precaution in case of leakage. • Ensure that all spills are cleaned up immediately, and contaminated soil is disposed of adequately. • An Emergency Preparedness and Response Plan shall be developed and implemented, including treatment and transportation activities. • Workers shall be informed about potential health and safety risks, and instructed regarding safety measures and appropriate work procedures to follow. • Ensure that required personal protective equipment is supplied and used adequately.
Inventory in 22 States Not Previously Covered by Other Inventories and Environmentally Sound Disposal of Identified PCBs	Occupational health and safety hazards, and pollution of soil and water, due to accidental release of PCB-contaminated oil during: **- Temporary storage** of PCB-contaminated equipment and oil pending transportation after sampling activities conducted as part of inventory. **- Temporary storage** of PCB-contaminated equipment and oil previous to their treatment and disposal.	• PCB-contaminated electrical equipment pending decontamination shall be packaged and labelled properly, and placed on an impermeable surface and covered. • Security measures shall be taken against unauthorised removal of electrical equipment from treatment sites. • Ensure safe storage of PCB-contaminated equipment and oil pending transportation in especially-designated, enclosed areas, and only authorised persons shall have permit to enter these areas. • Temporary storage of all hazardous substances shall be in closed safe containers, labelled with details of composition, properties and handling information. Containers of hazardous substances shall be placed on an impervious surface, and fire-fighting equipment shall be provided in the area where the containers are stored. Containers and equipment shall be inspected regularly. • A list of all hazardous substances present on site shall be kept and the material safety data sheets for these substances shall be readily available and regularly updated. • All personnel on site who will be handling hazardous materials shall be trained about their proper use, handling and disposal.
Environmentally Sound Disposal of Identified PCBs	Community and occupational health and safety hazards, and pollution of soil and water, due to accidental release of PCB-contaminated oil during **transportation** of contaminated equipment and oil	• PCB-contaminated electrical equipment and oil shall be packaged and labelled properly during transportation. • Vehicles must be equipped with a spill clean-up kit. • Emergency Preparedness and Response Plan shall be developed and implemented, including treatment and transportation activities.
	Occupational health and safety hazards, and pollution of soil and water, due to accidental release of PCB-contaminated oil during **decontamination** of PCB transformers and other electrical equipment	• Decontamination activities shall be carried out only by trained personnel with adequate personal protective equipment. • Emergency Preparedness and Response Plan shall be developed and implemented, including treatment activities. • Workers shall be informed about potential health and safety risks, and instructed regarding safety measures and appropriate work procedures to follow.

Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures

PROJECT COMPONENTS	RISKS	MITIGATION MEASURES
		• Ensure that required personal protective equipment is supplied and used adequately. • Provide safety signs in work areas. • All operations for decontamination of electrical equipment shall be implemented in covered and well-ventilated building. • A spill containment system shall be provided as a precaution in case of leakage. • Hazardous wastes generated due to decontamination activities shall be disposed of in a licensed facility.
	Occupational health and safety hazards, and pollution of soil and water, due to accidental release of PCB-contaminated oil during ongoing **treatment operations**, such as drainage, destruction, regeneration and refilling, as well as **treatment** of PCB-contaminated electric equipment and oil by mobile PCB decontamination technology	• The work area for draining and packaging shall be clearly marked with a physical barrier and only the personnel involved in the operation shall be allowed to enter the area. • Drained PCB-contaminated dielectric oil shall be stored in closed safe containers, labelled with details of composition, properties and handling information. Containers of hazardous substances shall be shall be placed on an impervious surface, and fire-fighting equipment shall be provided in the area where the containers are stored. Containers with liquids shall be packaged in containers separate from the transformer carcasses and capacitors. Containers and equipment shall be inspected regularly. • PCB-contaminated dielectric oil shall not be mixed with other oils. • After the draining of the transformers, all equipment shall be properly cleaned and all waste from the operation filled into drums and disposed of together with the drained liquid and transformer carcasses. • A spill containment system (e.g., spill trays. absorbent material, etc.) shall be provided as a precaution in case of leakage. • Ensure that all spills are cleaned up immediately, and contaminated soil is disposed of adequately. • Emergency Preparedness and Response Plan shall be developed and implemented, including treatment activities. • The treatment facility should have written instructions and procedures covering: - Reception, storage, draining and decontamination of PCB-containing transformers and oil, including safety procedures. - Clean up of packaging, vehicles, floors, curbing, wells, etc. - Inspection and supervision. - Fire safety and emergency plan. - All instructions and procedures shall be available to the staff and the authorities in English and, as applicable and depending on the region of the country where sites are located, instructions and procedures shall be provided to staff in Hausa, Yoruba or Igbo.

Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures

PROJECT COMPONENTS	RISKS	MITIGATION MEASURES
	Health and safety hazards to communities located close to storage, treatment and decontamination sites	• Provision of site security to storage, treatment and decontamination sites, and installation of warning signage around these sites to prevent access to them by community members and unauthorised persons, and inform the public about presence of hazardous substances and wastes. • Conduct information and education activities with the community to raise awareness about the dangers of exposure to hazardous substances and wastes.
Establishment of PCB Collection and Treatment Centres	**Soil Erosion**: Loss, damage or disruption of soil, with possible introduction of sediments to watercourses, as a result of trenching and vegetation clearing.	• Early installation and regular maintenance of drainage and diversion structures, silt traps, etc; drainage outlets to discharge into vegetated areas if possible; vegetation along watercourses and drainage lines to be retained if possible. • Retention of topsoil for restoration (including tilling and revegetation) as soon as practicable. • Removed soil from trenching operations shall be used for backfilling. • Careful planning of timing of works (overall duration and seasonality, specially avoiding works during the rainy season if possible). • Clear demarcation on project drawings of vegetation to be affected. • Minimisation of cleared areas and soil disturbance, with revegetation as soon as feasible with species adapted to local conditions when applicable. • If the surface to be intervened is small, protection of erodible areas with mulch, and planting with protective vegetation once works are finished; preferably, execution of works during the dry season. • If the surface to be intervened is large, presentation of an adequate erosion and sedimentation control plan, specifying type of device to be applied, installation sequence and location; preferably, execution of works during the dry season.

Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures

PROJECT COMPONENTS	RISKS	MITIGATION MEASURES
	Water and Soil Pollution, and Landscape Degradation: • Trenching and vegetation clearing may create exposed sites. Sediment-laden runoff from cleared areas could impact water quality of downstream watercourses. • Release of hazardous substances associated with construction and maintenance activities or with transport of materials (e.g., accidental spills and leaks), may lead to soil, surface or groundwater contamination. • Inefficient waste management during construction and maintenance activities may lead to inadequate disposal of solid (domestic and construction) and liquid wastes that may pollute soils and watercourses, and visually degrade natural and man-made landscapes.	• Train personnel on waste handling and segregation. • Segregated waste storage containers with appropriate signs (hazardous or non-hazardous) shall be provided at construction sites. • No garbage, refuse, oily waste, fuel, waste oil or removed/excess materials (e.g., asphalt, sidewalks, metal scrap, etc.) shall be discharged into drains, onto site grounds, natural areas or watercourses. • If feasible, reuse of removed/demolished materials (e.g., asphalt, sidewalks, metal scrap, etc.) or donation to local community. In addition, careful selection of adequate sites for final disposal of removed/excess materials not reused or donated. • Implementation of appropriate storage and containment areas (e.g., "bunded" area with impervious "polyliner" or similar) for both new and waste fuel, oil and hazardous materials to prevent and contain any spillage and leaks. • Prompt removal and safe disposal of soil contaminated with hydrocarbons. • Hazardous and oil waste shall be collected and disposed by licensed waste handlers. • Implementation of hazardous materials handling and control procedures (e.g., identify chemical products and store in storage area with restricted access, keep track of movement of each chemical, etc.). • Keep records of waste generation (i.e. type of waste; hazardous or non-hazardous; weight or volume; properties; destination; date; etc.). • Maintenance and cleaning of vehicles, trucks and equipment should take place offsite, and prohibition of vehicle washing in watercourses. • Toilet facilities shall be provided for construction workers to avoid indiscriminate defecation in nearby bush. See soil erosion above for control of water pollution due to released sediments from disturbed construction sites.
	Air Pollution: Dust and exhaust emissions from small-scale construction activities, and movement of construction vehicles and trucks may affect human health.	• Whenever dust generation at construction sites becomes a problem, water spraying to suppress dust shall be undertaken. • Truck drivers shall be sensitised on and ensure they observe speed limits on earth roads to reduce dust generation. • Contractors shall operate only well-maintained construction machinery, vehicles and trucks, and implement a routine maintenance program for all vehicles and trucks. • Engines of vehicles, trucks and earth-moving machinery shall be switched off when not in use.

Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures

PROJECT COMPONENTS	RISKS	MITIGATION MEASURES
	Noise and Vibration: • Use of earth-moving equipment and heavy vehicles may generate noise and vibration. • Excessive noise can be a nuisance to local communities and businesses. • Vibration from compacting equipment may crack walls of structures adjoining work sites.	• Contractors shall implement best driving practices when approaching and leaving construction sites to minimise noise generation created through activities such as unnecessary acceleration and breaking. • Strict control of timing of activities within authorised working hours, including banning work at night. • Minimise noise levels and vibrations (e.g., sound insulation, select equipment with lower sound power levels, install acoustic enclosures for equipment, install suitable mufflers on engine exhausts and compressors components). See also air pollution above.
	Occupational Health and Safety Hazards: Occupational health and safety hazards during execution of construction works.	• Conduct a risk assessment of site safety hazards, and design and implement measures specific to identified hazards. • Train workers on safe work practices, and conduct toolbox talks. • Provide and enforce use of adequate Personal Protective Equipment (PPE) on site including, as applicable, hard hats, overalls, high-visibility vests, safety boots, gloves etc**.** • Put a system in place to track and respond to accidents, incidents, near misses and fatalities. • Except for areas secured by fencing, all active construction areas shall be marked with high-visibility tape, in particular open trenches, to reduce the risk of accidents involving workers, pedestrians and vehicles. • All open trenches and excavated areas shall be backfilled as soon as possible after cable laying and construction has been completed. • Implement good construction site "housekeeping" and control access to active construction sites. • Clear signage shall be used at construction sites. • For physical hazards due to falling objects when performing elevated and overhead work: – The area around which elevated work takes place shall be barricaded to prevent unauthorised access. Working under other personnel shall be avoided. – Hoisting and lifting equipment shall be rated and maintained, and operators shall be trained in their use. – Equipment and fall protection measures shall be used and implemented by individuals. – Ladders shall be used according to pre-established safety procedures (proper placement, climbing, standing, use of extensions). • For risk of fall when working at elevation:

Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures

PROJECT COMPONENTS	RISKS	MITIGATION MEASURES
		– Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance and replacement of fall protection equipment; and rescue of fall-arrested workers, among others. – Establishment of criteria for use of 100 percent fall protection (typically when working over 2 meters (m) above the working surface). The fall protection system should be appropriate for the tower structure and necessary movements, including ascent, descent and moving from point to point. – Installation of fixtures on tower components to facilitate the use of fall protection systems. – Provision of an adequate work-positioning device system for workers. Connectors on positioning systems should be compatible with the tower components to which they are attached. – Safety belts shall be of not less than 16 millimetres (mm). – Ropes should be 5/8 inch (1.6 cm) in diameter, two-in-one nylon or material of equivalent strength. Rope safety belts should be replaced before signs of aging or fraying of fibres become evident. – When operating power tools at height, workers shall use a second (backup) safety strap. See also traffic congestion, creation of hazardous driving conditions and obstruction of access above.
	Community Health and Safety: • Community health and safety hazards during the execution of construction works and transportation of construction materials.	• Except for areas secured by fencing, all active construction areas shall be marked with high-visibility tape, in particular open trenches, to reduce the risk of accidents involving pedestrians, workers and vehicles. • All open trenches and excavated areas shall be backfilled as soon as possible after cable laying and construction has been completed. • Clear signage shall be used at construction sites. • Control of access to active construction sites shall be implemented.

Sources: Cabral, 2017, Annex III, pp. 4-8; UNIDO/GEF, 2017, pp. 18-27; and Lebanese Republic, Ministry of Environment, 2015, pp. 86-115.

VII. ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

Structure of ESMF

The ESMF for the Environmentally Sound Management and Disposal of PBCs in Nigeria Project comprises the following four steps:

1. Environmental and Social Screening.
2. Environmental and Social Scoping.
3. Incorporation of Environmental and Social Sustainability into the Procurement Processes.
4. Environmental and Social Compliance Oversight.

Each ESMF step: i) contains particular tools that serve as practical mechanisms to implement the respective step; ii) specifies institutional responsibilities for the application of each implementation tool; and iii) includes instruments and/or documents to assist in the application of the tools.

The table below provides an overview of the ESMF process. It establishes the steps involved in its application, indicates to which Project Component each step applies and identifies the tools to use in each step of the ESMF process.

Overview of ESMF Process

ESMF Steps	Project Component to Which Step Applies	Tools to Implement Each ESMF Step	Documents/Tools to Support PMU in Implementation of ESMF Step
Environmental and Social Screening	Component 3 (Establishment of PCB Collection and Treatment Centres)	• Exclusion List for Interim Storage Sites (Annex I)	
Environmental and Social Scoping	Component 3 (Establishment of PCB Collection and Treatment Centres), specifically construction of three interim storage facilities		• Generic Terms of Reference for the preparation of the required ESIAs (Annex II). • Required Content for ESIAs in Nigeria (Annex II). • Flow Chart of the Environmental Impact Assessment Review Procedure in Nigeria (Annex II).
Incorporation of Environmental and Social Sustainability into Procurement Processes	Component 3 (Establishment of PCB Collection and Treatment Centres), specifically construction of three interim storage facilities		• TOR for Contractor's Site-Specific ESMP and Site-Specific HSMP (Annex III). • Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures (Table 6.1, Section 6.1, Chapter 6.0, specifically rows corresponding to the Establishment of PCB Collection and Treatment Centres).
	Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories) and Component		• Sections 6.2 and 6.3 of Chapter 6.0 which detail, respectively, for each activity included in Component 2 and Component 4, the risks posed by those activities and the pertinent management

ESMF Steps	Project Component to Which Step Applies	Tools to Implement Each ESMF Step	Documents/Tools to Support PMU in Implementation of ESMF Step
	4 (Environmentally Sound Disposal of Identified PCBs)		measures for the identified risks. These measures can be incorporated as contractual clauses for the operation of interim storage facilities, the treatment centre, the performance of inventories and corresponding analyses, and the packaging and transportation of PCB-contaminated oils, equipment and wastes
Environmental and Social Compliance Oversight	Component 3 (Establishment of PCB Collection and Treatment Centres), specifically construction of three interim storage facilities	• Environmental and Social Compliance Report (Annex IV).	
	Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories). Component 4 (Environmentally Sound Disposal of Identified PCBs)	• Checklist for Inspection of Facilities (Annex V).	

KEY: **ESIA**: Environmental and Social Impact Assessment. **ESMP**: Environmental and Social Management Plan. **HSMP**: Health and Safety Management Plan. **TOR**: Terms of Reference.

Institutional Arrangements for ESMF Implementation

The table below details the institutional arrangements for the implementation of the ESMF process, specifying institutional responsibilities in relation to each step of the ESMF.

Overview of ESMF Process and Institutional Arrangements for Its Implementation

ESMF Steps	Project Component to Which Step Applies	Tools to Implement Each ESMF Step	Documents/Tools to Support PMU in Implementation of ESMF Step	Institutional Responsibilities						
				PMU	UNDP	EIA Division (FMEnv)	NESREA (FMEnv)	Inspectorate Department (FMoL)	Contractor	Supervising Engineer
Environmental and Social Screening	Component 3 (Establishment of PCB Collection and Treatment Centres)	• Exclusion List for Interim Storage Sites (Annex I)		Applies Exclusion List and drops from consideration sites that present risk factors mentioned on List						
Environmental and Social Scoping	Component 3 (Establishment of PCB Collection and Treatment Centres), specifically construction of three interim storage facilities		• Generic Terms of Reference for the preparation of the required ESIAs (Annex II). • Required Content for ESIAs in Nigeria (Annex II). • Flow Chart of the Environmental Impact Assessment Review Procedure in Nigeria (Annex II).	Undertakes separately the procurement of each of the three required ESIAs.	Oversees procurement of each of the three required ESIAs	Carries out screening of project proposals and prepares IEE. Reviews TOR submitted by Project proponent with scope of proposed ESIA. Reviews Draft ESIA. Reviews Final ESIA. Decides whether to grant a Certificate for proposed project to procced with implementation				
Incorporation of Environmental and Social Sustainability into Procurement Process	Component 3 (Establishment of PCB Collection and Treatment Centres), specifically construction of three interim storage facilities		• TOR for Contractor's Site-Specific ESMP and Site-Specific HSMP (Annex III). • Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures (Table 6.1, Section 6.1, Chapter 6.0, specifically rows corresponding to the Establishment of PCB	Includes in Works Contracts clauses for Site-Specific ESMP and Site-Specific HSMP						

ESMF Steps	Project Component to Which Step Applies	Tools to Implement Each ESMF Step	Documents/Tools to Support PMU in Implementation of ESMF Step	Institutional Responsibilities						
				PMU	UNDP	EIA Division (FMEnv)	NESREA (FMEnv)	Inspectorate Department (FMoL)	Contractor	Supervising Engineer
			Collection and Treatment Centres).							
	Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories) and Component 4 (Environmentally Sound Disposal of Identified PCBs)		• Sections 6.2 and 6.3 of Chapter 6.0 which detail, respectively, for each activity included in Component 2 and Component 4, the risks posed by those activities and the pertinent management measures for the identified risks. These measures can be incorporated as contractual clauses in contracts for the operation of interim storage facilities, the treatment centre, the performance of inventories and corresponding analyses, and the packaging and transportation of PCB-contaminated oils, equipment and wastes	Includes mitigation measures defined in Sections 6.2 and 6.3 as contractual clauses in contracts for the operation of interim storage facilities, the treatment centre, the performance of inventories and corresponding analyses, and the packaging and transportation of PCB-contaminated oils, equipment and wastes. Undertakes the procurement of above-mentioned operation contracts.	Oversees procurement of operation contracts.					
Environmental and Social Compliance Oversight	Component 3 (Establishment of PCB Collection and Treatment Centres), specifically construction of three interim storage facilities	• Environmental and Social Compliance Report (Annex IV).		To the extent possible, participates in joint environmental and social field oversight visits with EIA Division		Undertakes environmental and social field oversight of implementation of management measures by Contractors.			Implements environmental and social mitigation and monitoring measures included in Works Contract.	Supervises implementation by Contractor of environmental and social mitigation and monitoring measures
	Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories) Component 4 (Environmentally Sound Disposal	• Checklist for Inspection of Facilities (Annex V).		To the extent possible, participates in joint inspections of facilities with NESREA and Inspectorate Department			Undertakes inspections of facilities to verify compliance with environmental and social requirements included in	Undertakes inspections of facilities to verify compliance with occupational health and safety requirements	Implements environmental, social, health and safety requirements in operation contracts and national regulations	

ESMF Steps	Project Component to Which Step Applies	Tools to Implement Each ESMF Step	Documents/Tools to Support PMU in Implementation of ESMF Step	Institutional Responsibilities						
				PMU	UNDP	EIA Division (FMEnv)	NESREA (FMEnv)	Inspectorate Department (FMoL)	Contractor	Supervising Engineer
	of Identified PCBs)						operation contracts and national regulations	included in operation contracts and national regulations		

KEY: **ESIA**: Environmental and Social Impact Assessment. **ESMF**: Environmental and Social Management Framework. **ESMP**: Environmental and Social Management Plan. **FMEnv**: Federal Ministry of Environment. **FMoL**: Federal Ministry of Labour and Employment. **HSMP**: Health and Safety Management Plan. **IEE**: Initial Environmental Examination. **NESREA**: Environmental Standards and Regulations Enforcement Agency. **PMU**: Project Management Unit. **TOR**: Terms of Reference. **UNDP**: United Nations Programme.

Grievance Redress Mechanism (GRM)

The GRM for the Project will be managed by a Grievance Redress Committee (GRC) formed by, at a minimum, PMU's Technical Officer, a representative of the regional FEMEnv office in the state where the complaint originates and a representative of the local government of the area where the complaint is filed.

The table below details the stages and corresponding steps and timeframes of the GRM for the Project, as well as the forms to use in the GRM process.

GRM Stages, Steps, Timeframes and Forms

Stage	Step	Description	Time Frame
Reception	Identification of complaint or concern	Complaint or concern lodged face to face or by phone; letter or email, or recorded during public/community interaction or consultation. Annex VI includes the Grievance Registration Form, which will be used to formally lodge a complaint by the affected party before the Grievance Redress Committee.	1 Day
Investigation and Inquiry	Complaint or concern assessed and logged	Significance assessed and grievance recorded in the Grievance Logbook, whose format is attached as Annex VII. Significance criteria are as follows: • Level 1: one off event. • Level 2: complaint is widespread or repeated. • Level 3: any complaint (one off or repeated) that indicates breach of Nigerian law or provision of the ESMF.	4-7 Days
	Complaint or concern is acknowledged	Acknowledgement of complaint or concern through appropriate medium.	7-14 Days
Response	Development of response	• Complaint or concern assigned to appropriate party for resolution. • Response development with input from Grievance Redress Committee and affected person or group.	4-7 Days 10-14 Days
	Response signed off	Redress action approved by Grievance Redress Committee. The Grievance Decision Form, attached as Annex VIII, will be used to formally record the decision of the Committee.	4-7 Days
	Implementation and communication of response	Redress action implemented and update of progress on resolution communicated to complainant.	10-14 Days

Follow Up and Close Out	Complaints response	Redress action recorded in Grievance Logbook (see Annex VII). Confirmation with complainant that complaint can be closed or determination of what follow up is necessary.	4-7 Days
	Close grievance	Recording of final sign off of grievance. If grievance cannot be closed, return to second step (Complaint or concern assessed and logged) or refer to recommend third-party arbitration or resort to court of law.	4-7 Days

Environmental and Social Training Plan

MODULE	TARGET AUDIENCE	DURATION
Assessment and management of ESHS risks and impacts of POPs, in particular PCBs in the electrical sector: • Module 1: Potential ESHS risks and impacts. • Module 2: Mitigation of ESHS risks and impacts. • Module 3: Field oversight of ESHS risks and impacts (practical module with site visit).	PMU. NESREA. EIA Division of FMEnv. Inspectorate Department of FMoL.	3 days.

1.0 INTRODUCTION

This report develops the Environmental and Social Management Framework (ESMF) for the Project "Environmentally Sound Management and Disposal of Polychlorinated Biphenyls (PBCs) in Nigeria". The Project is under implementation with funding from the United Nations Development Programme (UNDP) and the Global Environment Facility (GEF). UNDP is the GEF Agency and the Federal Ministry of Environment (FMEnv) of Nigeria is the Implementing Partner for the Project.

This document consists of seven chapters, including this Introduction. Chapter 2.0 provides a description of the Project in terms of its objective, budget, implementation timeline, components and implementation arrangements.

Chapter 3.0 explains the methodological approach applied in the development of the ESMF, which consists of the following techniques and strategies: i) survey of technical literature; ii) review of UNDP and GEF Environmental and Social Safeguard Policies; iii) review of documents on the Project, as well as on the regulatory, institutional and policy framework for Environmental, Social, Health and Safety (ESHS) management in Nigeria, with particular emphasis on hazardous wastes management; iv) technical consultations; and v) site visits.

Chapter 4.0 summarises the Nigerian legal and institutional framework, the international regulatory framework for hazardous chemical management, and the GEF and UNDP environmental and social safeguard requirments pertinent to the design and implementation of the ESMF.

Chapter 5.0 analyses of the anticipated positive and negative environmental and social risks and impacts of the Project. It identifies the overall positive contributions of the Project to the environmentally sound management of PCBs in Nigeria, and conducts a comprehensive description of the likely adverse risks and impacts by Project Component.

Chapter 6.0 provides detailed measures to prevent and mitigate the anticipated negative environmental and social risks and impacts, organised according to the Project Component and its corresponding activities likely to cause them.

Chapter 7.0 provides the details of the ESMF. It explains the structure of the ESMF, establishes the steps involved in its application, indicates to which Project Component each step applies and identifies the tools to use in each step of the ESMF process. Further, this chapter describes the implementation tools, the institutional responsibilities and the supporting documentation associated with, respectively, each step of the ESMF. Finally, this chapter details the institutional arrangements, the ESMF disclosure requirements, the Grievance Redress Mechanism, and the Environmental and Social Training Plan for the implementation of the ESMF.

2.0 DESCRIPTION OF THE PROJECT

This chapter provides a synthesis of the Environmentally Sound Management and Disposal of Polychlorinated Biphenyls (PBCs) in Nigeria Project in terms of its objective, budget, implementation timeline, components and implementation arrangements.

The next five sections describe, respectively, each of the above elements of the Project.[1]

2.1 Objective

"The objective of GEF's funding of this project is to minimise the risks of exposure of Nigerians and the environment to PCBs, particularly for vulnerable populations, while facilitating the country's commitments to the Stockholm Convention.

The project structure is designed to ensure that this overarching goal is achieved through creation of an enabling environment for decommissioning and destruction of Nigeria's estimated inventory of over 7,000 tons of PCB-related wastes" (UNDP/GEF. 2017a, p. 20).

2.2 Budget

"The total cost of the project is USD 49,004,126. This is financed through a GEF grant of USD 6,930,000 and USD 41,824,126 in parallel co-financing, not including UNDP's cash co-finance contribution of USD 250,000" (Ibid, p. 55).

2.3 Implementation Timeline

The planned start and end dates for the Project are, respectively, April 1, 2018 and March 31, 2023. The Project effectively commenced execution in July 2018.

2.4 Components

The Project consists of the following five Components:
1. Institutional Capacity and Training on PCBs.
2. Inventory in 22 States Not Previously Covered by Other Inventories.
3. Establishment of PCB Collection and Treatment Centres.
4. Environmentally Sound Disposal of Identified PCBs.
5. Monitoring, Learning, Adaptive Feedback and Evaluation.

The next five subsections summarise, correspondingly, each of the above Components.

1 This chapter reproduces literally portions of the Project Document for the Project (UNDP/GEF. 2017a).

2.4.1 Institutional Capacity and Training on PCBs

"The capacity of stakeholders will be enhanced based on their required mandate in the management of PCBs, to result in a diverse array of skills and capabilities across stakeholder groups and levels. As such, capacities will be built for all relevant entities engaged in any of the following activities:

- **Policy, Rules and Regulatory Development:** Stakeholder capacity, specifically personnel from the Federal Ministries of Environment, of Health and Labour and Productivity and operators from the electrical companies, will be built to understand and interpret laws, treaties, etc., as well as formulate plans and programmes, and rules and regulations that capture and implement the essence and intent of the laws;
- **Inspection, Compliance and Enforcement:** Training of personnel from the Federal Ministries of Environment, of Health and Labour and Productivity, will focus on the appropriate set of skills and tools to conduct site inspections to ensure compliance and where necessary enforce compliance of regulatory requirements;
- **Monitoring and Evaluation:** Enhance skills to monitor and evaluate project implementation for efficient and effective project management and documentation for personnel from the Federal Ministry of the Environment;
- **Legal Proceedings:** Develop sufficient legal skills to interpret and guide MDAs [Ministries, Departments and Agencies] and other relevant entities on the development and implementation of PCB plans and programs;
- **Import and Export Exercise:** Develop sufficient skill within personnel from the Federal Ministry of the Environment and Customs Department to inspect, process and clear PCB-containing oil, equipment and materials either for export or import into the country;
- **Sampling, Testing and Analysis:** Develop sufficient technical skills within personnel of chemical laboratories, electrical companies and PCB service companies to enable proper protocols in collecting samples, testing and analysing them in a manner consistent with international best practices;
- **Laboratory Science and Technology:** Develop adequate scientific and technical skills to conduct laboratory functions, especially for the identified labs / national reference labs;
- **Packaging and Transportation:** Develop skill sets within the personnel of the Federal Ministry of Environment, electrical companies and PCB service companies to properly package and transport PCB-containing or -contaminated oil, equipment and materials to ensure public health and safety, and preservation of the environment;
- **Storage, Handling and Disposal:** Develop skills within personnel from the Federal Ministry of Environment, electrical companies and operators of the temporary storage facilities and PCB treatment systems for the environmentally-sound management and maintenance of storage facilities, PCB-containing/contaminated oil, and PCB-containing/contaminated equipment and materials, prior to effective disposal using appropriate methodology and technology;
- **Servicing, Repairs and Maintenance:** Develop adequate skills within operators of electrical companies and service companies in charge of servicing, repairing and maintaining PCB-containing equipment, to ensure prevention of cross-contamination, spills and illegal discharges or disposals; and
- **Decontamination and Clean-up Operations:** Develop skill sets in operators of electrical companies, temporary storage facilities and treatment systems in decontaminating and cleaning up equipment and materials contaminated with PCBs" (Ibid, pp. 20-21).

2.4.2 Inventory in 22 States Not Previously Covered by Other Inventories

"The Stockholm Convention requires that signatories have programmes to achieve the complete elimination of PCBs by year 2025. In order to achieve this target Nigeria needs first to know the extent of the PCB problem in the country and subsequently develop initiatives that will facilitate the achievement of desired results. Within this Component therefore, the project will establish the analytical capability in the country required to test for PCB contamination, carry out the testing of 11,000 electrical equipment (mainly transformers in the 22 states not previously covered), and the establishment of the MIS [Management Information System] to house data on the project, including the ones collected through previous studies. Nigeria will then have a recorded PCB inventory to cover the whole country, as well as the tools to continue the testing of the remaining pieces of equipment" (Ibid, p. 21).

2.4.3 Establishment of PCBs Collection and Treatment Centres

"Under this component, safe storage sites will be established for the collection and treatment of the PCBs identified in the course of the inventory. To this end, three sites have been identified as interim storage facilities – Neke Uno Interim Storage Site, Enugu State, Epe Interim Storage Site, Lagos State and the FCT [Federal Capital Territory] site at SHESTCO [Sheda Science and Technology Complex]. The design and construction of the facilities are yet to commence" (Ibid, p. 23).

2.4.4 Environmentally Sound Disposal of Identified PCBs

"At present there is no known facility certified or approved as having the capability, in Nigeria, to treat of dispose of PCBs.
[…]
Based on preliminary estimates, between 20 and 30% of all electrical transformers in Nigeria are contaminated with PCBs above the threshold level of 50 mg/kg. This means that nearly 30,000 transformers scattered all over the country are contaminated with PCBs and need to be properly managed and decontaminated. From previous inventory studies, more than 6,000 metric tons of PCB- contaminated electrical equipment have been already identified. **As part of this project, 1,500 MT of PCB-contaminated equipment (including oil) and 200 MT of pure PCB waste will be properly treated or disposed of, using environmentally sound technologies**.

The PCB equipment and waste to be treated will be transported to the collection and treatment centre, and the disposal of at least 1,500 tons of PCB-contaminated equipment as well as 200 tons of pure PCB equipment will be carried out" (Ibid, pp. 23-24).

2.4.5 Monitoring, Learning, Adaptive Feedback and Evaluation

"A web portal for sharing relevant project information has already been built, which will allow users access to data and documents, based on their user profile. Ultimately, public access will be granted for all the documents which are of public relevance, such as project performance, guidance documents, environmental impact assessment documents etc. Under this project, the website and database management will be enhanced to make the systems more user-friendly, allowing

summaries and multi-media materials of the project activities to be uploaded on the portal periodically" (Ibid, p. 24).

2.5 Implementation Arrangements

"The project will be nationally executed under UNDP's National Implementation Modality (NIM) according to the Standard Basic Assistance Agreement between UNDP and the Government of Nigeria, and the Country Program Document (CPD)" (Ibid, p. 52).

"**The Federal Ministry of Environment (FMEnv)** is the executing partner for the project, responsible for providing policy guidance and co-chairing the project Steering Committee with UNDP, which will be responsible for the overall coordination and monitoring of project implementation. The FMEnv, through the PMU [Project Management Unit], will also be responsible for coordinating project activities, including providing technical assistance and implementation support for the development of the new PCB regulations, communicating and disseminating it to the appropriate targets, and ultimately enforcing them. The ministry will also lead the preparation of the technical guidance materials and maintain communication with stakeholders as needed.

The National Electricity Regulatory Commission (NERC), will serve as a go-between, for the project and electrical institutions, to communicate information and ensure compliance with developed regulations**.** The **Nigeria Customs Service (NCS)** will be particularly important to involve, as they are key to increased enforcement of PCB-related regulations in the country.

The Transmission Company of Nigeria (TCN), the Abuja Electricity Distribution Company (AEDC), Kaduna Electric and other electricity companies in Nigeria are key partners to the project - AEDC and Kaduna Electric are providing substantial co-financing to the project. They will give the project access to their facilities and transformers for various activities to be implemented, such as the National Baseline Inventory, as well as PCB wastes, for treatment, and will support disposal activities – this is essential to the successful completion of the project.

Other partners will play mainly a supportive and advisory role within the project's implementation lifetime, in alignment with their respective mandates and specific project activities" (Ibid, pp. 27-28).

3.0 METHODOLOGICAL APPROACH

The methodological approach applied in the development of the ESMF for the Project "Environmentally Sound Management and Disposal of PBCs" in Nigeria, consists of the following techniques and strategies: i) survey of technical literature; ii) review of UNDP and GEF Environmental and Social Safeguard Policies; iii) review of documents on the Project, as well as on the regulatory, institutional and policy framework for Environmental, Social, Health and Safety (ESHS) management in Nigeria, with particular emphasis on hazardous wastes management; iv) technical consultations; and v) site visits.

The following five sections describe each of the above techniques and strategies in, respectively, the order listed.

3.1. Survey of Technical Literature

The survey specifically focused on technical literature dealing with the following two topics: i) Environmental and Social (ES) Management Frameworks/Systems/Procedures;[2] and ii) Environmental and Social Assessment and Management tools.

The examination of literature on the above two areas encompassed materials suitable and practical for the design of the ESMF for the Project. In this sense, the review emphasised, on the one hand, ES Management Frameworks/Systems/Procedures prepared for executing agencies whose objectives and scope of activities are similar to those of the Project Management Unit (PMU) and, on the other, ES Assessment and Management tools applicable to projects in the hazardous waste management sector, in particular dealing with PCBs.

The next two subsections describe the types of publications included in and the purposes pursued with the literature survey of, respectively, the two substantive areas mentioned above.

3.1.1 ES Management Frameworks/Systems/Procedures

This survey covered ES Management Frameworks/Systems/Procedures designed for executing agencies receiving funding from multilateral and regional funding institutions, as well as from bilateral and international donors, whose aim is to implement the environmentally sound management and disposal of hazardous wastes, with particular reference to PCBs.

Given that the funding for the Environmentally Sound Management and Disposal of PCBs in Nigeria Project comes from an international source, the review included only, as indicated, publications from international financiers and donors, especially the GEF, which has a large portfolio of PCB management projects.

[2] The literature contains materials that use terms such as Environmental Quality Control System, Environmental Assessment Procedure, Environmental and Social Assessment Procedure, among others, to refer to approaches and procedures that essentially have the same purposes as an ESMF. These terms were used before the designation ESMF became standard.

This review helped to establish international best practices in the conceptualization of ESMFs in terms of the stages/steps involved (e.g., screening, scoping, field oversight, etc.) and instruments applied (e.g., checklists, templates, etc.) that served, in the first place, as a general reference in the preparation of the ESMF for the Project. In the second place, a closer examination of materials on this topic aided in the establishment of specific stages/steps and tools that may be replicated or adapted to the particular characteristics of and requirements for the Environmentally Sound Management and Disposal of PCBs in Nigeria Project, as well as the Nigerian regulatory and institutional framework for environmental and social management.

3.1.2 ES Assessment and Management Tools

This review included publications dealing with practical tools and instruments useful in the assessment and management of environmental and social impacts and risks of hazardous waste management projects. Although the examination of published works on ES Management Frameworks/Systems/Procedures proposed in the previous section helped to identify several of these tools, this part of the review focused on specialised socio-environmental literature specifically in the hazardous waste management sector, especially regarding PCBs, not produced in the context of the preparation of ESMFs. Some of the sources for this survey comprised technical publications produced or sponsored by the United Nations Environment Programme (UNEP) in relation to the implementation of the Stockholm and Basel Conventions, bilateral and international donors, and multilateral and regional development banks.

The review considered the following two types of tools:

- Tools developed for: i) rapid identification, screening and scoping of potential project impacts and risks; and ii) socio-environmental categorization of projects. Examples of these instruments are, among others, impact checklists, matrices and lists; project exclusion lists; project screening questionnaires; and ES prioritization criteria.
- Tools designed for: i) establishing the scope of studies; ii) performing ES due diligence; iii) incorporating ES sustainability considerations into bidding processes and works contracts; and iv) reporting on and following-up of ES performance. Examples of these instruments are, among others, TORs for Environmental and Social Impact Assessments, and for Environmental and Social Management Plans; templates for ES due diligence; ES criteria for evaluation of bids, and ES, health and safety clauses for works contracts for small-scale infrastructure, and hazardous waste management and disposal projects; ES health and safety inspection lists/checklists; templates for periodic reporting on ES performance; and guidelines for ES field oversight.

The aim of this survey was to refine and finalise the selection of the specific tools used in the operationalization of the ESMF. These tools are simple, practical, easy to use and time-efficient in their application.

3.2 Review of GEF and UNDP Environmental and Social Safeguard Standards

The review covered the GEF *Policy on Agency Minimum Standards on Environmental and Social Safeguards* (GEF, 2015a), the GEF *Policy on Gender Equality* (Ibid, 2017), which superseded the GEF *Policy on Gender Mainstreaming* (Ibid, 2012), and the UNDP *Social and Environmental*

Standards (SES) (UNDP, 2014a) and its accompanying *Social and Environmental Screening Procedure* (SESP) (Ibid, 2016). The aim was to determine which standards are applicable to the Project in order to make certain that the design of the ESMF facilitates and ensures compliance by the Project with those standards that are pertinent.

In 2011, the GEF Council required that all GEF Agencies[3] met the same standards that entities applying for accreditation as GEF Project Agencies.[4] Consequently, the GEF Council requested the GEF Secretariat to assess the extent to which GEF Agencies complied with its *Policy on Agency Minimum Standards on Environmental and Social Safeguards*, and its *Policy on Gender Mainstreaming* (GEF, 2013, p. 3). UNDP is a GEF Agency and, therefore, underwent this assessment.

As a result of the safeguards compliance assessment conducted by the GEF and the updates of the safeguard policies and procedures undertaken by UNDP largely in response to this assessment, the GEF Secretariat determined that UNDP's Social and Environmental Standards (SES) met all of the requirements of the GEF Safeguards Policy (GEF, 2014, pp. 4-5). Further, the GEF Secretariat concluded that, taken together, the UNDP *Gender Equality Strategy* (first published in 2008, and updated in 2014 and 2018), as well as other operational mechanisms implemented by this agency, namely the Programme and Operational Policies and Procedures (POPP), the Gender Marker tracking system on budgeting, the Results Oriented Annual Report (ROAR), and the Gender Steering and Implementation Committee (GSIC), made UNDP compliant with all of the requirements of the GEF *Policy on Gender Mainstreaming* (Ibid, 2013, p. 7).

The above means that as long as the Project "Environmentally Sound Management and Disposal of PBCs in Nigeria" complies with the requirements of UNDP's SES and its associated SESP, as well as UNDP's Gender Strategy and associated procedures, the Project will also be in observance of GEF's environmental, social and gender safeguard requirements.

3.3 Review of Documents on Project, Nigerian Environmental and Social Management Framework, and Hazardous Waste Management in Nigeria

This review encompassed documentation on the following topics: i) Environmentally Sound Management and Disposal of PBCs in Nigeria Project; ii) the GEF/WB-funded PCB Management Project, implemented from July 2012 to December 2015; iii) legal, policy, planning and institutional framework for environmental and social management in the country; and iv) hazardous waste management in Nigeria. The next four subsections describe the scope, purposes and sources for the examination of documentation dealing with, respectively, the four themes indicated.

3 A GEF Agency is: "Any one of the 10 institutions that have direct access to the GEF Trust Fund resources as of November 2010" (GEF, 2015b, p. 1).

4 A GEF Project Agency is: "Any institution that the GEF has accredited to receive GEF resources on behalf of countries to implement GEF-financed projects under the provisions of paragraph 28 of the Instrument apart from the ten GEF Agencies" (Ibid).

3.3.1 Environmentally Sound Management and Disposal of PBCs in Nigeria Project

The purpose of this review was to obtain an in-depth understanding of the Project objectives, components, institutional framework, implementation timetable and ES sustainability requirements.

The main sources for this review were the following available reports on the Project: i) *Project Document for Environmentally Sound Management and Disposal of PCBs in Nigeria* (UNDP/GEF, 2017a); ii) *Project Document for Environmentally Sound Management and Disposal of PCBs in Nigeria. Annex F. Social and Environmental Screening Template* (Ibid, 2017b); and iii) *Report of the Inception Workshop for the Environmentally Sound Management and Disposal of Polychlorinated Biphenyls (PCBs), 10 – 12 April, 2018* (UNDP, 2018).

3.3.2 PCB Management Project

Given that, on the one hand, the Environmentally Sound Management and Disposal of PCBs in Nigeria Project builds upon and continues the work accomplished with the implementation of previous projects dealing with the management of PCBs in Nigeria, but in particular the WB/GEF-funded PCB Management Project, executed from July 2012 to December 2015 and, on the other, both of these projects have similar components, it was important to examine documentation on the latter project in order to identify lessons learned in the design, implementation and supervision of the environmental and social management of this project that can serve to improve the environmental and social performance of the new Project currently under implementation.

The review focused on the similar components of both projects of concern in terms of potential negative Environmental, Social, Health and Safety (ESHS) impacts and risks, namely: i) inventory of PCBs; ii) establishment of PCB collection and treatment facilities; and iii) disposal of PCBs. In particular, the review covered sections of reports dealing with ESHS impact mitigation and management, and on-site supervision.

The main references for this review of the PCB Management Project were: i) *Integrated Safeguards Datasheet. Appraisal Stage* (WB, 2010); ii) *Project Appraisal Document* (Ibid, 2011); and iii) *Implementation Completion and Results Report* (Ibid, 2016).

3.3.3 Legal, Policy, Planning and Institutional Framework for ESHS Management in Nigeria

The review centred on regulations. It covered permit requirements, procedures and institutional responsibilities regarding the Environmental and Social Impact Assessment (ESIA) process, the management of hazardous wastes, occupational and community health and safety, and pollution standards and control. To a lesser extent, it considered ES issues, plans and policies in general in Nigeria.

The aims were to: i) gain knowledge and get an understanding of Nigeria's ESHS management framework; and ii) become familiar with ESHS management issues in general in the country and in the hazardous waste management sector in particular.

The main published references included:

- Constitution of the Federal Republic of Nigeria (1999).
- National Policy on the Environment (Revised 2016).
- National Policy on Occupational Health and Safety.
- National Environmental Standards Regulations and Enforcement Agency (Establishment) Act (2007).
- Environmental Impact Assessment Act (No. 86 of 1992).
- Environmental Impact Assessment Procedural Guidelines (1995).
- National Environmental (Permitting and Licensing System) Regulations, S. I. No. 29 (2009).
- Factories Act, CAP. F1 L.F.N. (2004).
- Labour Act, CAP. L1 L.F.N. (2004).
- National Guidelines and Standards for Environmental Pollution Control in Nigeria (1991).
- Public Health Law (2006).
- National Environmental (Construction Sector) Regulations, S. I. No. 19 (2010).
- Nigerian Electricity Health and Safety Code (2014).

3.3.4 Hazardous Waste Management Sector in Nigeria

The review emphasised the overall policy and planning framework, as well as the organizational structure of the sector, with particular emphasis on PCBs. The aim was to become familiar with these topics.

The main sources consisted of the following documents:

- National Policy Framework on PCB Management in Nigeria (2015).
- Draft National Environmental (Polychlorinated Biphenyls Control and Disposal) Regulations (2017).
- Technical Guidelines and Rule Authorization for the Sound Management of Hazardous Materials and Impounded Goods (2010).
- Okoh, Michael P. 2014. *Feasibility Studies of Disposal Options of PCBs. Final Report*. Abuja: WB/GEF PCB Management Project.
- Uwagbale, Edward-Ekpu Douglas. *Hazardous Waste Management and Challenges in Nigeria*. Public Health International. Vol. 1, No. 1, 2016, pp. 1-5.
- Harmful Waste (Special Criminal Provisions) Act, CAP. H1 L.F.N. (2004).
- National Environmental (Energy Sector) Regulations (2014).
- National Environmental (Sanitation and Waste Control) Regulations (2009).
- National Environmental Protection (Management of Solid and Hazardous Wastes) Regulation, S. I. No. 15 (1991).
- National Environmental Protection (Pollution Abatement in Industries and Facilities Generating Waste) Regulations, S. I. No. 9 (1991).

3.4 Technical Consultations

The execution of all of the tasks and responsibilities of the Consultancy Services for the design of the Environmental and Social Management Framework for the Environmentally Sound

Management and Disposal of PCBs in Nigeria Project were undertaken following an exhaustive and extensive technical consultation process, in particular with the Programme Analyst of the Sustainable Development Unit at the UNDP Nigeria Country Office, and the Project Coordinator of the Project Management Unit (PMU). Further, the design of the ESMF required close consultations with other key stakeholders comprising:

- The Inspection and Enforcement Department at the Environmental Standards and Regulations Enforcement Agency (NESREA), a parastatal under the aegis of the Federal Ministry of Environment (FMEnv).
- The Hazardous Waste Management, Cleaner Production and Environmental Services Division of the Pollution Control and Environmental Health Department at the FMEnv.
- The Environmental Impact Assessment (EIA) Division of the Environment Assessment Department at the FMEnv.
- The Inspectorate Department at the Federal Ministry of Labour and Employment (FMoL).
- The Environment and Social Unit at the Abuja Electricity Distribution Company (AEDC).
- The Environmental, Resettlement and Social Sub-Unit within the Chemical, Safety and Environmental Unit of the Transmission Company of Nigeria (TCN).
- The Chemistry Advanced Research Centre (CARC) at the Sheda Science and Technology Complex (SHESTCO).
- Non-Governmental Organisations (NGOs).

The formats for the technical exchanges included face-to-face meetings, telephone and video conferences, e-mail messages, administration of open-ended questionnaires and written reviews of submitted deliverables.

The next eight sections describe the scope of the technical consultations with, respectively, the key stakeholders and actors identified above.

3.4.1 UNDP and PMU

The consultations involved mainly the Programme Analyst of the Sustainable Development Unit at the UNDP Nigeria Country Office, and the Project Coordinator and the Technical Officer of the PMU.

The main topics of consultation were the following:

- Details on Project design, work plan, implementation progress, PMU institutional capacity and inter-organisational arrangements for the execution of the Project, including role of UNDP.
- Methodological approach to the design of the ESMF.
- Specifics of the design of the ESMF (steps, implementation tools, institutional responsibilities, etc.).
- Assessment of the institutional capacity of the PMU to implement the ESMF, and evaluation of environmental and social capacity strengthening needs.
- Regulatory, institutional, policy and planning framework for ESHS management in Nigeria, with particular reference to hazardous waste management and more specifically to PCBs. In addition, identification of key documents to collect and review in these areas.
- Identification of key stakeholders from the public and private sectors, as well as civil society, to contact during the Social and Environmental Safeguards Expert’s mission to Nigeria.

- Selection of Project sites to visit, consisting of a potential future PCB-contaminated equipment storage facility and electrical substations where PCB-containing generators are still under operation.
- Available information on the initial selection of sites for the storage of PCBs and the facility for the treatment of these compounds (e.g., selection criteria, site studies/analyses, etc.).
- In-country capacity to test electrical equipment for the presence of PCBs, dechlorinate PCBs, store electrical equipment contaminated with PCBs, decontaminate electrical equipment, recycle metal parts from decontaminated electrical equipment, transport hazardous wastes, and safely dispose of PCBs.[5]
- Lessons learned in the design, implementation and supervision of the environmental and social management of the WB/GEF-funded PCB Management Project that can serve to improve the environmental and social performance of the Environmentally Sound Management and Disposal of PCBs in Nigeria Project.
- Definition of the Social and Environmental Safeguards Expert's in-country detailed mission agenda.

3.4.2 Inspection and Enforcement Department of NESREA

The technical exchanges focused chiefly on the following themes:

- Regulatory, policy and institutional framework for hazardous waste management in Nigeria, with particular reference to PCBs, including permitting requirements.
- Institutional capacity and experience of the Department in conducting inspections of hazardous wastes, including PCBs, storage and treatment facilities, enforcing hazardous wastes regulations, and providing awareness about the need for regulating the sector and the harmful effects of these substances.
- Capacity building needs of the Department in connection with the implementation of the Project.
- Interinstitutional coordination and collaboration mechanisms with other agencies with responsibility in environmental, health and safety enforcement, namely the Hazardous Waste Management, Cleaner Production and Environmental Services Division and the Environmental Impact Assessment (EIA) Division, both of which are part the FMEnv.

3.4.3 Hazardous Waste Management, Cleaner Production and Environmental Services Division of FMEnv

The consultations focused on the following concerns:

- Regulatory, policy and institutional framework for the transboundary movement of hazardous wastes in Nigeria, with particular reference to PCBs, including permitting requirements.

5 Originally, the methodological approach included consultations with a sample of private sector providers of testing and dichlorination equipment, metal recycling services, and hazardous waste transportation and final disposal, as a way of obtaining a broad picture of the capacity of the private sector to provide some of these services to the Project. However, during discussions held with UNDP and the PMU in the course of the execution of the Social and Environmental Safeguards Expert mission to Nigeria, it was concluded that it would be inappropriate to contact some of the potential service providers because the bidding processes for some of the required services were underway at the time of the mission. As a result, it was agreed that a review of the websites of some of the companies offering the required services would serve as the means of gauging in-country capacity in the areas mentioned.

- Institutional capacity and experience of the Division in conducting inspections of hazardous wastes, including PCBs, imported into and exported out of the country, enforcing hazardous wastes regulations dealing with the transboundary movement of hazardous wastes, and providing awareness about the need for regulating the sector and the harmful effects of these substances.
- Capacity building needs of the Division in connection with the implementation of the Project.
- Interinstitutional coordination and collaboration mechanisms with other agencies with responsibility in environmental, health and safety enforcement, namely NESREA and the Environmental Impact Assessment (EIA) Division, both of which are part the FMEnv. Further, interinstitutional coordination and collaboration mechanisms with the Nigeria Customs Service regarding the transboundary movement of hazardous wastes.

3.4.4 Environmental Impact Assessment (EIA) Division of FMEnv

As the environmental authority responsible for the coordination of the ESIA process in Nigeria, managerial and technical staff of the Division took part in discussions dealing with the following issues:

- Regulatory, policy and institutional framework for the ESIA process in the country, particularly in relation to hazardous wastes, including permitting requirements.
- Determination of whether any of the activities included in the Project components will require an ESIA and a corresponding EIA Certificate, in particular the construction of each of the three collection facilities and the treatment centre, and the operation of the collection and final disposal sites.
- How the ESMF for the Project fits within the Nigerian ESIA process, and national regulatory and institutional requirements that the ESMF must meet.
- Specifics of the design of the ESMF (steps, implementation tools, institutional responsibilities, etc.).
- Institutional capacity and experience of the Division in conducting inspections and audits of hazardous waste generation, storage and disposal facilities, including PCBs, enforcing the EIA Act and Guidelines, and providing awareness about the need for and benefits of implementing the requirements of the EIA Act.
- Capacity building needs of the Division in connection with the implementation of the Project.

3.4.5 Inspectorate Department of FMoL

The technical exchanges focused on the following concerns:

- Regulatory, policy and institutional framework dealing with occupational health and safety in Nigeria, with particular reference to hazardous waste generation, storage and disposal facilities, and especially PCBs, including permitting requirements.
- Institutional capacity and experience of the Department in conducting inspections of hazardous waste generation, storage and disposal facilities, including PCBs, enforcing provisions of the Factories Act related to workforce health and safety, and providing awareness about the need for and benefits of implementing those provisions.
- Capacity building needs of the Department in connection with the implementation of the Project.

3.4.6 Environment and Social Unit of AEDC, and Environmental, Resettlement and Social Sub-Unit of TCN

The consultations with each of these entities took place separately and encompassed the following main topics:

- Organisational structure and institutional capacity of each entity to perform ESHS compliance, monitoring and auditing obligations. In particular, whether:
  - ✓ There are dedicated internal structures to carry out ESHS operations.
  - ✓ There is staff exclusively dedicated to ESHS tasks and, if so, its size, qualifications and experience, including with management of hazardous wastes, in particular PCBs.
  - ✓ Specific procedures and accompanying tools are in place to perform ESHS functions (e.g., inspection checklists; audit protocols, etc.).
  - ✓ An Environmental and Social Management System has been adopted and, if so, whether it has received certification.
  - ✓ Training and awareness are provided regularly on specific ESHS topics such as, among others, safe work practices for particular tasks and hazardous waste management.

- Capacity building needs in connection with the implementation of the Project.

3.4.7 Chemistry Advanced Research Centre of SHESTCO)

The technical discussions focused chiefly on the following themes:

- Experience and expertise dealing with hazardous waste treatment and storage, particularly PCBs.
- Capacity to undertake the additional tasks demanded by the Project, specifically dealing with the treatment and storage of PCBs, and capacity building and additional support required from the Project to carry out the expanded activities successfully.

3.4.8 NGOs

The consultations involved NGOs with interest, expertise and experience in hazardous waste management issues, and comprised the main following topics:

- Brief background on the NGO: year founded, areas of interest/activity/expertise, funding sources and membership.
- Involvement in hazardous waste management issues with, if applicable, particular reference to PCBs.
- If applicable, experience with participation in the preparation/implementation/monitoring of the GEF/WB PCB Project.
- If applicable, experience with participation in preparation of the GEF/UNDP PCB Project, and plans for involvement in implementation/monitoring of this Project.
- Role played by female members of the organization in the above activities.

3.5 Site Visits

The site visits involved visual inspections of two types of facilities: i) a potential future PCB-contaminated equipment storage site; and ii) electrical substations where PCB-containing generators are still online.

The purpose of the visit to the potential storage facility was to do a quick visual survey of the areas of implementation and influence of the site, in order to get an idea of their environmental and social suitability in terms of aspects such as, among others:

- Surrounding land use types and their intensities (i.e., institutional, educational, residential, commercial, agricultural, tourist, vegetation, etc.).
- Potential presence of nearby areas of biological, historical, archaeological or religious value.
- Potential existence of adjacent natural features such as water flows, forests, vegetation of biological interest, etc.
- Susceptibility of the site to natural hazards such as floods, landslides, etc.

The aims of the visit to the substations were to:

- Observe the health and safety measures and procedures in place for the operation of the substations, in particular those related to the handling of hazardous chemicals, management of hazardous wastes, preventive and corrective measures for accidental spills of transformer oil and other hazardous chemicals, and overall site security, including physical separation of site from surrounding area and control of access to site.
- At substations where PCB-containing generators are still online, determine whether their operation follows international good practices in terms of clearly labelling them, providing adequate safeguards in case of accidents (i.e., whether generators are placed on an impervious surface, are enclosed in a bunded area and have roofs), implementation of safe work practices during their maintenance, use of personal protective equipment, among others.

4.0 LEGAL AND INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT

The following four subsections summarise, respectively: i) the national environmental and social regulatory framework; ii) the national institutional framework for environmental and social management; iii) the international regulatory framework for hazardous chemical management[6]; and iv) the environmental and social safeguard requirements of the funding agencies of the Project (i.e., GEF and UNDP).

4.1 National Regulatory Framework

The regulatory framework for the environmentally-sound management of PCBs in Nigeria still needs further development and improvement. As recently as March 2015, the Federal Executive Council (FEC) adopted the National Policy Framework on PCB Management in Nigeria. However important pieces of regulations such as those required for owners of electrical equipment to test and properly manage and dispose of PCB-contaminated equipment still do not exist.

The lack of regulatory requirements makes the testing of electrical equipment a voluntary activity; thus, owners are neither required to inform the government of their findings nor required to take proper steps to manage the PCB-contaminated equipment.

Whereas a dedicated PCB regulation that specifies conditions for use, handling, transportation and disposal of such materials is still lacking, a number of legal instruments and regulations regarding environmental and human health that could be applied to PCBs exist. In particular, the Environmental Impact Assessment Act No. 86, 1992 provides guidelines for activities of development projects for which an Environmental and Social Impact Assessment (ESIA) is mandatory in Nigeria. The Act also stipulates the minimum content of an EIA and is intended to inform and assist proponents in conducting EIA studies, against dumping of harmful waste on any land, territorial waters, and Exclusive Economic Zones or the country's inland water ways. The Act also prescribes severe penalties for any persons found guilty of any crime relating thereto.

Other Relevant National Legal Instruments include the following:

- National Environmental Protection (Pollution abatement in Industries and Facilities generating Waste) Regulations, 1991.
- National Environmental Protection (Management of Solid and Hazardous Wastes) Regulation, 1991.
- National Guidelines and Standards for Environmental Pollution Control in Nigeria, 1991.
- National Environmental Protection (Management of Solid and Hazardous Wastes) Regulation, 1991.
- National Guidelines and Standards for Environmental Pollution Control in Nigeria, 1991.
- Public Health Law, 2006.
- National Guidelines on Environmental Management Systems, 1999.

6 The first three sections of this chapter follow closely and reproduce parts of the content of the Project Document for Environmentally Sound Management and Disposal of PCBs in Nigeria (UNDP/GEF, 2017a, pp. 13-15).

- Technical Guidelines and Rule Authorization for the Sound Management of Hazardous Materials and Impounded Goods, 2010.

4.2 Institutional Framework

Alongside available legal instruments to address environmental issues and chemicals management, there is a cross-sectoral national infrastructure, through relevant Ministries, Departments, and Agencies. There are four main organisations are identified for the management of chemicals in the country: the Federal Ministry of Environment (FMEnv); the Federal Ministry of Health (FMoH); and the Factory Inspectorate Division of the Federal Ministry of Labour and Productivity (FMoL).

The Federal Ministry of Environment has the primary responsibility for co-ordination of activities that protect the Nigerian environment from risks associated with chemicals as well as other environmentally-associated risks.

The Federal Ministry of Health has a stake due to its oversight responsibility on health matters in the country. Along these lines, risks of human exposure, either occupational ones, or through ingestion of foods, and the resulting effects on health, make the Ministry a key stakeholder.

The Factory Inspectorate arm of the Federal Ministry of Labour and Productivity is responsible for supervising workplaces where workers are exposed to certain harmful chemicals, ensuring that workers have safe working environments and, where relevant, protection from exposure to chemicals. The Ministry also ensures compliance by industries with the use of Personal Protective Equipment (PPE).

4.3 International Regulatory Framework for Hazardous Chemical Management

Due to the long-range transportation of Persistent Organic Pollutant (POPs), a global approach is necessary to agree on the control of these substances. In addition to the Stockholm Convention, Nigeria has commitments at the international and regional levels, and has ratified all the Multilateral Environmental Agreements on chemicals and waste. International conventions relevant to the sound management of POPs and other hazardous chemicals to which Nigeria is party include:

- **The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989)**

The Basel Convention is a global agreement which addresses the problems and challenges posed by the transboundary movement and management of hazardous wastes, including those consisting of, containing or contaminated with POPs. It was adopted on 22 March 1989 and came into force on 5 May 1992.

The Basel Convention uses a Prior Informed Consent procedure to control transboundary movements of waste, whereby hazardous waste cannot be shipped from one country to another without the consent of those countries involved, including countries of transit. The Convention has developed guidelines for managing wastes contaminated by chemicals in Annexes A and B of the

Stockholm Convention and recognises these guidelines as Best Available Techniques (BATs) and Best Environmental Practices (BEPs).

- **The Bamako Convention on the Control of Transboundary Movements of Hazardous Wastes within Africa (1991)**

This convention is the only regional convention on hazardous wastes. It was put together by the African Region with the inclusion of radioactive waste, which is missing in the Basel Convention. Nigeria has ratified the convention.

- **The Globally Harmonised System (GHS) of Classification and Labelling of Chemicals**

The GHS is a worldwide initiative to promote standard criteria for classifying chemicals according to their health, physical and environmental hazards. It uses pictograms, hazard statements, and the signal words "Danger" and "Warning" to communicate hazard information on product labels and safety data sheets in a logical and comprehensive way. The primary goal of GHS is better protection of human health and the environment by providing chemical users and handlers with enhanced and consistent information on chemical hazards.

- **The Strategic Approach to International Chemicals Management**

The International Conference on Chemicals Management held in February 2006 finalised and adopted the Strategic Approach to International Chemicals Management (SAICM). The SAICM is a global framework to improve chemicals management. It is a voluntary agreement supported by a high-level declaration and contains a toolkit of policies and activities aimed at raising the standards of chemicals management, particularly in developing countries. SAICM pulls together international bodies with responsibility for chemicals management and supports and enhances the global treaties that cover chemicals and hazardous waste. Nigeria is actively involved in SAICM activities.

4.4 GEF and UNDP Safeguard Policies

The GEF issued its *Policy on Agency Minimum Standards on Environmental and Social Safeguards* (GEF, 2015a) and the GEF *Policy on Gender Equality* (Ibid, 2017), which superseded the GEF *Policy on Gender Mainstreaming* (Ibid, 2012). The UNDP developed its *Social and Environmental Standards* (SES) (UNDP, 2014a) and its accompanying *Social and Environmental Screening Procedure* (SESP) (Ibid, 2016).

In 2011, the GEF Council required that all GEF Agencies[7] met the same standards that entities applying for accreditation as GEF Project Agencies.[8] Consequently, the GEF Council requested the GEF Secretariat to assess the extent to which GEF Agencies complied with its *Policy on*

7 A GEF Agency is: "Any one of the 10 institutions that have direct access to the GEF Trust Fund resources as of November 2010" (GEF, 2015b, p. 1).

8 A GEF Project Agency is: "Any institution that the GEF has accredited to receive GEF resources on behalf of countries to implement GEF-financed projects under the provisions of paragraph 28 of the Instrument apart from the ten GEF Agencies" (Ibid).

Agency Minimum Standards on Environmental and Social Safeguards, and its *Policy on Gender Mainstreaming* (GEF, 2013, p. 3). UNDP is a GEF Agency and, therefore, underwent this assessment.

As a result of the safeguards compliance assessment conducted by the GEF and the updates of the safeguard policies and procedures undertaken by UNDP largely in response to this assessment, the GEF Secretariat determined that UNDP's Social and Environmental Standards (SES) met all of the requirements of the GEF Safeguards Policy (GEF, 2014, pp. 4-5). Further, the GEF Secretariat concluded that, taken together, the UNDP *Gender Equality Strategy* (first published in 2008, and updated in 2014 and 2018), as well as other operational mechanisms implemented by this agency, namely the Programme and Operational Policies and Procedures (POPP), the Gender Marker tracking system on budgeting, the Results Oriented Annual Report (ROAR), and the Gender Steering and Implementation Committee (GSIC), made UNDP compliant with all of the requirements of the GEF *Policy on Gender Mainstreaming* (Ibid, 2013, p. 7).

The above means that as long as the Project "Environmentally Sound Management and Disposal of PBCs in Nigeria" complies with the requirements of UNDP's SES and its associated SESP, as well as UNDP's Gender Strategy and associated procedures, the Project will also be in observance of GEF's environmental, social and gender safeguard requirements.

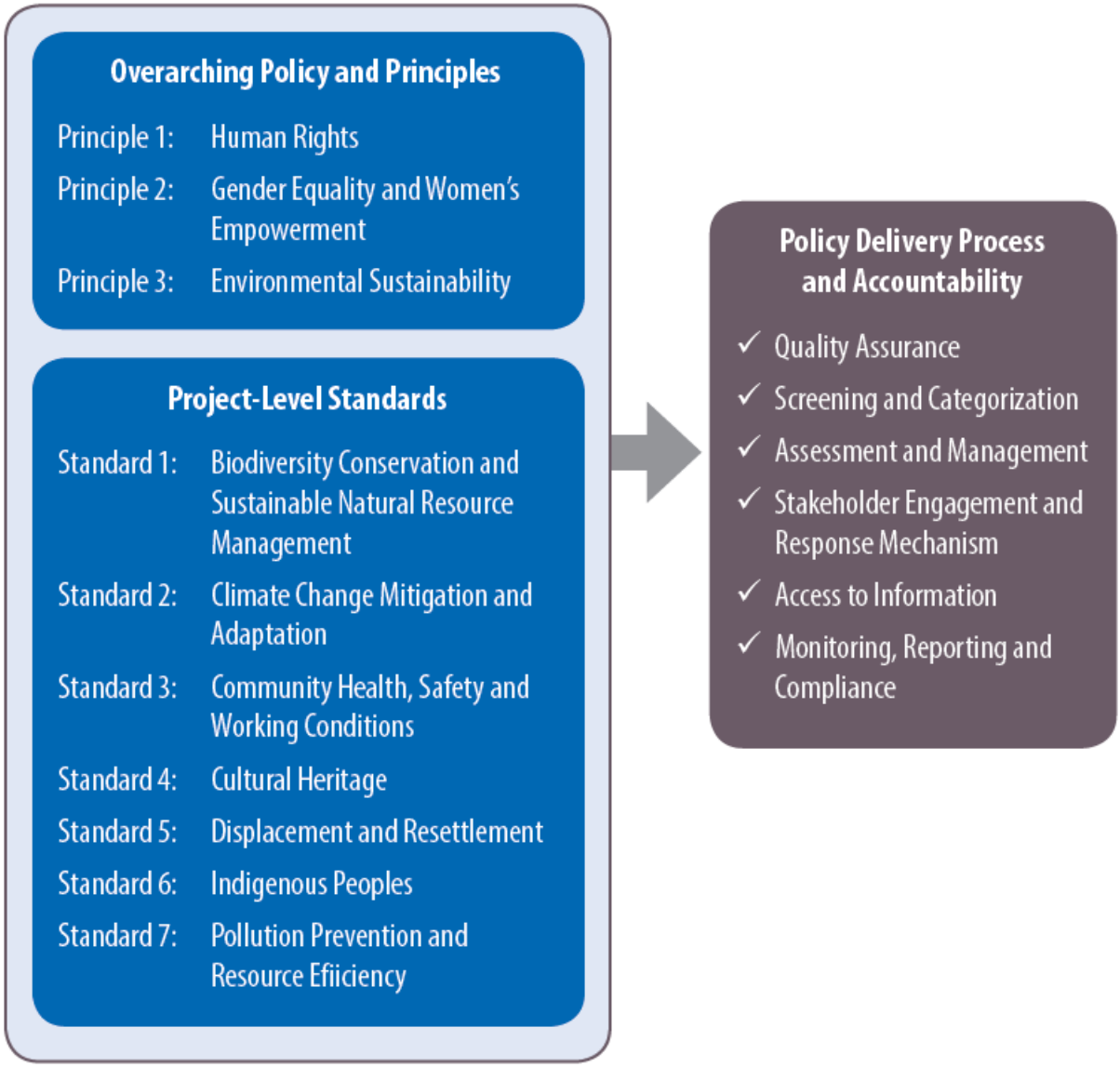
Figure 4.4 shows the key elements of UNDP's SES. As shown in this figure, screening and categorization of projects is one of the key policy delivery requirements. UNDP's Social and Environmental Screening Procedure (SESP) fulfills this requirement and provides policy guidance and tools to design and implement quality Projects and to address the requirements of UNDP's SES.

The objectives of the SESP are to:

- integrate the SES Overarching Principles in order to strengthen social and environmental sustainability;
- identify potential social and environmental risks and their significance;
- determine the Project's risk category (Low, Moderate, High); and
- determine the level of social and environmental assessment and management required to address potential risks and impacts.

The SES requires the disclosure of final social and environmental assessments and associated management plans for High Risk projects upon receipt of the study which, if undertaken as part of project as is the case with the present ESMF, should be diclosed before implementation of any activities that may cause adverse social and environmental impacts. Further, the final social and environmental assessment and associated management plan should be made available in an accessible location, as well as on the UNDP Country Office website.

Figure 4.4. Key Elements of UNDP's Social and Environmental Standards (SES)



5.0 POTENTIAL ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

This chapter provides an overview of the anticipated positive and negative environmental and social risks and impacts of the Environmentally Sound Management and Disposal of PCBs in Nigeria Project. The first section identifies the potential benefits of the Project.

The second section analyses the likely adverse risks and impacts of each of the Components that comprise the Project.

5.1 Potential Positive Impacts

The main positive contributions of the Project to the environmentally sound management of PCBs in Nigeria are as follows:

1. Substantial decrease in the risk of accidental leakage, spill and release of vapours from both in-service and off-line contaminated transformers and other electrical equipment, and the associated notable reduction in potential health and safety hazards to workers and communities and contamination of soil and water bodies, thanks to the decontamination of 1,500 metric tons of PCB-contaminated electrical equipment and disposal of 200 metric tons of pure PCB from transformers and capacitors.
2. The previous positive impacts are also anticipated with respect to the remaining PCBs that will not undergo processing during the implementation of the Project, thanks to the establishment of a treatment centre and the acquisition of decontamination and dechlorination systems under the Project, which will allow electrical utilities to complete the identification, treatment and disposal of contaminated equipment, oil and waste in an environmentally-sound manner using proven and cost-effective technologies demonstrably appropriate to the Nigerian context.
3. Significant reduction in the risk of accidental leakage, spill, release of vapours and cross-contamination with PCBs during the handling, transport and disposal of PCB-containing electrical equipment and wastes, and the consequent notable decrease in the likelihood of generating health and safety hazards to workers and communities and contamination of soil and water bodies, thanks to the wide-ranging capacity building, training and awareness raising activities included in the Project, as well as the update of the regulatory framework for hazardous waste management and the improvement of the existing PCB Management Information System.
4. Substantial savings in terms of preventing and minimising the medium- and long-term health costs of treating potentially affected electrical workers and community members living in close proximity to sites with contaminated equipment in operation or stored, as well as the cost of remediating contaminated storage sites, and soil and water bodies polluted due to accidental PCB releases. The Project will realise these cost savings by taking action in the immediate term to deal with a portion of the existing contaminated equipment, waste and sites and the environmental and social risks that they pose.
5. Generation of opportunities for the expansion of existing private business enterprises, or the development of new ones, as well as the creation and consolidation of job opportunities in the private and public sectors, associated with the different activities involved in the management of PCBs (i.e., transportation of contaminated equipment and wastes, recycling or reuse of recovered metals and mineral oils, treatment of contaminated equipment and wastes, etc.).

6. Regarding Nigeria's global and regional environmental obligations and objectives, the Project will help the country achieve global efforts pursued under the Stockholm Convention to control toxic chemicals in general, eliminate or reduce the release of POPs to the environment and manage PCB waste and PCB-contaminated equipment in an environmentally-sound manner, as well as obligations to address POPs under the Basel Convention and the Bamako Convention.

5.2 Potential Negative Risks

This section analyses the potential negative environmental and social risks and impacts posed by different Project Components. Of the five Components that comprise the Environmentally Sound Management and Disposal of PCBs in Nigeria Project, two are likely to have null to negligible risks. These are Component 1 (Institutional Capacity and Training on PCBs) and Component 5 (Monitoring, Learning, Adaptive Feedback and Evaluation).

The other three Project Components are likely to present adverse risks and impacts, some of which may be significant and, therefore, they will be the subject of more detailed description. These are Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories), Component 3 (Establishment of PCB Collection and Treatment Centres) and Component 4 (Environmentally Sound Disposal of Identified PCBs).

The following four subsections describe the potential negative risks and impacts of, respectively, Components 1 and 5, Component 2, Component 3 and Component 4.

5.2.1 Potential Negative Risks of Components 1 (Institutional Capacity and Training on PCBs) and 5 (Monitoring, Learning, Adaptive Feedback and Evaluation)

Components 1 and 2 are not likely to generate any noticeable adverse environmental or social risks or impacts, since they involve capacity building and training activities, as well as the improvement of an already existing web portal for information sharing and management.

The predominant environmental and social implications of the performance of all of the above activities are a slight increase in the demand for certain goods (e.g., notebooks, printing supplies, manuals, etc.) and public services (mainly electricity, and water and sanitation services). Since these goods and services are already under production, and because the growth in demand for them will not be significant, there will be no need to increase industrial production to such a point that pollution levels will rise noticeably or resource depletion would occur, or to exploit new sources of energy or water.

5.2.2 Potential Negative Risks of Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories)

The deficient implementation of some activities associated with the identification and inventory of PCBs and PCB-containing equipment can lead to deleterious impacts, in particular the sampling and analysis of oils, the testing of equipment, and the labelling of PCB-free and PCB-containing equipment.

The assessment of the potential and the magnitude of contamination of transformer oil with PCBs requires taking a sample from both operational and decommissioned equipment, and testing the sampled oil in an appropriately-equipped laboratory. During the collection of oil samples, there is a risk of accidental release of PCB-containing oil or vapours, or unintentional contamination of equipment used to take the sample.

In the event of an accidental spill, the magnitude of the impact of soil and/or water contamination will depend on the following main factors (Lebanese Republic, Ministry of Environment, 2015, p. 68):

- Volume of released oil.
- Level of contamination with PCBs of the spilled oil.
- Whether the spill occurred indoors or outdoors, and prevalent climatic conditions at the time of the spill.
- Type of flooring at the location of the spill, in particular whether it is an impermeable surface.
- Speed and type of intervention in response to the spill.
- Volume of contaminated waste produced as a result of the spill.
- Type of final disposal of the contaminated waste produced as result of the spill.

In the particular case of the Environmentally Sound Management and Disposal of PCBs in Nigeria Project, the most likely risk associated with Component 2 is exposure of workers to low concentration levels of PCBs and their potential health implications, which can be very severe, including liver damage, reproductive and developmental effects, and possibly cancer. Given the relatively low volume of oil in each piece of electrical equipment potentially contaminated with PCBs to be tested under the Project, the analysis of potential risks in this subsection will not consider major spills of PCB-contaminated oil onto soil and water bodies.

The collection of oil samples by untrained personnel with inadequate or insufficient provision of Personal Protective Equipment (PPE) may lead to direct exposure to potentially high concentrations of PCBs. This may produce a series of health symptoms depending on the route of exposure and volume of splashed liquids, including skin rashes, itching and burning, eye irritation, skin and fingernail pigmentations changes, disturbance in liver function and immune system, irritation of respiratory tract, headaches, dizziness, depression, memory loss, nervousness, fatigue and impotence (Ibid).

In addition to the above, the taking of oil samples from in-service transformers and capacitors by unskilled staff without proper PPE will expose them to the risk of electrical shock.

Further potential risks of the Project relate to public health impacts, as well as soil and water pollution, that may arise from the inadequate management of hazardous wastes contaminated with PCBs resulting from sampling and testing activities. In the case of public health risks, workers at electrical utilities, street scavengers and personnel involved in waste collection, transport, treatment and final disposal may be exposed through direct contact with the contaminated waste or inhalation of chemical by-products caused by PCB evaporation. The likely illnesses would be similar to those identified above for oil sampling and testing staff.

In the case of soil and water pollution, if the hazardous wastes enter the general municipal waste stream through street storage, collection and transport, treatment and final disposal, then the hazardous wastes may cross-contaminate domestic or industrial wastes. If PCB-contaminated wastes end up in municipal sanitary landfills, PCBs may be released by evaporation or leaching into ground water or soil.

5.2.3 Potential Negative Risks of Component 3 (Establishment of PCB Collection and Treatment Centres)

As indicated in Chapter 2.0 (Description of Project), this Component involves the construction of three new interim storage facilities whose locations were pre-selected during the preparatory phase of the Environmentally Sound Management and Disposal of PCBs in Nigeria Project. Two of these potential locations, the Neke Uno Interim Storage Site in Enugu State and the Epe Interim Storage Site in Lagos State have to be confirmed after further evaluation during the implementation phase of the Project. The third site, located at the SHESTCO (Sheda Science and Technology Complex) in the Federal Capital Territory, has been confirmed both as an interim storage facility and as the only treatment centre that will serve the whole Project. The storage facility at SHESTCO has yet to be developed, but the already existing Chemistry Centre within the Complex will host the treatment centre once its equipment and facilities undergo updating and upgrading with funding from the Project. The technical staff at the Chemistry Centre will also benefit from capacity building and professional development activities supported by the Project.

Anticipated environmental and social risks of this Component may occur during the construction as well as the operational phases of the proposed facilities. Since construction activities will involve building three new structures and upgrading an existing laboratory, all of which consist of a one-floor facilities of relatively small scale using traditional and proven construction methods, the potential risks of the construction phase are likely to be of minor to moderate magnitude, with predominance of the former; localised; temporary; reversible; and easily avoided, managed or mitigated with commonly available measures.

The potential negative risks of the construction and physical upgrading of facilities are: i) soil erosion; ii) water and soil pollution, and landscape degradation; iii) air pollution; iv) noise and vibration; v) traffic congestion, creation of hazardous driving conditions and obstruction of access; vi) interruption of water, telephone or internet services; vii) occupational health and safety hazards; and viii) community health and safety hazards.

Regarding the upgrade of the physical structures of the Chemistry Centre, the only likely minor risks are to workers' health and safety.

5.2.4 Potential Negative Risks of Component 4 (Environmentally Sound Disposal of Identified PCBs)

This Component involves a series of activities, namely: i) the dismantling, transport and disposal of contaminated transformers and capacitors still in use; ii) the removal, transport and disposal of contaminated off-line electrical equipment and PCB wastes stored at some sites within electrical utilities; and iii) the removal and disposal of contaminated soil and concrete at sites used for storing decommissioned transformers and capacitors contaminated with PCBs. If not managed well, all of these activities can pose adverse environmental and social risks that have the potential to be significant.

The dismantling of in-service transformers and capacitors identified as containing PCBs prior to their transport to the designated interim storage sites would include removal and disassembly of the equipment core and parts to facilitate their transport. The draining of the equipment would take place at a later stage.

The inadequate dismantling and transportation of contaminated electrical equipment may generate leaks, spills or fires that can contaminate adjacent soils and expose workers to inhalation of fumes, electrical shocks and burns. If spills occur, depending on their extent, the implementation of an already developed Emergency Preparedness and Response Plan may be necessary.

The inadequate implementation of the draining of contaminated oil from transformers, as well as the inappropriate packaging of dismantled equipment and collected contaminated fluids, may be the source of spills and the already noted associated environmental and social risks.

Poor management of interim storage sites for hazardous materials and contaminated equipment, in particular if they are not isolated from sensitive human and natural land uses, do not include impervious surfaces, and lack adequate fire prevention and spill response equipment, may also be the source of leakage and fires.

The transportation of dismantled equipment and contaminated fluids within and across sites may also cause spills and fires in case of accidents which, as noted above, can be compounded in case of inadequate packing.

The application of chemical and physical processes to contaminated equipment and oil during the operational phase of the treatment centre, as well as the treatment of contaminated oil by means of the mobile dichlorination unit that will be procured under the Project, may also be the source of accidental releases of hazardous fluids or vapours and the resultant associated adverse impacts noted above.

Sub-Section 5.2.2 above discusses other environmental and social risks associated with the handling of contaminated equipment and the transfer and storage of PCB-containing oils.

In relation to the removal of contaminated soil and concrete, it may lead to localised noise, vibrations and air emissions from construction equipment and vehicles, health and safety hazards

for construction workers, and potential soil and water contamination in case of inadequate elimination or disposal of the contaminated soil and concrete.

6.0 PREVENTION AND MITIGATION OF POTENTIAL ADVERSE ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

This chapter provides detailed measures to prevent and mitigate the anticipated negative environmental and social risks and impacts of the Environmentally Sound Management and Disposal of PCBs in Nigeria Project.

Following the approach used in Chapter 5.0 of identifying potential adverse risks and impacts according to each of the three Project Component likely to generate them (i.e., Component 2 - Inventory in 22 States Not Previously Covered by Other Inventories; Component 3 - Establishment of PCB Collection and Treatment Centres; and Component 4 - Environmentally Sound Disposal of Identified PCBs), this chapter also defines mitigation measures in relation to each of these Project Components.

The discussion of environmental and social management measures is as follows. The first section of the chapter summarises, by Component, the risks established in Chapter 5.0 and the respective pertinent measures elaborated later throughout the chapter. The next two sections describe the activities involved in the implementation of, respectively, Components 2 (Inventory in 22 States Not Previously Covered by Other Inventories) and 4 (Environmentally Sound Disposal of Identified PCBs), the likely environmental and social risks posed by each activity, and the details of the feasible applicable preventive and mitigating measures to address each risk.

In the case of Component 3 (Establishment of PCB Collection and Treatment Centres), since all of the activities associated with its execution relate to the construction of physical facilities, the discussion of potential risks and their mitigation is conducted in Table 6.1, Section 6.1 below, rather than in a separate section, as is the case with Components 2 and 4. The reason for this is to focus the description of Project risks and their management on Project Components and corresponding activities directly related to the management of PCBs (i.e., sampling, handling, transportation, destruction, disposal, etc.). The potential risks of the construction of very simple, small-scale building structures, so as those included in Component 3, are well understood and easily manageable with well-known, established, low-cost and low-tech measures included in Works Contracts for the construction of those facilities. The Works Contracts for the Establishment of PCB Collection and Treatment Centres will contain the mitigation measures specified in Table 6.1 as contractual obligations that the Contractor must fulfil. Likewise, the Supervision Contracts will include as contractual clauses the obligation of Supervising Engineers to verify the correct application of mitigation measures by Contractors.

6.1 Synthesis of Potential Negative Risks and Mitigation Measures

Table 6.1 provides a summary, structured according to Project Component, of the adverse risks posed by the Project and the pertinent mitigation measures to address them.

Table 6.1
Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures

PROJECT COMPONENTS	RISKS	MITIGATION MEASURES
Inventory in 22 States Not Previously Covered by Other Inventories	Occupational health and safety hazards, and pollution of soil and water, due to accidental release of PCB-contaminated oil during **sampling** of transformers	• A spill containment system (e.g., spill trays. absorbent material, etc.) shall be provided as a precaution in case of leakage. • Ensure that all spills are cleaned up immediately, and contaminated soil is disposed of adequately. • An Emergency Preparedness and Response Plan shall be developed and implemented, including treatment and transportation activities. • Workers shall be informed about potential health and safety risks, and instructed regarding safety measures and appropriate work procedures to follow. • Ensure that required personal protective equipment is supplied and used adequately.
Inventory in 22 States Not Previously Covered by Other Inventories and Environmentally Sound Disposal of Identified PCBs	Occupational health and safety hazards, and pollution of soil and water, due to accidental release of PCB-contaminated oil during: **- Temporary storage** of PCB-contaminated equipment and oil pending transportation after sampling activities conducted as part of inventory. **- Temporary storage** of PCB-contaminated equipment and oil previous to their treatment and disposal.	• PCB-contaminated electrical equipment pending decontamination shall be packaged and labelled properly, and placed on an impermeable surface and covered. • Security measures shall be taken against unauthorised removal of electrical equipment from treatment sites. • Ensure safe storage of PCB-contaminated equipment and oil pending transportation in especially-designated, enclosed areas, and only authorised persons shall have permit to enter these areas. • Temporary storage of all hazardous substances shall be in closed safe containers, labelled with details of composition, properties and handling information. Containers of hazardous substances shall be placed on an impervious surface, and fire-fighting equipment shall be provided in the area where the containers are stored. Containers and equipment shall be inspected regularly. • A list of all hazardous substances present on site shall be kept and the material safety data sheets for these substances shall be readily available and regularly updated. • All personnel on site who will be handling hazardous materials shall be trained about their proper use, handling and disposal.
Environmentally Sound Disposal of Identified PCBs	Community and occupational health and safety hazards, and pollution of soil and water, due to accidental release of PCB-contaminated oil during **transportation** of contaminated equipment and oil	• PCB-contaminated electrical equipment and oil shall be packaged and labelled properly during transportation. • Vehicles must be equipped with a spill clean-up kit. • Emergency Preparedness and Response Plan shall be developed and implemented, including treatment and transportation activities.
	Occupational health and safety hazards, and pollution of soil and water, due to accidental release of PCB-contaminated oil during **decontamination** of PCB transformers and other electrical equipment	• Decontamination activities shall be carried out only by trained personnel with adequate personal protective equipment. • Emergency Preparedness and Response Plan shall be developed and implemented, including treatment activities. • Workers shall be informed about potential health and safety risks, and instructed regarding safety measures and appropriate work procedures to follow.

Table 6.1
Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures

PROJECT COMPONENTS	RISKS	MITIGATION MEASURES
		• Ensure that required personal protective equipment is supplied and used adequately. • Provide safety signs in work areas. • All operations for decontamination of electrical equipment shall be implemented in covered and well-ventilated building. • A spill containment system shall be provided as a precaution in case of leakage. • Hazardous wastes generated due to decontamination activities shall be disposed of in a licensed facility.
	Occupational health and safety hazards, and pollution of soil and water, due to accidental release of PCB-contaminated oil during ongoing **treatment operations**, such as drainage, destruction, regeneration and refilling, as well as **treatment** of PCB-contaminated electric equipment and oil by mobile PCB decontamination technology	• The work area for draining and packaging shall be clearly marked with a physical barrier and only the personnel involved in the operation shall be allowed to enter the area. • Drained PCB-contaminated dielectric oil shall be stored in closed safe containers, labelled with details of composition, properties and handling information. Containers of hazardous substances shall be shall be placed on an impervious surface, and fire-fighting equipment shall be provided in the area where the containers are stored. Containers with liquids shall be packaged in containers separate from the transformer carcasses and capacitors. Containers and equipment shall be inspected regularly. • PCB-contaminated dielectric oil shall not be mixed with other oils. • After the draining of the transformers, all equipment shall be properly cleaned and all waste from the operation filled into drums and disposed of together with the drained liquid and transformer carcasses. • A spill containment system (e.g., spill trays. absorbent material, etc.) shall be provided as a precaution in case of leakage. • Ensure that all spills are cleaned up immediately, and contaminated soil is disposed of adequately. • Emergency Preparedness and Response Plan shall be developed and implemented, including treatment activities. • The treatment facility should have written instructions and procedures covering: - Reception, storage, draining and decontamination of PCB-containing transformers and oil, including safety procedures. - Clean up of packaging, vehicles, floors, curbing, wells, etc. - Inspection and supervision. - Fire safety and emergency plan. - All instructions and procedures shall be available to the staff and the authorities in English and, as applicable and depending on the region of the country where sites are located, instructions and procedures shall be provided to staff in Hausa, Yoruba or Igbo.

Table 6.1
Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures

PROJECT COMPONENTS	RISKS	MITIGATION MEASURES
	Health and safety hazards to communities located close to storage, treatment and decontamination sites	• Provision of site security to storage, treatment and decontamination sites, and installation of warning signage around these sites to prevent access to them by community members and unauthorised persons, and inform the public about presence of hazardous substances and wastes. • Conduct information and education activities with the community to raise awareness about the dangers of exposure to hazardous substances and wastes.
Establishment of PCB Collection and Treatment Centres	**Soil Erosion**: Loss, damage or disruption of soil, with possible introduction of sediments to watercourses, as a result of trenching and vegetation clearing.	• Early installation and regular maintenance of drainage and diversion structures, silt traps, etc; drainage outlets to discharge into vegetated areas if possible; vegetation along watercourses and drainage lines to be retained if possible. • Retention of topsoil for restoration (including tilling and revegetation) as soon as practicable. • Removed soil from trenching operations shall be used for backfilling. • Careful planning of timing of works (overall duration and seasonality, specially avoiding works during the rainy season if possible). • Clear demarcation on project drawings of vegetation to be affected. • Minimisation of cleared areas and soil disturbance, with revegetation as soon as feasible with species adapted to local conditions when applicable. • If the surface to be intervened is small, protection of erodible areas with mulch, and planting with protective vegetation once works are finished; preferably, execution of works during the dry season. • If the surface to be intervened is large, presentation of an adequate erosion and sedimentation control plan, specifying type of device to be applied, installation sequence and location; preferably, execution of works during the dry season.

Table 6.1
Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures

PROJECT COMPONENTS	RISKS	MITIGATION MEASURES
	Water and Soil Pollution, and Landscape Degradation: • Trenching and vegetation clearing may create exposed sites. Sediment-laden runoff from cleared areas could impact water quality of downstream watercourses. • Release of hazardous substances associated with construction and maintenance activities or with transport of materials (e.g., accidental spills and leaks), may lead to soil, surface or groundwater contamination. • Inefficient waste management during construction and maintenance activities may lead to inadequate disposal of solid (domestic and construction) and liquid wastes that may pollute soils and watercourses, and visually degrade natural and man-made landscapes.	• Train personnel on waste handling and segregation. • Segregated waste storage containers with appropriate signs (hazardous or non-hazardous) shall be provided at construction sites. • No garbage, refuse, oily waste, fuel, waste oil or removed/excess materials (e.g., asphalt, sidewalks, metal scrap, etc.) shall be discharged into drains, onto site grounds, natural areas or watercourses. • If feasible, reuse of removed/demolished materials (e.g., asphalt, sidewalks, metal scrap, etc.) or donation to local community. In addition, careful selection of adequate sites for final disposal of removed/excess materials not reused or donated. • Implementation of appropriate storage and containment areas (e.g., "bunded" area with impervious "polyliner" or similar) for both new and waste fuel, oil and hazardous materials to prevent and contain any spillage and leaks. • Prompt removal and safe disposal of soil contaminated with hydrocarbons. • Hazardous and oil waste shall be collected and disposed by licensed waste handlers. • Implementation of hazardous materials handling and control procedures (e.g., identify chemical products and store in storage area with restricted access, keep track of movement of each chemical, etc.). • Keep records of waste generation (i.e. type of waste; hazardous or non-hazardous; weight or volume; properties; destination; date; etc.). • Maintenance and cleaning of vehicles, trucks and equipment should take place offsite, and prohibition of vehicle washing in watercourses. • Toilet facilities shall be provided for construction workers to avoid indiscriminate defecation in nearby bush. See soil erosion above for control of water pollution due to released sediments from disturbed construction sites.
	Air Pollution: Dust and exhaust emissions from small-scale construction activities, and movement of construction vehicles and trucks may affect human health.	• Whenever dust generation at construction sites becomes a problem, water spraying to suppress dust shall be undertaken. • Truck drivers shall be sensitised on and ensure they observe speed limits on earth roads to reduce dust generation. • Contractors shall operate only well-maintained construction machinery, vehicles and trucks, and implement a routine maintenance program for all vehicles and trucks. • Engines of vehicles, trucks and earth-moving machinery shall be switched off when not in use.

Table 6.1
Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures

PROJECT COMPONENTS	RISKS	MITIGATION MEASURES
	Noise and Vibration: • Use of earth-moving equipment and heavy vehicles may generate noise and vibration. • Excessive noise can be a nuisance to local communities and businesses. • Vibration from compacting equipment may crack walls of structures adjoining work sites.	• Contractors shall implement best driving practices when approaching and leaving construction sites to minimise noise generation created through activities such as unnecessary acceleration and breaking. • Strict control of timing of activities within authorised working hours, including banning work at night. • Minimise noise levels and vibrations (e.g., sound insulation, select equipment with lower sound power levels, install acoustic enclosures for equipment, install suitable mufflers on engine exhausts and compressors components). See also air pollution above.
	Occupational Health and Safety Hazards: Occupational health and safety hazards during execution of construction works.	• Conduct a risk assessment of site safety hazards, and design and implement measures specific to identified hazards. • Train workers on safe work practices, and conduct toolbox talks. • Provide and enforce use of adequate Personal Protective Equipment (PPE) on site including, as applicable, hard hats, overalls, high-visibility vests, safety boots, gloves etc**.** • Put a system in place to track and respond to accidents, incidents, near misses and fatalities. • Except for areas secured by fencing, all active construction areas shall be marked with high-visibility tape, in particular open trenches, to reduce the risk of accidents involving workers, pedestrians and vehicles. • All open trenches and excavated areas shall be backfilled as soon as possible after cable laying and construction has been completed. • Implement good construction site "housekeeping" and control access to active construction sites. • Clear signage shall be used at construction sites. • For physical hazards due to falling objects when performing elevated and overhead work: – The area around which elevated work takes place shall be barricaded to prevent unauthorised access. Working under other personnel shall be avoided. – Hoisting and lifting equipment shall be rated and maintained, and operators shall be trained in their use. – Equipment and fall protection measures shall be used and implemented by individuals. – Ladders shall be used according to pre-established safety procedures (proper placement, climbing, standing, use of extensions). • For risk of fall when working at elevation:

Table 6.1
Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures

PROJECT COMPONENTS	RISKS	MITIGATION MEASURES
		– Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance and replacement of fall protection equipment; and rescue of fall-arrested workers, among others. – Establishment of criteria for use of 100 percent fall protection (typically when working over 2 meters (m) above the working surface). The fall protection system should be appropriate for the tower structure and necessary movements, including ascent, descent and moving from point to point. – Installation of fixtures on tower components to facilitate the use of fall protection systems. – Provision of an adequate work-positioning device system for workers. Connectors on positioning systems should be compatible with the tower components to which they are attached. – Safety belts shall be of not less than 16 millimetres (mm). – Ropes should be 5/8 inch (1.6 cm) in diameter, two-in-one nylon or material of equivalent strength. Rope safety belts should be replaced before signs of aging or fraying of fibres become evident. – When operating power tools at height, workers shall use a second (backup) safety strap. See also traffic congestion, creation of hazardous driving conditions and obstruction of access above.
	Community Health and Safety: • Community health and safety hazards during the execution of construction works and transportation of construction materials.	• Except for areas secured by fencing, all active construction areas shall be marked with high-visibility tape, in particular open trenches, to reduce the risk of accidents involving pedestrians, workers and vehicles. • All open trenches and excavated areas shall be backfilled as soon as possible after cable laying and construction has been completed. • Clear signage shall be used at construction sites. • Control of access to active construction sites shall be implemented.

Sources: Cabral, 2017, Annex III, pp. 4-8; UNIDO/GEF, 2017, pp. 18-27; and Lebanese Republic, Ministry of Environment, 2015, pp. 86-115.

6.2 Potential Negative Risks of Component 2 and Mitigation Measures[9]

The Project includes the inventory of electrical equipment potentially contaminated with PCBs in 22 states not previously covered by other inventories. The requirement to prepare a PCB inventory is regulated in Part II of Annex A of the Stockholm Convention, according to which each Party shall take action in accordance with the following priorities:

1. Make determined efforts to identify, label and remove from use equipment containing greater than 10 % PCB and volumes greater than 5 litres.
2. Make determined efforts to identify, label and remove from use equipment containing greater than 0.05 % PCB and volumes greater than 5 litres.
3. Endeavour to identify and remove from use equipment containing greater than 0.005% PCB and volumes greater than 0.05 litres.

The environmentally sound waste management of liquids containing PCB and equipment contaminated with PCB needs to be achieved by 2028. The implementation of a detailed inventory is an indispensable prerequisite for the achievement of the 2028 objective.

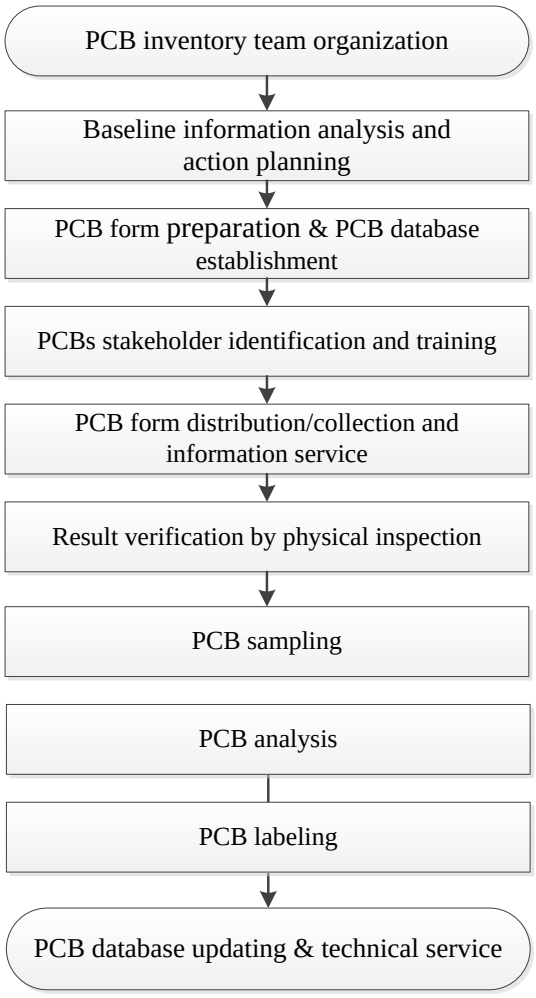
The development and implementation of a Standard Operating Procedure (SOP) are important elements to ensure the success of the PCB inventory project. For instance, the 10-step approach shown in Chart 6.2 is widely used in completing and updating inventories of liquids, equipment and the materials containing or contaminated with PCBs.

The discussion of the management of the potential environmental and social risks associated with Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories) comprises, firstly, a description of the specific activities involved in the inventory that have environmental and social implications and, secondly, an explanation of the feasible mitigation measures to respond to the potential risks and impacts associated with those activities.

The next four subsections describe, respectively the following four major activities involved in the inventory of electrical equipment potentially contaminated with PCBs and the adequate management measures for the risks posed by those activities: i) management of transformers prior to testing; ii) sampling of transformer and capacitor oils; iii) dismantling and packaging of PCB-contaminated transformers; and iv) storage of contaminated oil, equipment and materials prior to transportation.

9 This section follows closely the discussions in the following three sources, sometimes reproducing some of their contents: PCB Elimination Network, June 2016b, pp. 5-27; PCB Elimination Network, 2016a, pp. 1-26; and Lebanese Republic, Ministry of Environment, 2015, pp. 86-138;

Chart 6.2
10-Step Approach to Completing and Updating Inventories of PCB-Contaminated Liquids, Equipment and Materials



Source: Wagner, Urs K, 2010, p. 27.

6.2.1 Management of Transformers Prior to Testing

If there is reason to suspect that a transformer is potentially contaminated by PCB, all appropriate precautionary measures for handling it must be considered. The following steps should be followed:

1. Read the plate of the equipment carefully trying to identify all information including its brand name, serial number, voltage ratio, wattage, manufacturing date, origin and type of insulating fluid. It is very important to note the AC power (KVA or MVA), because it will be used to estimate the weight of the equipment and the oil, which will then be used to estimate costs for disposal.
2. If the equipment has a label indicating a name of insulating fluid different than mineral oil or silicone, look immediately at the list of brands and types of PCB included in "Annex C: PCB Trademarks" to the following publication: PCB Elimination Network (PEN). February 2016. *Polychlorinated Biphenyls (PCB) Inventory Guidance*. Geneva, Switzerland: United Nations Environment Programme (pp. 31-33).[10] This annex should contain the name of the fluid found in the equipment under review. If this is the case, the equipment is certain to contain pure PCB or be contaminated with PCB.
3. If the equipment has no label or if this does not indicate the type of dielectric fluid used, the strong and irritating characteristic odour of PCB and its density approximating 1.5 (compared to oils whose density is between 0.85 and 0.9) can give a first indication of the presence of PCB.
4. In both of the situations described above, the equipment should be isolated immediately and labelled.
5. Check the transformer cover and see if the seal has been opened and if a seal different than the original is used. If that is the case, the oil information on the label is not valid and it should be investigated if in the past the equipment underwent some kind of maintenance, during which the oil was extracted and re-filled with another oil. If that was the case, investigate where the extracted oil was put.
6. In parallel to this research, carry out a PCB test of the equipment using a Chlor-N-OIL kit. If the result is positive, it means that the oil contains chlorine. This is not yet a confirmation of PCB content. Indicate this on the label and put the equipment in a covered place, protected from water and sun and inform the staff in charge to not manipulate the equipment in any way.
7. Send an oil sample to a chemical laboratory where a gas chromatography analysis can be carried out to determine whether the oil contains PCB and, if so, to quantify the concentration and to find out whether you are dealing with pure PCB or contaminated oil. In the latter case, it means that the original fluid was extracted and the equipment re-filled with another fluid. In this case you should investigate where the original oil was put in order to safeguard it.
8. In both cases, if a PCB content of over 50 mg/kg is confirmed, the equipment containing the liquid should be properly labelled and transferred securely to the temporary storage facility. Alongside, all the information on this equipment must be incorporated into the database.
9. In the event that the result of the gas chromatography analysis shows a negative result for the presence of PCB, the equipment can be handled as a normal piece of equipment.

If the result shows a value below 50 mg/kg, although the equipment will be considered non-toxic, it should be kept under control for future maintenance activities. Due to the fact that PCBs are

[10] Available at: http://chm.pops.int/Implementation/PCBs/Guidance/tabid/665/ctl/

accumulative and not biodegradable, even small concentrations may accumulate in the future to higher concentrations and become a problem

6.2.2 Sampling of Transformer and Capacitor Oil

The methods commonly used to detect PCB in dielectric oil samples are the Chlor-N-OiI test kits and the L2000DX Analyser, which can be used to detect chlorine content in the sample. It is important to note that a positive result does not necessarily confirm the presence of PCB. In both cases, either for sampling or for implementation of the method, it is necessary to follow the manufacturer's specific instructions.

This activity entails very sensitive operations which, if not implemented properly, have the potential to generate significant negative impacts, namely accidental spills, increased production of PCB waste and occupational hazards. This section offers guidelines to limit the likelihood of occurrence of these impacts.

Teams conducting the sampling must be equipped with adequate Personal Protective Equipment (PPE) that will guarantee their safety throughout the process. These will include disposable coveralls, work aprons or kimonos, footwear covers, safety goggles and disposable PCB-resistant gloves (one pair per sample). If PCB comes into contact with the skin, immediately rinse the affected area with large amounts of running water. This may be done in a sink if the hands are the only portion of the body contacted or under a safety shower if the exposure area is more extensive. If large parts of the skin came in contact with PCB, please remove contaminated clothing while under the shower for a minimum of 15 minutes. Eyewash stations are required in areas where personnel can come into contact with corrosive liquids or gases.

A spill clean-up kit must be available with the sampling team for immediate intervention in case of accidental spills.

A sample from a transformer or system drain tap is assumed to be representative of the entire system. The volume of the sample to be collected depends mainly on the testing method adopted by the specialised laboratory that will analyse the sample.

Project and operation managers are expected to ensure accurate implementation of these guidelines to secure safety of the site. Teams performing the sampling must undergo thorough training based on the protocols described below and tested for competency prior to conducting the sampling on site. Any failure to comply with the protocol will endanger the whole team and put the site at risk of unnecessary contamination.

Below is a summary of the steps to follow during the sampling of transformers:

1. Before initiating the sampling, place a large metal tray under the drain tap to contain potential spills during the process.
2. Carefully open the drain tap and drain the adequate volume of sample into the sampling container. The type of containers to be used for the sample collection will be determined by the specialised laboratory.
3. When the adequate volume of sample is collected, close tightly the drain tap.

4. Seal the container and place it immediately into a labelled secondary sample container bag to prevent leaks.
5. Wipe spills from the sampling point.
6. Place equipment contaminated during the sample in a plastic bag for later disposal as PCB-contaminated waste or decontamination.
7. At the end of the sampling, the used metal tray will undergo decontamination in the event of contamination with the sampled oil.

In the case of capacitors, it is advisable only to sample capacitors that are already out of service. Capacitors still in service and manufactured before 1993 with missing information about the dielectric liquid have to be labelled as PCB-suspect equipment. In the event that no data are available, it is best to label these with a yellow 'suspect' label and take a sample at the end of their service life before 2025.

If there is a series of the same capacitors, it is usually sufficient to sample only two devices out of the series. If a designation is missing and relevant information from the manufacturer is not available, the only way to test the dielectric liquid is to drill a hole in the casing at the top or cut the isolator and retrieve an oil sample. This can be done by using a pipette (use only once). After this exercise, the capacitor is unusable and, as it is now damaged, it must be stored in appropriate containers.

In case of accidental spill while implementing the sampling protocol, an immediate spill response must be adopted to limit the impact of the spill. The list below summarises the steps that need to be followed during spill clean-up:

1. Immediately close the drain tap.
2. Spray absorbent material on the spilled liquid. The absorbent will allow solidification of the spilled oil which will provide a quick containment of the spill.
3. Collect the solidified material through the use of a disposable scoop.
4. Dispose of collected solidified material as well as any contaminated PPEs or equipment inside a labelled plastic bag for later disposal as PCB contaminated waste or decontamination.

Any contaminated material generated during the sampling of the transformer oil must be labelled carefully, similarly to the collected samples. Labelling will allow differentiation between PCB-contaminated and non-contaminated waste produced during the sampling and analysis once the laboratory results are obtained. Segregation of generated waste during this phase will allow reduction of the volume of contaminated waste that need to be dealt with later on. PCB-contaminated waste will be collected inside plastic bags to be contained inside specialised labelled and sealable drums and sent for interim storage. Subsection 6.3.2.4 discusses requirements for adequate packaging.

Regarding the sampling of PCB waste and contaminated sites, the *Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup* (USEPA, 1986) and the *Protocol for Sampling and Testing at PCB Storage Sites in Ontario* (Ministry of the Environment of Canada, 2000) can be used to collect a PCB waste sample that represents the concentration of PCB-contaminated soil, rocks, concrete and asphalt, wood, electrical cables, liquid and sludge stored in drums and piles.

6.2.3 Dismantling and Packaging of PCB-Contaminated Transformers

Once the presence of PCB has been confirmed in out of service equipment at a concentration over 50 mg/kg, it is essential to isolate it from PCB-free equipment, label it and safeguard it in a shelter to avoid cross-contamination and human exposure. Confirmation of PCB presence is through the analysis of samples at a specialised laboratory, usually by applying the technique of gas chromatography using electron capture detector or a more complex analysis, such as gas chromatography-mass spectrometry (GC-MS).

If the equipment does not leak and will be stored only temporarily, the oil can be left in it without draining, placing a drip tray below the equipment as a precaution. However, if the equipment has leaks or the storage time is unknown, the oil must be drained into containers in good condition, fully sealed and labelled in accordance to international regulations.

Concerns emerging from dismantling activities are mainly related to occupational safety and spill incidents.

6.2.3.1 Dismantling Activities

Only well-trained technicians can be assigned this task. The dismantling team needs to be equipped with adequate Personal Protective Equipment (PPE).[11] Prior to dismantling in-service equipment, isolation from electric supply must be ensured by a qualified electrician.

Dismantling of transformers must be initiated by separation of their relative bases prior to size reduction through removal of indispensable parts such as transformer fins to facilitate lifting and transfer to the interim storage site. Avoid breakage of the ceramic bushings on the capacitors during dismantling.

Since draining will be performed at the interim storage facility, special measures must be adopted to avoid spills during dismantling of equipment such as covering the site floors with impermeable lining. In the event of an accidental spill, immediate intervention is required to contain it, as described in Subsection 6.2.2 above.

6.2.3.2 Draining and Packaging of PCB-Contaminated Transformers

[11] The exact type and amount of PPE needed depend on the activity that will be carried out. If equipment or containers need to be handled for taking only a sample or doing an inspection, it is not necessary to wear the kimono and the mask mentioned below. If the activity involves the re-filling of oil, it is absolutely necessary to use all the accessories listed below. Required PPE may include:

- A protective apparel that resist penetration by most organic chemicals and toxic dusts, made of chemicals resistant materials such as TYVEK.
- Chemical splash goggles.
- Chemicals resistant gloves like nitrile disposable gloves, these are made of a copolymer that provide protection from chlorinated substances.
- Footwear that protects against chemicals.
- A protective mask of organic gases, vapours, solid and toxic particles (the recommended filter is A2P2).

During draining of PCBs, metal trays and absorbents should be used to collect any spill. The work area for draining and packaging shall be clearly marked with signs and separate from other areas with a physical barrier. Only the personnel involved in the operation shall be allowed to enter the draining and packaging area.

The transformers and contaminated oil shall be drained into United Nations (UN)-certified liquid drums[12] on pallets and the drums shall be packaged in a dedicated 20' box for transportation. Drums with liquids shall be packaged in containers separate from the transformer carcasses and capacitors. All containers used for packaging shall be UN-certified and comply with the relevant international agreements and local regulations for the transport of dangerous goods. The containers for transformer carcasses shall be filled with adequate absorbent material to prevent leakage during storage and transport. For the largest transformers, which cannot fit into a conventional container, leak-proof metal trays shall be used for the transport. The material inside the containers shall be lashed, secured and properly labelled. The containers shall also be labelled on each of their four sides and transported to the designated treatment site.

After the draining of the transformers, all equipment shall be properly cleaned and all waste from the operation filled into drums and disposed of together with the drained liquid and transformer carcasses. The drums and containers with transformers shall be stored in-doors (in a container) at the site until they are transported for decontamination.

6.2.4 Storage of Contaminated Oil, Equipment and Materials Prior to Transportation

The mixing and blending of wastes with a PCB content above a 50mg/kg with other materials solely for the purpose of generating a mixture with a PCB content at or below 50mg/kg is not environmentally sound. Nevertheless, the mixing or blending of materials before waste treatment may be necessary in order to enable treatment or to optimize treatment efficiency.

PCB-contaminated equipment and waste stored at the interim facilities will be considered as hazardous material and managed accordingly. Subsection 6.3.2 discusses the requirements for the location of storage facilities and the structural characteristics that these facilities should have.

Solid and liquid wastes contaminated with PCB may include:

1. Transformers containing or having contained mineral oil with PCB.
2. Parts of equipment containing or having contained PCB.
3. Containers that are no longer usable that used to contain PCB.
4. Washing liquids containing more than 0.5 ug/L of PCB.
5. Kits used to detect chlorine content or expired test kits. These are not only potentially contaminated with PCB, but may also contain other toxic chemicals such as mercury. Used and expired test kits should be eliminated using an appropriate treatment methodology.
6. Desiccant (sawdust, fabric), tools, gloves, clothes, rags, etc. These must be properly placed in plastic or metal containers, sealed and marked with the appropriate label for waste PCB.

[12] The UN has stipulated requirements for containers suitable for the transport of hazardous substances. These requirements specify certain characteristics that the packaging materials have to comply with. The coding used on the packaging is referred to as the UN-Certified Packaging System Code.

7. Soil and debris.

The requirements to ensure safe storage of contaminated oil, equipment and materials prior to transportation are as follows:

1. A list of all hazardous substances present on site shall be kept and the material safety data sheets for these substances shall be readily available. This list shall be provided to the project proponent and regularly updated.
2. Each receptacle containing dangerous goods shall be marked with the correct technical name of the substance it contains.
3. Incompatible materials shall not be placed in common containment.
4. There shall be adequate fire-fighting equipment at the storage area. Dry agent extinguishers shall be made available in quantities sufficient to control large fires.
5. Fill nozzles shall be kept within the isolated area when not in use and padlocked.
6. All outworkers handling hazardous materials shall keep appropriate spill clean-up material adjacent to storage and maintenance areas.
7. Safe storage and handling of hazardous substances shall comply with all pertinent Nigerian legislation.
8. All personnel on site who will be handling hazardous materials shall be trained about its proper use, handling and disposal.

6.3 Potential Negative Risks of Component 4 and Mitigation Measures[13]

The discussion of the management of the potential environmental and social risks associated with Component 4 (Environmentally Sound Disposal of Identified PCBs) comprises, firstly, a description of the specific activities involved in the implementation of this Component that have environmental and social implications and, secondly, an explanation of the feasible mitigation measures to respond to the potential risks and impacts associated with those activities.

The next four subsections describe, respectively the following four major activities involved in the environmentally sound disposal of PCBs and the adequate management measures for the risks posed by those activities: i) transportation of PCB-contaminated equipment, oil and materials; ii) storage of PCB-contaminated equipment, oil and materials; iii) response in case of accidents; iv) management of in-service transformers.

6.3.1 Transportation of PCB-Contaminated Equipment, Oil and Materials

The transport of PCB-contaminated equipment and wastes within the national territory requires a transport manifest. The manifest should include, at a minimum, the following information:

1. General information on the carrier:
   - Name of transporter or carrier
   - Address
   - Telephone

13 This section follows closely the discussions in the following three sources, sometimes reproducing some of their contents: PCB Elimination Network, June 2016b, pp. 5-27; PCB Elimination Network, 2016a, pp. 1-26; and Lebanese Republic, Ministry of Environment, 2015, pp. 86-138;

- Fax
- E-mail
- License plate of the transport vehicle (cab, container, truck)
- National license to transport hazardous materials if required by the country

2. Information on the owner of the PCB equipment and oil:
   - Name of the company or individual person
   - Address
   - Telephone
   - Fax
   - E-mail

3. Information on the person/company receiving the load:
   - Name of the company or individual
   - Address
   - Telephone
   - Fax
   - E-mail

4. Information on the cargo:
   - Type of equipment or container
   - Model
   - Serial number
   - KVA and voltage
   - Total weight (kg)
   - Volume of oil
   - If they are containers, indicate on its four side walls UN 2315 (PCB liquids), UN 3432 (PCB solids) and Class 9 (Marine pollutant) labels
   - PCB concentration (mg/kg) indicated on each piece of equipment and oil container, including the type of analysis applied

Following are the guidelines for the safe transportation of PCB-contaminated transformers, capacitors, oils and materials to avoid accidents and associated adverse impacts:

1. Road transport shall be limited to daylight outside rush hours and transport in bad weather shall be avoided.
2. Use of properly trained flagmen and road side signs, and coordinate with local authorities to adequately control local traffic flow.
3. Implement adequate warning and speed limit signage, and control traffic at least 500 m down- and up-gradient from storage and treatment sites.
4. All trucks entering or leaving storage and treatment sites shall have their trays suitably covered to prevent spillage of any material from the truck onto the road.
5. All vehicles being loaded or unloaded shall stand entirely within the site.
6. Prior to transportation of the hazardous wastes, all necessary Nigerian licenses and documentation shall be obtained.

7. Ideally, vehicles transporting wastes should be under surveillance at all times and shall be escorted by a firefighter vehicle.

6.3.2 Storage of PCB-Contaminated Equipment, Oil and Materials

The main objective of the adequate storage of PCB-contaminated liquids and waste before their treatment or final elimination is to prevent contamination of the environment and to avoid any exposure to humans. The storage process necessarily involves the implementation of safety and security measures to reduce the risks of spills and fires, including through natural disasters, which are the main threats during this process.

The following subsections describe: i) the criteria for selecting storage locations; ii) the structural conditions that storage facilities must meet; iii) the requirements for the storage of hazardous substances; iv) the requirements for containers and conditions for correct packaging; and v) the recommended content of Emergency Preparedness and Response Plans, and procedures to respond to leakages, spills and fires.

6.3.2.1 Criteria for Selecting Storage Locations

Selecting an appropriate location is the first step to ensure environmentally sound storage. The following criteria should be followed in choosing a site for storage:

1. Choose a site away from urban, commercial and industrial centres, especially where there are factories for food processing, medicines and easily combustible chemicals and potable water tanks, as well as recreational areas. Further, the facility should be installed away from potential sources of fire (high voltage cables, scrap shop, etc.).
2. The location should be distant from sensitive areas such as schools, hospitals, treatment plants, water bodies, natural protected areas, sensitive ecosystems, etc.
3. The ground should not be floodable or have a steep slope.
4. The location should not be prone to natural disasters.

6.3.2.2 Structural Conditions of Storage Facilities

The storage facilities should meet the following structural conditions:

1. The materials to be stored, such as electrical equipment, containers, etc., must be completely isolated from the physical environment (i.e., with no contact with soil, vegetation, water bodies, etc.).
2. It must have a spill containment system with a closed perimeter with the ability to contain spills with a volume greater than the liquid stored in equipment and containers.
3. A good ventilation system must be in place, sufficient to ensure adequate air circulation to prevent vapour accumulation of PCBs, taking into account that PCB vapours may be heavier than air. This system can be natural ventilation through openings in the top and bottom of the storage. If a mechanical ventilation system is in place, it should be controlled by a switch outside the storage area and be switched on a few minutes before entering it.
4. All materials used in the construction of the storage facility must be non-combustible.
5. The compound should be completely roofed and single-storied.

6. The floor must be made of concrete to carry the weight of the load to be deposited as well as the movement of heavy equipment and vehicles such as forklifts or cranes. The floor must be smooth, anticorrosive and it is recommended to seal it with an epoxy paint resistant to PCB, fire, liquids with a pH from 1 to 13 and a temperature of up to 70°C.
7. There should be no drain valves, floor drains, expansion joints, sewer lines, or other openings that would permit liquids to flow from the curbed area.
8. Channels or dams, including a collection tank at one end of the storage area, must be in place.
9. There must be an emergency exit.
10. A locker room with toilets, shower, eye wash and a sink for emergencies should be close to the storage area. Lockers for personal protective equipment and disposable clothing intended for workers who perform work on site must also be in place.
11. It is advisable to install a lightning conductor and an electrical system with adequate safety features.

6.3.2.3 Requirements for Storage of Hazardous Substances

These requirements are as follows:

1. The storage site must have all appropriate safety equipment, including equipment for fire protection and spill response.
2. Authorised personnel for entering and conducting work within the storage area must at all times wear personal protective equipment. They must also have at their immediate disposal means of communication such as a telephone, cellular or radio, to report any incident occurring in the area.
3. It must be prohibited to smoke, eat or drink within the storage area and to do work that involves a heat source.
4. All PCB-contaminated wastes must be stored in UN-certified drums or containers. The PCB-contaminated equipment and containers must be completely airtight, be in a well-ventilated place, protected from oxidizing or corrosive materials, stowed on pallets without being stacked, accessible, with easy access for inspection, preserving corridors for internal circulation of forklifts and easily visible identification.
5. The facility shall not be used for the storage of other waste.
6. Qualified trained staff should be assigned to be responsible for the storage area, including for the following activities:
   - daily inspections, which should be noted in a register;
   - recording equipment or containers that enter the collection centre with all information available;
   - recording of incidents such as spills, fires or other occurrences.
7. Security procedures should be placed in the facility in prominent locations.
8. Next to the storage area, there should be an area for the storage of materials, tools and equipment required to transfer PCB from one equipment or container to another.
9. The lighting of the storage area must be connected through a device that is outside the storage area.
10. There should be automatic fire detection sensors.
11. The entrance should be labelled with a sign indicating the prohibition of unauthorised personnel and indicating also the type of hazardous material stored.

12. The storage should be closed with a safety lock and telephone numbers for emergency calls should be available outside the storage area.
13. An Emergency Preparedness and Response Plan should be in place.
14. The facility should have written instructions and procedures covering:
    - Reception, storage, draining and decontamination of PCB-containing transformers and oil, including safety procedures.
    - Clean up of packaging, vehicles, floors, curbing, wells, etc.
    - Inspection and supervision.
    - Response to emergencies and accidents.
    - All instructions and procedures shall be available to the staff and the authorities in English and, as applicable and depending on the region of the country where sites are located, instructions and procedures shall be provided to staff in Hausa, Yoruba or Igbo.

6.3.2.4 Requirements for Containers and Conditions for Correct Packaging

The types of containers typically used to store liquid PCB waste are the same metal drums used to package new dielectric oils from factories. These drums are considered eligible to store such wastes as they have the certified UN code to meet the requirements for resistance, thickness of the metal and sealing. When reusing these containers to package oil contaminated with PCB, it is very important to check that they have the UN code and that they are in perfect condition, i.e. no bumps, no cracks, no corrosion and that they still have covers and seals. Once the liquid has been packaged, it must be ensured that the container is tightly capped and sealed and then labelled.

In the case of solid wastes containing PCB, such as transformers parts, cardboard, absorbent material, clothes, etc., they can be packaged in the same metal containers mentioned above and labelled in the same way.

Transformers that have been drained should be packaged, and tied together and fastened to the side walls of the container with tie downs to make sure there is no movement or tipping over during the shipment.

In the case of used test kits, two situations can occur:
1. The test was positive and therefore those parts of the kit that came in contact with the oil are contaminated and need to be stored and treated like PCB-suspected waste.
2. When the test was negative, the used kits should be treated as hazardous chemical waste and must be shipped to certified facilities for treatment, since the kits may contain components such as mercury. The same treatment applies for expired test kits.

6.3.3 Response in Case of Accidents

This subsection deals with the adequate response in case of accidents and emergencies. Firstly, it describes the recommended content of Emergency Preparedness and Response Plans. Secondly, is specifies how to react to leaks and spills of PCBs. Thirdly, it explains how to respond to fires involving PCBs.

6.3.3.1 Content of Emergency Preparedness and Response Plans

The potential risks that may arise in the case of storage of PCB liquids and equipment include spills, leaks, fires and explosions.

The Emergency Preparedness and Response Plan shall include the following:

1. Personnel that have been trained to respond appropriately to such emergencies and to carry out first aid.
2. Informed employees with the location of safety and rescue equipment available at the site. A clear Emergency Preparedness and Response Plan panel should be fixed at several locations to indicate the location of safety and firefighting equipment, the floor map and the evacuation directions, and exits and stairs with respect to the reader location (this should be written in languages understood by all workers).
3. Escape routes that have appropriate artificial lighting in case of failure of the main electricity supply, and that are distinctively and conspicuously marked by emergency exit signs of adequate size and in the pertinent language(s).
4. An efficient communication system with competent authorities that need to be notified in case of an emergency. A list of relevant telephone, cellular and/or radio numbers should be readily available. Relevant competent authorities include environmental governmental authorities, the fire brigade, the emergency medical services, hospitals, etc.
5. A response action plan, which should indicate the role and responsibilities of each person in an emergency situation.
6. An adequate alarm system, which has visual signs, such as flashing lights, and sound, such as sirens.
7. Provisions for the regular service and maintenance of all fire safety equipment and fixtures by a qualified Contractor.
8. Provisions for annual fire-fighting and leak checks training drills for the operating staff.
9. All required tools, equipment and materials for both the emergency and first aid, including the following:
    - Personal protective equipment (coveralls/aprons/ kimonos, goggles, gloves, shoes, masks).
    - Sufficient fire detectors (heat and smoke), adequate firefighting equipment (sprinklers, hoses, distinguishers, etc.) and automatic fire suppression where necessary.
    - First aid kits.
    - Eyewash and emergency shower.
    - Absorbent material (blankets, sawdust).
    - Brooms, shovels, rags.
    - Appropriate containers.
    - Pumps for repackaging.

6.3.3.2 Response in Case of Leaks and Spills

The response in case of leaks and spills must be immediate and include the following steps:

1. The staff must be equipped with clothing and accessories for personal protection.
2. Stop and contain the spill source, close a valve, seal the container and apply absorbent material in the venue.
3. Assess the magnitude of the emergency and proceed accordingly.

4. If the spill is on a flat surface, apply absorbent blankets or sawdust and then deposit blankets or sawdust with shovels into containers that are kept for this purpose.
5. If the spill was caught in a catchment tank, it needs to be pumped and deposited in containers.
6. After the spill has been cleaned up, samples need to be taken to check whether the soil has been contaminated. If the contamination persists on the surface, it might be necessary to remove the contaminated layer to subsequently eliminate it.
7. Personal protective equipment and accessories which are contaminated, need to be stored and disposed of as PCB waste.
8. All contaminated waste arising from the operation, such as water used for washing, absorbent material, clothing, debris, etc. should be placed in airtight containers for appropriate disposal or destruction.

6.3.3.3 Response in Case of Fire

PCBs can burn at high temperatures. Therefore, they should be stored separately from other flammable products such as oil, coal, wood products and compressed gases. During the combustion and pyrolysis of PCB, polychlorinated dibenzofurans (PCDFs) and polychlorinated dibenzodioxins (PCDDs) can be formed. These substances can be even more toxic than PCBs and they can be the main hazard from a PCB fire.

In the case of a fire, the following steps should be taken:
1. Immediately upon noticing the fire, set off the alarms.
2. Notify the appropriate authorities and fire-fighters.
3. The personnel assigned for this procedure must be equipped with clothing and accessories for personal protection.
4. Apply suitable extinguishing material on the fire. Materials used to extinguish fires involving PCB are chemical foam, carbon dioxide, nitrogen flow and dry chemicals. Water should not be used as it will become contaminated and increase clean-up costs.
5. All waste products of the fire should be cleaned similarly to the procedure detailed above for spills.
6. The personal protection clothes and accessories which are contaminated should be stored as PCB waste.
7. Clothes worn should not be washed for re-use, but should be considered as contaminated waste.
8. After the fire has been extinguished, the affected area should be closed off by fencing to perform the clean-up.

6.3.4 Management of In-Service Transformers

The main objectives of the proper handling of in-service equipment contaminated with PCB are to:
1. Prevent leaks and spills in the environment.
2. Protect the equipment from electrical failures that may cause accidents and fires. Fires can lead to the formation of dioxins and furans.
3. Protect the equipment from external fire hazards to which they may be exposed.
4. Maximise safety precautions for personnel in charge and when servicing the equipment.

If it has been confirmed that in-service equipment, which cannot be taken out of use, contains more than 50 mg/kg PCB and, it may continue in service provided that no leak occurs and that the following security measures are taken:

1. Label the equipment indicating its status.
2. Inform the personnel about the danger, the necessary precautions and measures to take in case of accidents.
3. Isolate the equipment and apply a tape indicating its hazard.
4. Put a drip tray or absorbent material barrier below the equipment, in case of leakage.
5. If leaks occur, the equipment needs to be taken out of use immediately, the oil removed and the equipment stored securely.
6. Check the impermeability of the equipment periodically.
7. Inspect regularly and thoroughly the concerned pieces of equipment for potential leaks or spills.

7.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

"An ESMF is an instrument that examines potential risks and impacts when a project consists of a series of sub-projects/activities or subsequent downstream implementation of policies, plans, programmes that cannot be fully assessed until the PPP [Policy, Plan and Programme] or sub-project/activities details have been identified (often later in the project cycle). The ESMF sets out the principles, rules, guidelines and procedures to ensure the social and environmental risks and impacts of the forthcoming but as yet unspecified activities are fully assessed and management measures in place prior to implementation. It contains measures and plans to avoid, reduce, mitigate and/or offset adverse risks and impacts, provisions for estimating and budgeting the costs of such measures, and information on responsibilities for addressing project risks and impacts" (UNDP, 2016b, p. 6).

This chapter develops the ESMF for the Environmentally Sound Management and Disposal of PBCs in Nigeria Project. It builds upon previous content presented throughout this report, in particular the chapters on: i) the description of the Project (Chapter 2.0); ii) the legal, policy and institutional framework for environmental and social management in Nigeria (Chapter 4.0); iii) the analysis of the potential environmental and social risks and impacts of the Project (Chapter 5.0); and iv) the identification of prevention and mitigation measures for the potential environmental and social risks and impacts (chapter 6.0). Further, the design of the ESMF takes into account the environmental and social management capacity present at the PMU.

The consideration of the aspects mentioned in the previous paragraph ensures that the ESMF is tailor-made to the characteristics of the Project, the specific regulatory and institutional framework of the country, the environmental and social requirements of UNDP and GEF, the Project's anticipated environmental and social risks and impacts, and the PMU's capacity and experience in environmental and social management. Further, the analysis conducted in Chapter 6.0 facilitates the structuring of the ESMF in terms of potential risks and impacts, as well as their management measures and strategies.

This chapter consists of nine sections. Section 7.1 explains the structure of the ESMF, establishes the steps involved in its application, indicates to which Project Component each step applies and identifies the tools to use in each step of the ESMF process.

Sections 7.2 to 7.5 describe the implementation tools, the institutional responsibilities and the supporting documentation associated with, respectively, each of the following ESMF steps: (i) Environmental and Social Screening; (ii) Environmental and Social Scoping; (iii) Incorporation of Environmental and Social Sustainability into Procurement Processes; and (iv) Environmental and Social Compliance Oversight.

Section 7.6 details the institutional arrangements for the implementation of the ESMF.

Section 7.7 describes the specific UNDP disclosure requirements regarding the ESMF

Section 7.8 explains the Grievance Redress Mechanism to address concerns or unaddressed impacts regarding the environmental and social performance of the Project.

Section 7.9 describes the Environmental and Social Training Plan aimed to develop the PMU's and implementing partners' capacity in order to effectively implement the ESMF.

7.1 Structure of ESMF

The examination of the potential environmental and social risks and impacts of the Project carried out in Chapter 5.0 concluded that only the activities included in Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories), Component 3 (Establishment of PCB Collection and Treatment Centres) and Component 4 (Environmentally Sound Disposal of Identified PCBs) are likely to generate adverse risks and impacts of concern. Therefore, the ESMF applies specifically to these three Components.

The ESMF for the Environmentally Sound Management and Disposal of PBCs in Nigeria Project comprises the following four steps:

1. Environmental and Social Screening.
2. Environmental and Social Scoping.
3. Incorporation of Environmental and Social Sustainability into the Procurement Processes.
4. Environmental and Social Compliance Oversight.

Each ESMF step: i) contains particular tools that serve as practical mechanisms to implement the respective step; ii) specifies institutional responsibilities for the application of each implementation tool; and iii) includes instruments and/or documents to assist in the application of the tools.

Table 7.1 provides an overview of the ESMF process. It establishes the steps involved in its application, indicates to which Project Component each step applies and identifies the tools to use in each step of the ESMF process.

Table 7.1
Overview of ESMF Process

ESMF Steps	Project Component to Which Step Applies	Tools to Implement Each ESMF Step	Documents/Tools to Support PMU in Implementation of ESMF Step
Environmental and Social Screening	Component 3 (Establishment of PCB Collection and Treatment Centres)	• Exclusion List for Interim Storage Sites (Annex I)	
Environmental and Social Scoping	Component 3 (Establishment of PCB Collection and Treatment Centres), specifically construction of three interim storage facilities		• Generic Terms of Reference for the preparation of the required ESIAs (Annex II). • Required Content for ESIAs in Nigeria (Annex II). • Flow Chart of the Environmental Impact Assessment Review Procedure in Nigeria (Annex II).

ESMF Steps	Project Component to Which Step Applies	Tools to Implement Each ESMF Step	Documents/Tools to Support PMU in Implementation of ESMF Step
Incorporation of Environmental and Social Sustainability into Procurement Processes	Component 3 (Establishment of PCB Collection and Treatment Centres), specifically construction of three interim storage facilities		• TOR for Contractor's Site-Specific ESMP and Site-Specific HSMP (Annex III). • Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures (Table 6.1, Section 6.1, Chapter 6.0, specifically rows corresponding to the Establishment of PCB Collection and Treatment Centres).
	Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories) and Component 4 (Environmentally Sound Disposal of Identified PCBs)		• Sections 6.2 and 6.3 of Chapter 6.0 which detail, respectively, for each activity included in Component 2 and Component 4, the risks posed by those activities and the pertinent management measures for the identified risks. These measures can be incorporated as contractual clauses for the operation of interim storage facilities, the treatment centre, the performance of inventories and corresponding analyses, and the packaging and transportation of PCB-contaminated oils, equipment and wastes
Environmental and Social Compliance Oversight	Component 3 (Establishment of PCB Collection and Treatment Centres), specifically construction of three interim storage facilities	• Environmental and Social Compliance Report (Annex IV).	
	Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories). Component 4 (Environmentally Sound Disposal of Identified PCBs)	• Checklist for Inspection of Facilities (Annex V).	

KEY: **ESIA**: Environmental and Social Impact Assessment. **ESMP**: Environmental and Social Management Plan. **HSMP**: Health and Safety Management Plan. **TOR**: Terms of Reference.

7.2 Environmental and Social Screening

Only the Establishment of PCB Collection and Treatment Centres, which is the sole Project Component that involves civil works, will undergo Environmental and Social Screening.

Based on the analysis of the potential environmental and social risks and impacts of the Project conducted in Chapter 5.0, Component 1 (Institutional Capacity and Training on PCBs) and Component 5 (Monitoring, Learning, Adaptive Feedback and Evaluation) will not be subject to further environmental and social screening because they present negligible or null environmental and social risks.

As explained also in Chapter 5.0, Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories) and Component 4 (Environmentally Sound Disposal of Identified PCBs) pose negative environmental and social risks that may manifest with high significance. The *Social and Environmental Screening Report* for the Project, included as Annex F to the Project Document (UNDP/GEF. 2017a), conducted the environmental and social risk screening of the Project and concluded that the level of significance of the risks of the activities included in Components 2 and 4 was high. Further, the Report found that the overall Project risk categorisation was high.

Given that the Project's *Social and Environmental Screening Report* already undertook the risk categorisation of the Project, which is the main purpose of the Environmental and Social Scoping of projects after the performance of the screening of project risks, this ESMF will not repeat these analyses but, rather, will focus on the definition of appropriate tools to address those risks under the last two steps of the ESMF. Instead, the Screening and Scoping steps of the ESMF will deal with the environmental and social risks of the construction activities involved in Component 3, which the *Social and Environmental Screening Report* did not address.

The only screening tool that will be applied to the potential locations for the siting of the PCB collection facilities is an Exclusion List. The Exclusion List for Interim Storage Sites[14] will identify sites that are not suitable as interim storage facilities because their development poses significant negative environmental or social risks, or involves unauthorised activities. As a result, these potential locations will be excluded from consideration as sites for an interim storage facility.

Annex I contains the Exclusion List. A positive response to any of the questions on the List will render the proposed site unsuitable to host an interim storage facility.

The Technical Officer at the PMU will complete the Exclusion List and the PMU Project Coordinator will give final approval to it.

7.3 Environmental and Social Scoping

According to Paragraph 18 (a) (v) of the Schedule [Section 12] to the Environmental Impact Assessment Act (Decree No. 86 of 1992), the construction of storage facilities for toxic and hazardous wastes is a "Mandatory Study Activity", indicating that it requires the preparation of an Environmental and Social Impact Assessment (ESIA) and, based on the results of the examination of the Assessment by the Environmental Authority, the issuance of an Environmental Assessment Certificate for its implementation. This requirement was confirmed during consultations held with the Environmental Impact Assessment (EIA) Division of the Environment Assessment Department at the Federal Ministry of Environment (FMEnv). Mandatory Study Activities are undertakings likely to generate significant environmental and social risks and impacts.

14 It has been decided that the treatment centre for the Project will be located at the already existing Chemistry Advanced Research Centre at SHESTCO and, therefore, the selection of the site for the treatment centre is not part of the Exclusion List. Further, the SHESTCO site does not exhibit any of the risk factors mentioned in the Exclusion List to warrant its elimination as a location for the treatment centre.

Based on the above, the Establishment of PCB Collection and Treatment Centres falls under the high-risk categorisation used in UNDP's Social and Environmental Screening Procedure and, therefore, the construction of these facilities requires an ESIA.

In view of the fact that both the national regulatory framework and the Social and Environmental Screening Procedure of UNDP, the GEF Agency for the Project, categorise this Project Component as high risk, this ESMF assigns the same risk categorisation to it. Further, this ESMF also specifies a corresponding requirement for the development of a separate ESIA for the construction of each of the three new interim storage facilities included in the Project which, subject to the results of the implementation of the steps involved in the ESMF and confirmation of their environmental and social suitability, will be tentatively located at three sites pre-identified during the preparation phase of the Project (i.e., Neke Uno Interim Storage Site, Enugu State; Epe Interim Storage Site, Lagos State; and the FCT [Federal Capital Territory] site at SHESTCO). At the time of preparation of this ESMF, the designs for the preliminary interim storage facilities at the three pre-identified sites were not available.

Since the treatment centre will be located at the already existing Chemistry Advanced Research Centre at SHESTCO, requiring only physical improvements to a laboratory to accommodate it for the treatment of PCBs (i.e., upgrades in the ventilation and electrical systems, construction of new walls, etc.), an ESIA is not necessary for the implementation of these improvements.

Annex II contains, respectively, the following three documents: i) generic Terms of Reference for the preparation of the required ESIAs; ii) the contents that ESIAs must include, as stipulated in the Environmental Impact Assessment Procedural Guidelines for the country (FMEnv, 2017); and iii) Flow Chart of the Environmental Impact Assessment Review Procedure in Nigeria (Ibid).

The PMU will undertake separately the procurement of each of the three required ESIAs under the oversight of UNDP.

As established in the Environmental Impact Assessment Procedural Guidelines (FMEnv, 2017), the FMEnv will: i) carry out the screening of project proposals and prepare the Initial Environmental Examination (IEE), which will assign the project into a risk category of I, II or III, with a Category I indicating the need for an ESIA (i.e., a "Mandatory Study Activity"); ii) review the Terms of Reference (TOR) submitted by the Project proponent with the scope of the proposed ESIA established in the IIE prepared by the FMEnv; iii) review the Draft ESIA; iv) review the Final ESIA incorporating the comments of the FMEnv on the Draft ESIA; and v) decide whether to grant a Certificate for the proposed project to procced with implementation.

7.4 Incorporation of Environmental and Social Sustainability into Procurement Processes

In the contracting processes for the construction of the three interim storage facilities, as well as for the operation of these facilities, the treatment centre, the performance of inventories and corresponding analyses, the packaging and transportation of PCB-contaminated oils, equipment and wastes, the ESMF introduces a series of tools aimed at including environmental and social sustainability measures into the respective procurement processes. In specific terms, these

instruments will ensure that contracts for both civil works and operation of facilities contain specific socio-environmental provisions of mandatory implementation.

The main tool for the works contracts for the construction of each of the three interim storage facilities is the inclusion in these contracts of the requirement that the selected Contractors must prepare a Site-Specific Environmental and Social Management Plan (ESMP), and a Site-Specific Health and Safety Management Plan (HSMP). Annex III includes the TORs for both Plans. An additional tool is the portion of Table 6.1, Chapter 6.0, on the identification of environmental and social risks, and the definition of mitigation measures for those risks corresponding to the Establishment of PCB Collection and Treatment Centres, which can support the development of the required Site-Specific Management Plans.

The tools for the contracts for the operation of interim storage facilities, the treatment centre, the performance of inventories and corresponding analyses, and the packaging and transportation of PCB-contaminated oils, equipment and wastes, are Sections 6.2 and 6.3 of Chapter 6.0. These two Sections conduct a detailed analysis for, respectively, Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories) and Component 4 (Environmentally Sound Disposal of Identified PCBs), of the activities involved in each, the risks posed by those activities and the pertinent management measures for the identified risks. Depending on the contract, the pertinent environmental and social management measures, including occupational health and safety measures, can be extracted from the applicable Section of Chapter 6.0 for incorporation as contractual clauses.

Since the PMU is responsible for the implementation of all the procurement processes related to the Project under the oversight of UNDP, it will also undertake the inclusion of the pertinent above-recommended environmental and social requirements as clauses in the applicable contracts (works, operation of facilities, transportation of hazardous wastes, etc.).

7.5 Environmental and Social Compliance Oversight

The last step of the ESMP consists of the verification of compliance with the environmental and social requirements established in works and operation contracts, as well as in the national environmental and social management framework.

There are two instruments to apply in this step. One is the Environmental and Social Compliance Report (see Annex IV), which is applicable to works contracts. According to the Environmental Impact Assessment Act (Decree No. 86 of 1992), the FMEnv is responsible for conducting the environmental and social field oversight of the implementation of projects that underwent the environmental and social review procedure led by the Ministry and obtained a Certificate. In particular, the Environmental Impact Assessment (EIA) Division of the Environment Assessment Department at FMEnv will conduct the field oversight with, to the extent possible, support from the Technical Officer of the PMU. The purpose of the Environmental and Social Compliance Report is to facilitate the field oversight function. The recommended periodicity of field inspection of each construction site is weekly, which may be increased or decreased based on the level of socio-environmental performance on each site. The respective Contractor and Supervising

Engineer are responsible for, correspondingly, implementing and supervising the implementation of environmental and social mitigation and monitoring measures included in Works Contracts.

The Environmental and Social Compliance Report contains: i) the non-compliances identified and impacts detected during the field visit (based on a predetermined series of questions); ii) a brief description of each non-compliance and impact, including the locations where impacts occur; iii) a summary of recommended actions to address each non-compliance and impact; and iv) the status of implementation of previously suggested actions to address non-compliances or impacts. In addition, the report includes, as applicable, supporting documentation and photographs as evidence of the non-compliances or impacts found. Further, the report allows the prioritisation of remedial actions to follow-up in future oversight visits, based on the seriousness of the non-compliances and impacts detected.

The second implementation tool of this ESMF step is the Checklist for Inspection of Facilities (see Annex V), which is applicable to the operation of interim storage facilities, the treatment centre, the performance of inventories and corresponding analyses, and the packaging and transportation of PCB-contaminated oils, equipment and wastes. The Checklist is structured according to the two pertinent Project Components (i.e., Inventory in 22 States Not Previously Covered by Other Inventories, and Environmentally Sound Disposal of Identified PCBs), the corresponding activities that raise environmental and social concerns and the specific issues to inspect associated with each activity.

Based on the environmental and social regulatory framework of Nigeria, the agencies responsible for inspecting facilities associated with the management of hazardous substances are the Inspection and Enforcement Department at the Environmental Standards and Regulations Enforcement Agency (NESREA), which is attached to the FMEnv and the Inspectorate Department at the Federal Ministry of Labour and Employment. In meetings held with representatives of these two agencies, they expressed a willingness to perform inspections of the facilities associated with the Project.

7.6 Institutional Arrangements for ESMF Implementation

Table 7.6 details the institutional arrangements for the implementation of the ESMF process, specifying institutional responsibilities in relation to each step of the ESMF.

Table 7.6
Overview of ESMF Process and Institutional Arrangements for Its Implementation

ESMF Steps	Project Component to Which Step Applies	Tools to Implement Each ESMF Step	Documents/Tools to Support PMU in Implementation of ESMF Step	Institutional Responsibilities						
				PMU	UNDP	EIA Division (FMEnv)	NESREA (FMEnv)	Inspectorate Department (FMoL)	Contractor	Supervising Engineer
Environmental and Social Screening	Component 3 (Establishment of PCB Collection and Treatment Centres)	• Exclusion List for Interim Storage Sites (Annex I)		Applies Exclusion List and drops from consideration sites that present risk factors mentioned on List						
Environmental and Social Scoping	Component 3 (Establishment of PCB Collection and Treatment Centres), specifically construction of three interim storage facilities		• Generic Terms of Reference for the preparation of the required ESIAs (Annex II). • Required Content for ESIAs in Nigeria (Annex II). • Flow Chart of the Environmental Impact Assessment Review Procedure in Nigeria (Annex II).	Undertakes separately the procurement of each of the three required ESIAs.	Oversees procurement of each of the three required ESIAs	Carries out screening of project proposals and prepares IEE. Reviews TOR submitted by Project proponent with scope of proposed ESIA. Reviews Draft ESIA. Reviews Final ESIA. Decides whether to grant a Certificate for proposed project to procced with implementation				
Incorporation of Environmental and Social Sustainability into Procurement Process	Component 3 (Establishment of PCB Collection and Treatment Centres), specifically construction of three interim storage facilities		• TOR for Contractor's Site-Specific ESMP and Site-Specific HSMP (Annex III). • Summary of Potential Adverse Environmental and Social Risks, and Mitigation Measures (Table 6.1, Section 6.1, Chapter 6.0, specifically rows corresponding to the Establishment of PCB	Includes in Works Contracts clauses for Site-Specific ESMP and Site-Specific HSMP						

ESMF Steps	Project Component to Which Step Applies	Tools to Implement Each ESMF Step	Documents/Tools to Support PMU in Implementation of ESMF Step	Institutional Responsibilities						
				PMU	UNDP	EIA Division (FMEnv)	NESREA (FMEnv)	Inspectorate Department (FMoL)	Contractor	Supervising Engineer
			Collection and Treatment Centres).							
	Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories) and Component 4 (Environmentally Sound Disposal of Identified PCBs)		• Sections 6.2 and 6.3 of Chapter 6.0 which detail, respectively, for each activity included in Component 2 and Component 4, the risks posed by those activities and the pertinent management measures for the identified risks. These measures can be incorporated as contractual clauses in contracts for the operation of interim storage facilities, the treatment centre, the performance of inventories and corresponding analyses, and the packaging and transportation of PCB-contaminated oils, equipment and wastes	Includes mitigation measures defined in Sections 6.2 and 6.3 as contractual clauses in contracts for the operation of interim storage facilities, the treatment centre, the performance of inventories and corresponding analyses, and the packaging and transportation of PCB-contaminated oils, equipment and wastes. Undertakes the procurement of above-mentioned operation contracts.	Oversees procurement of operation contracts.					
Environmental and Social Compliance Oversight	Component 3 (Establishment of PCB Collection and Treatment Centres), specifically construction of three interim storage facilities	• Environmental and Social Compliance Report (Annex IV).		To the extent possible, participates in joint environmental and social field oversight visits with EIA Division		Undertakes environmental and social field oversight of implementation of management measures by Contractors.			Implements environmental and social mitigation and monitoring measures included in Works Contract.	Supervises implementation by Contractor of environmental and social mitigation and monitoring measures
	Component 2 (Inventory in 22 States Not Previously Covered by Other Inventories) Component 4 (Environmentally Sound Disposal	• Checklist for Inspection of Facilities (Annex V).		To the extent possible, participates in joint inspections of facilities with NESREA and Inspectorate Department			Undertakes inspections of facilities to verify compliance with environmental and social requirements included in	Undertakes inspections of facilities to verify compliance with occupational health and safety requirements	Implements environmental, social, health and safety requirements in operation contracts and national regulations	

ESMF Steps	Project Component to Which Step Applies	Tools to Implement Each ESMF Step	Documents/Tools to Support PMU in Implementation of ESMF Step	Institutional Responsibilities						
				PMU	UNDP	EIA Division (FMEnv)	NESREA (FMEnv)	Inspectorate Department (FMoL)	Contractor	Supervising Engineer
	of Identified PCBs)						operation contracts and national regulations	included in operation contracts and national regulations		

KEY: **ESIA**: Environmental and Social Impact Assessment. **ESMF**: Environmental and Social Management Framework. **ESMP**: Environmental and Social Management Plan. **FMEnv**: Federal Ministry of Environment. **FMoL**: Federal Ministry of Labour and Employment. **HSMP**: Health and Safety Management Plan. **IEE**: Initial Environmental Examination. **NESREA**: Environmental Standards and Regulations Enforcement Agency. **PMU**: Project Management Unit. **TOR**: Terms of Reference. **UNDP**: United Nations Programme.

7.7 ESMF Disclosure Requirements

UNDP' Social and Environmental Standards (SES) require the disclosure of final social and environmental assessments and associated management plans for High Risk projects upon receipt of the study which, if undertaken as part of project as is the case with the present ESMF, should be diclosed before implementation of any activities that may cause adverse social and environmental impacts. Further, the final social and environmental assessment and associated management plan should be made available in an accessible location, as well as on the UNDP Country Office website.

Based on the above, the present ESMF will be disclosed on the websites of both the PMU and UNDP Nigeria Country Office.

7.8 Grievance Redress Mechanism (GRM)

The Grievance Redress Mechanism (GRM) provides a formal avenue for affected individuals or groups to engage with the Project implementers or sponsors on issues of concern or unaddressed impacts. It aims to manage and satisfactorily respond to the complaints of individuals or groups of people regarding the environmental and social performance of the Project.

Grievances and concerns may take the form of specific complaints for damages/injury, concerns about routine project activities, or perceived incidents or impacts. The Mechanism ensures that: i) the basic rights and interests of every person or group affected by poor environmental performance or social management of the project are protected; and ii) the concerns of impacted people arising from the poor performance of the Project during the phases of design, construction and operation activities are effectively and timely addressed.

Complaints and concerns should be addressed promptly using an understandable and transparent process that is culturally appropriate and readily acceptable to all segments of affected communities, at no cost and without retribution. Mechanisms should be appropriate to the scale of impacts posed by a project.

The GRM for the Project will be managed by a Grievance Redress Committee (GRC) formed by, at a minimum, PMU's Technical Officer, a representative of the regional FEMEnv office in the state where the complaint originates and a representative of the local government of the area where the complaint is filed. None of the members of the Committee should have a conflict of interest involving any complaint lodged. The Committee should have female representation.

Requirements for the GRM are as follows: i) the grievance redress process must not impose any cost to those raising the complaint; ii) concerns arising from Project implementation must be adequately addressed in a timely manner; and iii) participation in the grievance redress process must not preclude the pursuit of legal remedies under the laws of the Federal Republic of Nigeria.

The GRM comprises the following four stages: i) reception; ii) investigation and inquiry; iii) response; and iv) follow up and close out. Table 7.7 details the stages and corresponding steps and timeframes of the GRM for the Project, as well as the forms to use in the GRM process.

Table 7.7
GRM Stages, Steps, Timeframes and Forms

Stage	Step	Description	Time Frame
Reception	Identification of complaint or concern	Complaint or concern lodged face to face or by phone; letter or email, or recorded during public/community interaction or consultation. Annex VI includes the Grievance Registration Form, which will be used to formally lodge a complaint by the affected party before the Grievance Redress Committee.	1 Day
Investigation and Inquiry	Complaint or concern assessed and logged	Significance assessed and grievance recorded in the Grievance Logbook, whose format is attached as Annex VII. Significance criteria are as follows: • Level 1: one off event. • Level 2: complaint is widespread or repeated. • Level 3: any complaint (one off or repeated) that indicates breach of Nigerian law or provision of the ESMF.	4-7 Days
	Complaint or concern is acknowledged	Acknowledgement of complaint or concern through appropriate medium.	7-14 Days
Response	Development of response	• Complaint or concern assigned to appropriate party for resolution. • Response development with input from Grievance Redress Committee and affected person or group.	4-7 Days 10-14 Days
	Response signed off	Redress action approved by Grievance Redress Committee. The Grievance Decision Form, attached as Annex VIII, will be used to formally record the decision of the Committee.	4-7 Days
	Implementation and communication of response	Redress action implemented and update of progress on resolution communicated to complainant.	10-14 Days
Follow Up and Close Out	Complaints response	Redress action recorded in Grievance Logbook (see Annex VII). Confirmation with complainant that complaint can be closed or determination of what follow up is necessary.	4-7 Days
	Close grievance	Recording of final sign off of grievance. If grievance cannot be closed, return to second step (Complaint or concern assessed and logged) or refer to recommend third-party arbitration or resort to court of law.	4-7 Days

The GRM will produce monthly and quarterly reports on the status of processing of all complaints and concerns received using the format provided in Annex IX.

7.9 Environmental and Social Training Plan

The effective implementation of the ESMF requires that PMU staff is knowledgeable about the ESMF process and how to adequately apply the tools under its responsibility associated with each step of the ESMF. Further, it requires that Project implementing partners, in particular NESREA, the EIA Division of FMEnv and the Inspectorate Department of FMoL have, as applicable, the Environmental, Social, Health and Safety (ESHS) management capacity to satisfactorily implement the ESMF steps under their responsibility, which is the main aim of the present Training Plan.

The Training Plan consists of practical, hands-on modules delivered in a workshop format, tailor-made to different target audiences mentioned above. The training modules will be ideally taught by either a specialised consulting firm or a qualified team composed of an international Environmental Consultant and an international Social Consultant with practical experience in ESHS assessment and management, field mitigation and capacity building in the field of hazardous chemicals, in particular Persistent Organic Pollutants (POPs) and more specifically PCBs. It is recommended that participating entities co-sponsor the Training Plan and provide a certificate to participants in the different target audiences who complete the corresponding modules. Table 7.8 contains the suggested Training Plan.

Table 7.8
Suggested Training Plan

MODULE	TARGET AUDIENCE	DURATION
Assessment and management of ESHS risks and impacts of POPs, in particular PCBs in the electrical sector: • Module 1: Potential ESHS risks and impacts. • Module 2: Mitigation of ESHS risks and impacts. • Module 3: Field oversight of ESHS risks and impacts (practical module with site visit).	PMU. NESREA. EIA Division of FMEnv. Inspectorate Department of FMoL.	3 days.

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ANNEX I

Exclusion List for Interim Storage Sites

EXCLUSION LIST FOR INTERIM STORAGE SITES

Question	Answer	
	Yes	**No**
Is proposed site located within or close to any of the following legally protected or ecologically sensitive areas? • Natural protected area (e.g., national park, forest reserve, bird sanctuary, etc.). • Sensitive ecosystem (e.g., wetland, primary forest, mangrove forest, etc.). • Area of high biodiversity, or with endogenous or endangered flora or fauna.		
Will development of the proposed site cause significant conversion or degradation of critical natural habitats, such as pristine natural forests or wetlands?		
Is proposed site located close to a high-density urban, industrial or commercial centre?		
Is proposed site located close to sensitive land uses, such as institutional (in particular schools and hospitals), recreational and industrial (in particular food processing, medicine factories and installations that produce combustible chemicals), or close to potential sources of fire (high voltage cables, scrap shop, etc.)?		
Will development of the proposed site cause significant conversion or degradation of critical natural habitats, such as pristine natural forests or wetlands?		
Will development of the proposed site cause significant socioeconomic impacts involving involuntary resettlement (i.e., displacement of large number of houses or building structures; significant loss, denial or restriction of access to natural resources, land, crops and other economic assets; or significant loss of sources of income or means of subsistence)?[1]		
Will development of the proposed site include activities involving harmful or exploitative forms of forced labour[2] or child labour[3]?		

NOTE: A positive response to any of the above questions will render the proposed site unsuitable to host a collection facility.

1 The threshold for defining whether or not a subproject will cause significant socioeconomic impacts involving involuntary resettlement follows the criteria set in the World Bank Operational Policy on Involuntary Resettlement (OP 4.12) for establishing when a Resettlement Plan is required, instead of an Abbreviated Resettlement Plan. Therefore, socioeconomic impacts will be considered significant when more than 200 people are displaced by the subproject and/or over 10% of their productive assets are lost (WB, 2011b, p. 5 and p. 7).

2 Forced labor means all work or services not voluntarily performed, that is, extracted from individuals under threat of force or penalty.

3 Child labor means the employment of children whose age is below the host country's statutory minimum age of employment or employment of children in contravention of International Labor Organization Convention No. 138 "Minimum Age Convention" (www.ilo.org).

ANNEX II

Generic TOR for ESIAs, Required Content of ESIAs in Nigeria and Environmental Review Procedure in Nigeria

Generic TOR for ESIAs (UNDP, 2016b, pp. 33-34)

An ESIA report should include the following major elements (not necessarily in the following order):

(1) Executive summary: Concisely discusses significant findings and recommended actions.

(2) Legal and institutional framework: Summarizes the analysis of the legal and institutional framework for the project, within which the social and environmental assessment is carried out, including (a) the country's applicable policy framework, national laws and regulations, and institutional capabilities (including implementation) relating to social and environmental issues; obligations of the country directly applicable to the project under relevant international treaties and agreements; (b) applicable requirements under UNDP's SES; and (c) and other relevant social and environmental standards and/or requirements, including those of any other donors and development partners. Compares the existing social and environmental framework and applicable requirements of UNDP's SES (and those of other donors/development partners) and identifies any potential gaps that will need to be addressed.

(3) Project description: Concisely describes the proposed project and its geographic, social, environmental, and temporal context, including any offsite activities that may be required (e.g., dedicated pipelines, access roads, power supply, water supply, housing, and raw material and product storage facilities), as well as the project's primary supply chain. Includes a map of sufficient detail, showing the project site and the area that may be affected by the project's direct, indirect, and cumulative impacts (i.e. area of influence).

(4) Baseline data: Summarizes the baseline data that is relevant to decisions about project location, design, operation, or mitigation measures; identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions; assesses the scope of the area to be studied and describes relevant physical, biological, and socioeconomic conditions, including any changes anticipated before the project commences; and takes into account current and proposed development activities within the project area but not directly connected to the project.

(5) Social and environmental risks and impacts: Predicts and takes into account all relevant social and environmental risks and impacts of the project, including those related to UNDP's SES (Overarching Policy and Principles and Project-level Standards). These will include, but are not limited to, the following:

(a) Environmental risks and impacts, including: any material threat to the protection, conservation, maintenance and rehabilitation of natural habitats, biodiversity, and ecosystems; those related to climate change and other transboundary or global impacts; those related to community health and safety; those related to pollution and discharges of

waste; those related to the use of living natural resources, such as fisheries and forests; and those related to other applicable standards.[18]

(b) *Social risks and impacts*, including: any project-related threats to human rights of affected communities and individuals; threats to human security through the escalation of personal, communal or inter-state conflict, crime or violence; risks of gender discrimination; risks that adverse project impacts fall disproportionately on disadvantaged or marginalized groups; any prejudice or discrimination toward individuals or groups in providing access to development resources and project benefits, particularly in the case of disadvantaged or marginalized groups; negative economic and social impacts relating to physical displacement (i.e. relocation or loss of shelter) or economic displacement (i.e. loss of assets or access to assets that leads to loss of income sources or means of livelihood) as a result of project-related land or resource acquisition or restrictions on land use or access to resources; impacts on the health, safety and well-being of workers and project-affected communities; and risks to cultural heritage.

(6) Analysis of alternatives: systematically compares feasible alternatives to the proposed project site, technology, design, and operation – including the "without project" situation – in terms of their potential social and environmental impacts; assesses the alternatives' feasibility of mitigating the adverse social and environmental impacts; the capital and recurrent costs of alternative mitigation measures, and their suitability under local conditions; the institutional, training, and monitoring requirements for the alternative mitigation measures; for each of the alternatives, quantifies the social and environmental impacts to the extent possible, and attaches economic values where feasible. Sets out the basis for selecting the particular project design.

(7) Mitigation Measures: Inclusion or summary of (with attachment of full) Environmental and Social Management Plan (ESMP) (see indicative outline of ESMP below.) The ESMP identifies mitigation measures required to address identified social and environmental risks and impacts, as well as measures related to monitoring, capacity development, stakeholder engagement, and implementation action plan.

(8) Conclusions and Recommendations: Succinctly describes conclusion drawn from the assessment and provides recommendations.

(9) Appendices: (i) List of the individuals or organisations that prepared or contributed to the social and environmental assessment; (ii) References – setting out the written materials both published and unpublished, that have been used; (iii) Record of meetings, consultations and surveys with stakeholders, including those with affected people and local NGOs. The record specifies the means of such stakeholder engagement that were used to obtain the views of affected groups and local NGOs, summarizes key concerns and how

[18] For example, the Environmental, Health, and Safety Guidelines (EHSGs), which are technical reference documents with general and industry-specific statements of Good International Industry Practice. The EHSGs contain information on industry- specific risks and impacts and the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable cost. Available at www.ifc.org/ehsguidelines.

these concerns addressed in project design and mitigation measures; (iv) Tables presenting the relevant data referred to or summarized in the main text; (v) Attachment of any other mitigation plans; (vi) List of associated reports or plans.

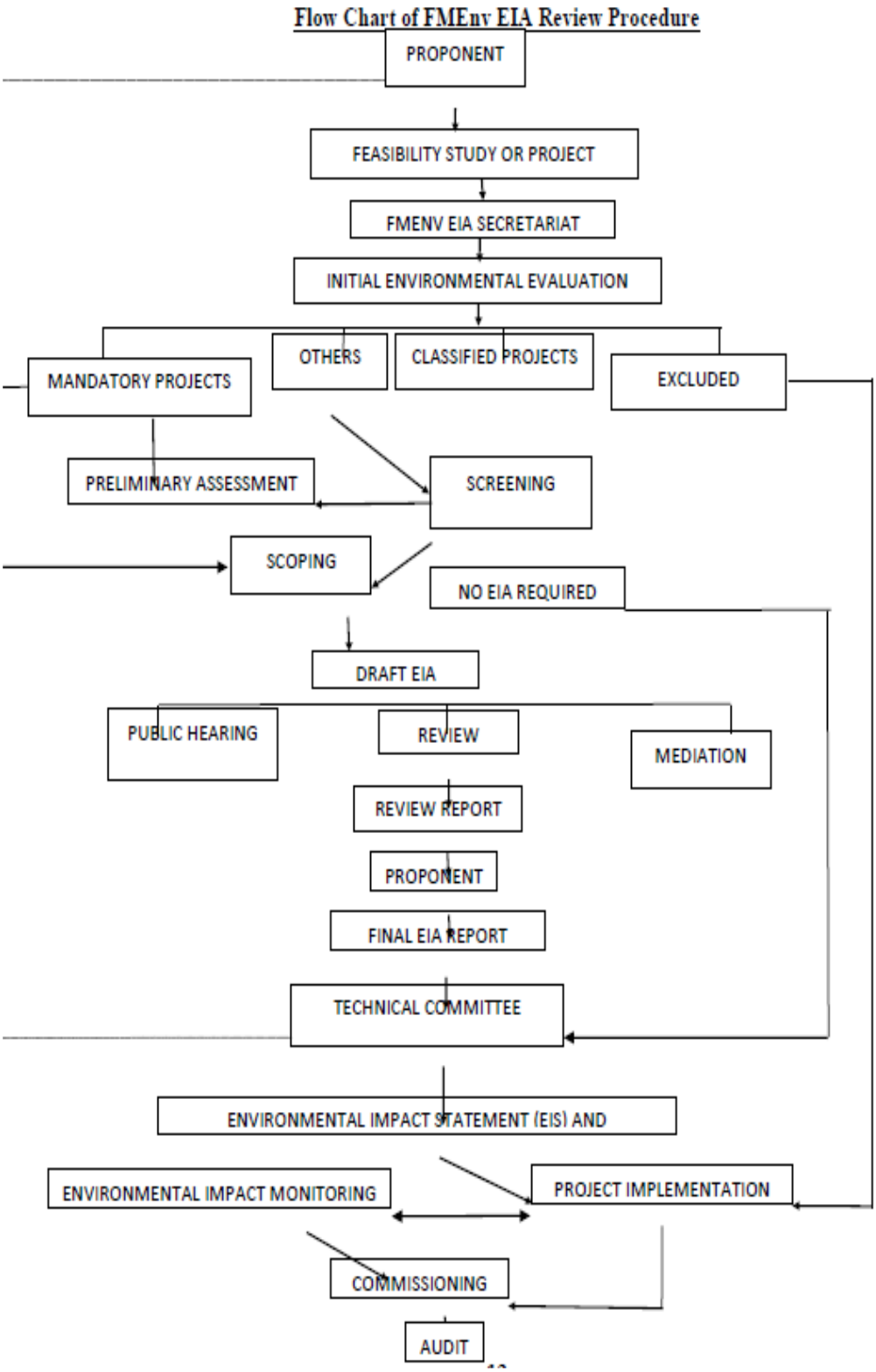
Required Content for ESIAs in Nigeria (FMEnv, 2017, pp. 15-16)

1. Table of contents
    a. Chapters and their titles
    b. List of maps, illustrations and figures
    c. List of Tables
    d. List of acronyms
    e. E.I.A. preparers
2. Executive summary
3. Acknowledgement
4. Introduction – Background information, Administrative and legal framework, Terms of Reference
5. Project Justification
    - need for the project
    - value of the project
    - envisaged sustainability
6. Project and/or Process Description
    - type (e.g. food processing)
    - input and output of raw materials and products
    - location
    - technological layout
    - production process
    - project operation and maintenance
    - project schedule
7. Description of the Environment including data acquisition
    - study approach
    - baseline data acquisition methods
    - geographical location
    - field data
    - climatic conditions
    - air quality assessments
    - noise level assessment
    - vegetation cover characteristics
    - potential land use and landscape patterns
    - ecologically sensitive areas
    - terrestrial fauna and wildlife
    - soil studies
    - aquatic studies, including hydro-biology and fisheries
    - groundwater resources
    - socio-economic resources
    - infrastructural services
8. Associated and Potential Environmental Impacts
    - impact prediction methodology

- significant positive impacts
- significant negative impacts
- site preparation and construction impacts
- transportation impacts
- raw material impacts
- process impacts
- project specific incremental environmental changes (if any)
- project specific cumulative effects
- project specific long/short term effects
- project specific direct/indirect effects
- project specific adverse/beneficial effects
- project specific risk and hazard assessments

9. Mitigation Measure/Alternatives
    - best available control technology/best practicable technology
    - liability compensation/resettlement
    - site alternative, location/routes
    - no project option
    - insert a table listing impacts with corresponding mitigation measures
    - compliance with health & safety hazards requirements
10. Environmental Management Plan
    - scope of monitoring
    - parameters to be monitored
    - methodology
    - monitoring schedule
11. Remediation plans after decommissioning/closure
12. Conclusions and Recommendations
13. Bibliography
14. Appendices

Overview of Environmental Review Procedure in Nigeria (FMEnv, 2017, p. 12)



ANNEX III

TORs for Contractor's Site-Specific ESMP and Site-Specific HSMP

REQUIREMENTS ON SITE-SPECIFIC ESMP[1]

1. Introduction

2. Brief description of relevant environmental and social characteristics of project site.

3. Project Description
   - Focus on impact-generating activities (e.g., demand of water and materials, earth movement, etc.).
   - Environmental liabilities: identify and include a photographic registry of pre-existing environmental liabilities (e.g., gully erosion areas, abandoned borrow pits, unauthorized dumping sites, etc.) and, hence, not attributable to the implementation of the project.

4. Potential Impacts during Mobilization, Construction and Demobilization
   - Apply simple rating of significance.
   - Quantify/qualify impacts (e.g., surface and type of vegetation to be removed, amount and type of wastes to be generated, noise levels, etc.).
   - Describe impacts by chainage (linear infrastructure projects or linear components of infrastructure projects)[2] and/or identify places where specific impacts will manifest (non-linear infrastructure projects).

5. Mitigation Plan
   - Specify the detailed measures to mitigate the identified impacts (also by chainage and/or location).
   - Include designs for measures requiring structural solutions (e.g., gabions, etc.).
   - Include the schedule of implementation of mitigation measures in relation to the general construction schedule.
   - Health and Safety Management Plan (detailed, see below).
   - Waste Management Plan (detailed).
   - Traffic Management Plan (detailed).
   - Training Program (detailed).
   - HIV/AIDS Awareness and Prevention Program.
   - Community Relations Program.
   - If applicable, location and technical specifications for installation and operation of campsites, including workshops, garages, laboratories, offices, sanitary installations, etc.
   - If applicable, location and technical specifications for operation of quarries and borrow pits, and procedures for negotiation with and compensation of land owners where they are located.

1 The source for the TORs included in this annex is Cabral, 2013, Annex X.

2 Examples of linear infrastructure projects are optical fiber cable networks for telecommunications, roads, oil and gas pipelines, and electrical transmission and distribution lines. Examples of linear components of infrastructure projects are the mains and pipes of water and sewage projects, and the access roads for hydroelectric projects.

- If applicable, location and technical specifications for installation and operation of concrete batching, stone crushing, cement mixing and asphalt plants.
- If applicable, location and technical specifications for installation and operation of temporary and permanent dump sites.

6. Inspection Plan
   - Inspection function: specify frequency, locations and instruments (e.g., checklists, site reports, photo registry, etc.) to conduct site inspections.
   - Permitting: required environmental permits and schedule to obtain them.

7. Monitoring Plan
   - Specify, for each variable: frequency of measurement, locations, methods/equipment, units/measures, quality standards, and reporting requirements and periodicity, including establishment of trends.

8. Organization and Management
   - Specify organizational structure, personnel, resource and equipment requirements, reporting requirements and periodicity, and inter-institutional communication and coordination mechanisms.

9. Annexes
   - If the Contractor wishes to incorporate information beyond the indicated above, such as the policy, institutional and regulatory framework for environmental management in Nigeria, biophysical and socioeconomic characteristics of the area of influence of the Project, World Bank safeguards policies, etc., that information should be included as an annex and not in the body of the site-specific ESMP. Preferably, such information should not be attached.
   - Annexes should be used, if necessary, to include detailed information on the specific topics of the ESMP (e.g., inspection forms or checklists, design of structural mitigation measures, photographic registry of environmental liabilities, etc.).

REQUIREMENTS ON SITE-SPECIFIC HSMP

1. Introduction (including objectives of the HSMP).

2. Hazard Prevention and Control
   - Risk assessment (including description of risk assessment method used).
   - Prevention, protection and control measures (based on risk assessment performed):
     - ✓ Personal protective equipment and clothing: safety goggles, ear plugs, work boots, dust masks, protective clothing etc.
     - ✓ Health and safety, and sanitary facilities, equipment, materials and personnel: first-aid kits and stations, health personnel, safe drinking water, sanitary facilities, accommodations, washing facilities, domestic waste disposal, etc.
     - ✓ On-site safety measures and procedures to protect workers against accidents and health risks in the performance of construction-related activities:
       - ➢ Site security: access, safety of visitors, separation of work and rest areas, signage, etc.
       - ➢ Over-exertion, and ergonomic injuries and illnesses (repetitive motion, manual handling, etc.).
       - ➢ Slips and falls (due to poor housekeeping, such as excessive waste debris, loose construction materials, liquid spills, and uncontrolled use of electrical cords and ropes on the ground).
       - ➢ Work in heights (risk of falls from elevation associated with working with ladders, scaffolding, and partially built or demolished structures).
       - ➢ Struck by objects.
       - ➢ Confined spaces, excavations and trenches.
       - ➢ Electric shock and arc flash/arc blast.
       - ➢ Handling of raw materials (earthwork, gravel, crushed rock, sand, etc.), handling of other materials causing dust development (such as cement), handling of hydrated lime and other activators and additives, handling of asphalt.
       - ➢ Handling of flammable materials.
       - ➢ Hazardous materials management.
       - ➢ Maintenance of vehicles and machinery.
       - ➢ Emergency prevention, preparedness and response.

3. Health and Safety Training Program
   - Provide specifics of training and instruction: topics, frequency, modalities, target audiences, instructors, training materials, etc.
   - Potential topics:
     - ✓ Occupational safety risks and prevention.
     - ✓ Health risks and prevention.
     - ✓ Use of personal protective equipment.
     - ✓ Safe work procedures: general and specific.

4. Organization and Management

- Organizational structure, personnel, equipment, communication and reporting requirements, accident and incident reports, and procedures and tools to verify and ensure compliance with occupational health and safety requirements.

5. Annexes
   - Annexes should be used, if necessary, to include detailed information on the specific topics of the HSMP, such as (illustrative list):
     - ✓ Accident Report forms.
     - ✓ Dangerous Occurrence forms (near misses).
     - ✓ Safety Audit Forms.
     - ✓ Safety Check List.
     - ✓ Safety Rules.
     - ✓ List of hospitals, emergency evacuation strategy and other arrangements to treat seriously injured staff.
     - ✓ List of personnel trained in first aid and their places of deployment.
     - ✓ List of first aid kits and locations where these will be held.

ANNEX IV

Environmental and Social Compliance Report for Construction of Storage Facilities

ENVIRONMENTAL AND SOCIAL COMPLIANCE REPORT FOR CONSTRUCTION OF STORAGE FACILITIES

Site:_____ Location:_____

Date of Site Visit:_____

Participants in Site Visit:_____

Name and job title of persons contacted:_____

Name and contact information of community members contacted (if applicable):_____
_____
_____

NOTE: A "YES" answer to any of the questions in the table below indicates a non-compliance or impact.

QUESTIONS	ANSWER			BRIEF DESCRIPTION OF IMPACT/NONCOMPLIANCE (INCLUDE LOCATION OF IMPACT)	RECOMMENDED ACTIONS	FOLLOW-UP ON IMPLEMENTATION OF ACTIONS (IF APPLICABLE)
	YES	NO	NA			
ORGANIZATION, REPORTING, TRAINING AND PERMITTING REQUIREMENTS						
Is the Contractor non-compliant with, as applicable, any of the requirements for socio-environmental management established in the works contract and the Site-Specific ESMP (e.g., staffing, management structure, equipment and other material resources (e.g., office space, vehicles, computers, field monitoring equipment, etc.), field inspection instruments and procedures, etc.)? (please specify)						

QUESTIONS	ANSWER			BRIEF DESCRIPTION OF IMPACT/NONCOMPLIANCE (INCLUDE LOCATION OF IMPACT)	RECOMMENDED ACTIONS	FOLLOW-UP ON IMPLEMENTATION OF ACTIONS (IF APPLICABLE)
	YES	NO	NA			
Is the Contractor non-compliant with socio-environmental reporting requirements? (please specify)						
Is the Contractor non-compliant with environmental effects monitoring requirements (please specify)						
Is the Contractor non-compliant with workers environmental, health and safety training and awareness requirements (please specify)						
Is the Contractor non-compliant with the required environmental permitting for the project (e.g., water abstraction, vegetation clearance, etc.) (please specify)						
Is the Contractor non-compliant with Nigerian labor laws and international labor standards, in particular in reference to right to receive just compensation and benefits for work, prohibition of forced and child labor, and prevention of sexual harassment and discrimination in the work place on the basis of gender, religion, social origin, etc.? (please specify)						
Is the Contractor failing to employ women or reducing the number of female employees in disproportionate numbers when compared to dismissed men? (please specify)						
ENVIRONMENTAL AND SOCIAL IMPACTS						
Is there standing water on the site? If yes, is there reason to believe the water has been standing longer than 4 days? (Standing water breeds insect disease vectors, particularly mosquitoes. It takes 4 days for the malaria-bearing anopheles						

QUESTIONS	ANSWER			BRIEF DESCRIPTION OF IMPACT/NONCOMPLIANCE (INCLUDE LOCATION OF IMPACT)	RECOMMENDED ACTIONS	FOLLOW-UP ON IMPLEMENTATION OF ACTIONS (IF APPLICABLE)
	YES	NO	NA			
mosquito to hatch and mature to its flying adult form)						
Is there erosion from the cleared site or from material stockpiles? Gullying on surrounding lands clearly caused by runoff from the site? (In addition to permanently degrading the site itself, erosion/ runoff from the site can degrade nearby surface waters and damage adjoining lands)						
Are fill, sand, and/or gravel being extracted from waterways or ecologically sensitive areas? (Extracting materials from streambeds and wetlands degrades water quality, ruins critical habitat, alters drainage and flow, and can create standing water)						
Is demolition debris or construction waste disposed in the open? (These wastes can pose physical hazards, such as broken glass and rusty torn roofing sheets, and toxic hazards, such as leaded paint, and can create breeding habitat for disease vectors)						
Are there fuel, oil, paint or chemical spills to ground or streams? (Such spills can contaminate soils, surface waters and groundwater)						
Is the site very dusty or noisy? (Dust and noise can have negative impacts on the health of workers and residents located close to construction site)						
Are operation and maintenance of construction plants inadequate and, hence, there is presence of excessive noise, vibrations, fumes and particle emissions?						

QUESTIONS	ANSWER			BRIEF DESCRIPTION OF IMPACT/NONCOMPLIANCE (INCLUDE LOCATION OF IMPACT)	RECOMMENDED ACTIONS	FOLLOW-UP ON IMPLEMENTATION OF ACTIONS (IF APPLICABLE)
	YES	NO	NA			
Are sprinklers lacking or damaged in crushing conveyors to spray mist/water on belts during crushing operations to help control dust?						
Are there excessive periods of interruption of access to public transport, or residential, commercial, health or institutional areas and services due to inadequate implementation of traffic control and safety measures during construction?						
Are there damages to public utilities and service lines, mains or pipes, and extended periods of interruption of services?						
Are quarries and borrow pits being operated in an unsafe or environmentally unsustainable manner?						
Is vegetation being cleared in areas beyond those indicated in contract drawings?						
Are there conflicts with local populations due to resource use, in particular water?						
Is there inadequate storage and utilization of top soils?						
Are there unresolved resettlement and compensation issues?						
Are there any manifestations of unintended or unanticipated impacts? (please specify type of impact and location)						
HEALTH AND SAFETY IMPACTS						
Is a well-marked site boundary absent and is an actively controlled access not provided?						
Are good housekeeping practices not in place, and is the site not maintained in a generally orderly condition?						
Are safety signs missing—at minimum, to mark site boundary, hardhat areas, explosion and toxic hazards?						

QUESTIONS	ANSWER			BRIEF DESCRIPTION OF IMPACT/NONCOMPLIANCE (INCLUDE LOCATION OF IMPACT)	RECOMMENDED ACTIONS	FOLLOW-UP ON IMPLEMENTATION OF ACTIONS (IF APPLICABLE)
	YES	NO	NA			
Is smoking allowed or not restricted to a designated smoking area well away from flammable materials?						
Is First Aid kit missing on site, and there is no one on site familiar with its use and trained in basic first aid?						
Drinking water and sanitary facilities are not provided (or are not very close at hand), including hand-wash station?						
Is personal protective equipment (PPE) inadequate or does it appear little-used (PPE must be adequate and used consistently to fulfill its intended function: helping protect workers against injuries and disease)						
Is scaffolding inadequate (i.e., not able to carry at least 4 times its maximum intended load without settling or displacement)?						
Is scaffolding inadequate (i.e., not on solid footing—boxes, loose bricks and stones, etc.)?						
Is scaffolding inadequate (i.e., does not have guardrails, midrails and toeboards)?						
Is scaffolding inadequate (i.e., not at least 3 metres from any electric power line)?						
Are scaffolding inspections insufficient (i.e., not inspected each day by a competent manager)?						
Is fall protection inadequate (i.e., there are no guardrails or at least ropes near the edge of floors and roofs where a drop is greater than 2 metres. Where not possible, workers in these areas do not wear a body harness and rope?						

QUESTIONS	ANSWER			BRIEF DESCRIPTION OF IMPACT/NONCOMPLIANCE (INCLUDE LOCATION OF IMPACT)	RECOMMENDED ACTIONS	FOLLOW-UP ON IMPLEMENTATION OF ACTIONS (IF APPLICABLE)
	YES	NO	NA			
Are trenches inadequate (i.e., spoils are not maintained at least 1 metre back from edge of trench)?						
Are trenches inadequate (i.e., trench walls are not shored or sloped back for any trench 1.75 metres or deeper)?						
Are trenches inadequate (i.e., for any trench 1.75 metres or deeper, there is not a means of exit (ladder, stair, ramp) at least every 10 metres?						
Is leaded paint or asbestos in any form used in new construction?						
Are painted surfaces being scraped or sanded? (Paint containing lead is very common in some countries. Scraping or sanding releases lead dust, a toxic health hazard to workers)						
Are asbestos roofing sheets, linoleum, fiberboard ceiling or wall panels or pipe insulation being removed/disturbed? (Asbestos should be assumed to be present in all these products. When disturbed, carcinogenic asbestos fibers may be released)						
For rehabilitation or demolition, the contractor failed to check prior to commencing work whether lead-based paint, asbestos (including roofing sheets) and other toxics are present?						

Source: Cabral, 2013, Annex XVI.

MAJOR NON-COMPLIANCES AND IMPACTS, AND RECOMMENDED ACTIONS FOR FOLLOW-UP

Based on the Environmental and Social Compliance Report, list in the table below the major non-compliances and impacts detected, as well as the main actions recommended to address them. This table will serve to prioritize the follow-up of those actions in future oversight visits.

BRIEF DESCRIPTION OF IMPACT/NONCOMPLIANCE (INCLUDE LOCATION OF IMPACT)	RECOMMENDED ACTIONS	FOLLOW-UP ON IMPLEMENTATION OF ACTIONS (IF APPLICABLE)

Report prepared by:

Signature: _____ Date: _____

Name (print): _____ Job Title: _____

ATTACHMENTS

ANNEX V

Checklist for Inspection of Facilities

CHECKLIST FOR INSPECTION OF FACILITIES

Facility: _____ Address: _____

Date of Inspection: _____

Participants in Inspection: _____

Name and job title of persons contacted: _____

Name and contact information of community members contacted (if applicable):_____

OVERSIGHT OF ACTIVITIES RELATED TO MANAGEMENT OF PCBs			
Project Components	**Activities**	**Risks to Verify**	**Comments/ Recommendations**
Inventory in 22 States Not Previously Covered by Other Inventories	Sampling of transformer oil	Spill from transformers by sampling	
		Accidental electrical shock	
	Disposal of waste from sampling	Releases of PCB to the environment from PCB-containing waste from sampling disposed of inadequately	
	All physical activities involved in dismantling and packaging of transformers and capacitors	Occupational exposure of workers to PCBs. Accidents in which workers are injured by the transformers. Accidental electrical shock.	
	Draining and packaging of transformers	Spill of PCB to the ground	
	Storage of oil and transformers before transport	Leakages of PCB from containers. Accidental fire with formation of PCDD/PCDF.	
	Dismantling and packaging of capacitors	Leakages of PCB from damaged capacitors	
Environmentally Sound Disposal of Identified PCBs	All transport activities	Releases of PCBs from leaking containers	
	Road transport	Releases of PCB from crushed containers in case of traffic accidents and exposure of the general population in the area	
		Formation of PCDDs/PCDFs in case of fire in traffic accidents	

	Dismantling and cleaning of transformers and destruction of PCB oil	Occupational exposure of workers to PCB. Accidents in which workers are injured by transformers. Releases of PCB from the dismantling and cleaning of transformers and from waste. Formation of PCDDs/PCDFs in case of accidental fire in dismantling facility.	
		Releases of non-destructed PCBs in waste products from dichlorination processes	
	Replacement of contaminated transformers and installations of PCB-free transformers	Occupational exposure of workers involved in replacement transformers. Accidents in which workers are injured by the transformers.	
	Interim storage of PCB-contaminated equipment	Leakages from stored equipment and waste	
		Formation of PCCD/PCDF in case of fire in storage	
	Interim storage of PCB-containing oil	Release of PCB in case drums are overturned or break	
		Formation of PCCD/PCDF in case of fire	
	All physical activities involved in destruction of PCB-contaminated oil	If dechlorination: same issues as for draining, and decontamination	
INSPECTION OF PHYSICAL CHARACTERISTICS OF PCB COLLECTION AND TREATMENT FACILITIES			
Project Component	**Characteristics to Inspect**	**Issues to Verify**	**Comments/ Recommendations**
PCB collection and treatment centres	Structural conditions of storage facility	Does storage facility meet the following structural requirements? • The materials to be stored, such as electrical equipment, containers, etc., must be completely isolated from the physical environment (i.e., with no contact with soil, vegetation, water bodies, etc.). • It must have a spill containment system with a closed perimeter with the ability to contain spills with a volume greater than the liquid stored in equipment and containers. • A good ventilation system must be in place, sufficient to ensure adequate air circulation to prevent vapour accumulation of PCBs, taking into account that PCB vapours may be heavier than air. This system can be natural ventilation through openings in the top and bottom of the storage. If a mechanical ventilation system is in place, it should be controlled by a switch outside the storage area and be switched on a few minutes before entering it. • All materials used in the construction of the storage facility must be non-combustible. • The compound should be completely roofed and single-storied.	

		• The floor must be made of concrete to carry the weight of the load to be deposited as well as the movement of heavy equipment and vehicles such as forklifts or cranes. The floor must be smooth, anticorrosive and it is recommended to seal it with an epoxy paint resistant to PCB, fire, liquids with a pH from 1 to 13 and a temperature of up to 70°C. • There should be no drain valves, floor drains, expansion joints, sewer lines, or other openings that would permit liquids to flow from the curbed area. • Channels or dams, including a collection tank at one end of the storage area, must be in place. • There must be an emergency exit. • A locker room with toilets, shower, eye wash and a sink for emergencies should be close to the storage area. Lockers for personal protective equipment and disposable clothing intended for workers who perform work on site must also be in place. • It is advisable to install a lightning conductor and an electrical system with adequate safety features.	
	Areas for storage of hazardous wastes	Does storage area meet the following requirements? • The storage site must have all appropriate safety equipment, including equipment for fire protection and spill response. • Authorised personnel for entering and conducting work within the storage area must at all times wear personal protective equipment. They must also have at their immediate disposal means of communication such as a telephone, cellular or radio, to report any incident occurring in the area. • It must be prohibited to smoke, eat or drink within the storage area and to do work that involves a heat source. • All PCB-contaminated wastes must be stored in UN-certified drums or containers. The PCB-contaminated equipment and containers must be completely airtight, be in a well-ventilated place, protected from oxidizing or corrosive materials, stowed on pallets without being stacked, accessible, with easy access for inspection, preserving corridors for internal circulation of forklifts and easily visible identification. • The facility shall not be used for the storage of other waste. • Qualified trained staff should be assigned to be responsible for the storage area, including for the following activities: – daily inspections, which should be noted in a register; – recording equipment or containers that enter the collection centre with all information available; – recording of incidents such as spills, fires or other occurrences. • Security procedures should be placed in the facility in prominent locations.	

		• Next to the storage area, there should be an area for the storage of materials, tools and equipment required to transfer PCB from one equipment or container to another. • The lighting of the storage area must be connected through a device that is outside the storage area. • There should be automatic fire detection sensors. • The entrance should be labelled with a sign indicating the prohibition of unauthorised personnel and indicating also the type of hazardous material stored. • The storage should be closed with a safety lock and telephone numbers for emergency calls should be available outside the storage area. • An Emergency Preparedness and Response Plan should be in place. • The facility should have written instructions and procedures covering: – Reception, storage, draining and decontamination of PCB-containing transformers and oil, including safety procedures. – Clean up of packaging, vehicles, floors, curbing, wells, etc. – Inspection and supervision. – Response to emergencies and accidents. – All instructions and procedures shall be available to the staff and the authorities in English and, as applicable and depending on the region of the country where sites are located, instructions and procedures shall be provided to staff in Hausa, Yoruba or Igbo.	

Checklist completed by:

Signature: _____ Date: _____

Name (print): _____ Job Title: _____

ATTACHMENTS

ANNEX VI

Grievance Registration Form

ENVIRONMENTALLY SOUND MANAGEMENT AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PBCs) IN NIGERIA

Project Management Unit (PMU)
Grievance Redress Committee (GRC)

Grievance Registration Form

Grievance Number: _____

Subproject Name/Code: _____ Location: _____

General Information Name of Grievant…….Position…….…… Email ……. Cell phone ……...…….. Address…… Province……..…….
Type of Grievance Please describe the type of grievance and the problem briefly (include specific details)
Who or what is the source of the grievance?
Have you lodged the grievance previously on the same subject?

What you think should be done to resolve the complaint or grievance?
Fingerprint and signature of: Grievant…….……Date…….
Receiver: Name…….. Position……. Signature……Date……...……..

ANNEX VII

Grievance Logbook

ENVIRONMENTALLY SOUND MANAGEMENT AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PBCs) IN NIGERIA

Project Management Unit (PMU)
Grievance Redress Committee (GRC)

Grievance Logbook

S. No	Complainant's Name, address and Phone	State	Local Government Area	Village	Date	Complaints	Decision taken by Committee

ANNEX VIII

Grievance Decision Form

ENVIRONMENTALLY SOUND MANAGEMENT AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PBCs) IN NIGERIA

Project Management Unit (PMU)
Grievance Redress Committee (GRC)

Grievance Decision Form

Grievance Number: _____

Subproject Name/Code:_____ Location:_____

General Information
Name of Grievant.....Type of Grievance..... Date Grievance Lodged..... Date Grievance Decided.....
Committee Decision and Justification
Please describe the type of grievance, what the committee decided, and how. (include specific details) Discussion: _____ _____ _____ _____ Final Decision: _____ _____

Committee Members

1: Name.....Position.....Signature.....Date.....

2: Name.....Position.....Signature.....Date.....

3: Name.....Position.....Signature.....Date.....

4: Name.....Position.....Signature.....Date.....

5: Name.....Position.....Signature.....Date.....

Agreement of the Grievant to the above Decision

I ……. agree/disagree with the decision taken.

Name……..…….
Signature……..……Date……..…

ANNEX IX

Grievance Report Format

ENVIRONMENTALLY SOUND MANAGEMENT AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PBCs) IN NIGERIA

Project Management Unit (PMU)
Grievance Redress Committee (GRC)

Grievance Report for Month/Quarter (please specify month/quarter and year):

Complaints Received (No.)	Complaints Discussed	Complaints Resolved	Complaints Not Resolved/Rejected	Complaints Pending	Solution Accepted by Complainants	Complaints Referred to Court	Remarks