



SYRIAN MINISTRY OF ENERGY

PUBLIC ESTABLISHMENT FOR TRANSMISSION AND
DISTRIBUTION OF ELECTRICITY (PETDE)

SYRIA EMERGENCY ELECTRICITY PROJECT (SEEP)

Annex D - Hazardous Material and Waste Management Plan (HM/WMP)

Final

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LIST OF ACRONYMS & GLOSSARY

Acronym	Full Term	Brief Description
ACM	Asbestos-Containing Material	Building or insulation material containing asbestos fibers; treated as hazardous when encountered.
CESMP	Construction Environmental and Social Management Plan	Contractor's integrated E&S management plan for the construction phase, including waste and hazardous materials.
CLMP	Contaminated Land Management Plan	Plan for identifying, assessing and managing contaminated soil and legacy pollution at project sites.
DWMP	Decommissioning Waste Management Plan	Future plan to manage wastes and hazardous materials generated during asset decommissioning.
E&S	Environmental and Social	Combined term for environmental and social aspects, risks and impacts.
EHS	Environment, Health and Safety	Integrated management of environmental, health and safety issues.
EPC	Engineering, Procurement and Construction	Turnkey contractor responsible for design and construction of project works.
ESCP	Environmental and Social Commitment Plan	Time-bound commitments agreed between PETDE/GoS and the World Bank on E&S actions and reporting.
ESF	Environmental and Social Framework	World Bank framework comprising ESS1–ESS10 for managing E&S risks.
ESIA	Environmental and Social Impact Assessment	Assessment of project E&S risks and impacts and definition of mitigation measures.
ESMIP	Environmental and Social Management Implementation Plan	ESIA chapter describing how ESMP measures, monitoring, and KPIs are implemented and verified.
ESMP	Environmental and Social Management Plan	Plan specifying mitigation, monitoring and institutional measures to address E&S risks.
ESS	Environmental and Social Standard	Individual standards under the ESF (ESS1–ESS10).
GHG	Greenhouse Gas	Gas that contributes to climate change, such as SF ₆ and CO ₂ .
GIIP	Good International Industry Practice	Widely accepted international practice for managing E&S risks in the sector.
HM/WMP	Hazardous Materials and Waste Management Plan	This Annex; sets requirements for managing hazardous materials and all waste streams.
HSE	Health, Safety and Environment	Common term for integrated health, safety and environmental management.

IT	Information Technology	Systems and assets related to electronic data and equipment (relevant for data-bearing e-waste).
LMP	Labor Management Procedures	ESS2 instrument defining labor terms, OHS obligations and worker GM (to be prepared for SEEP).
MSDS / SDS	(Material) Safety Data Sheet	Manufacturer-provided safety information for chemicals and hazardous materials.
OESMP	Operational Environmental and Social Management Plan	ESMP applied to the operation and maintenance phase.
OE	Owner's Engineer	Supervision consultant supporting PETDE/PMT in technical and E&S oversight.
OHTL	Overhead Transmission Line	High-voltage line on towers forming part of the transmission network.
O&M	Operation and Maintenance	Routine operation, inspection and maintenance of substations and OHTLs.
PCB	Polychlorinated Biphenyl	Persistent, toxic chemicals historically used in electrical equipment; treated as hazardous waste.
PETDE	Public Establishment for Transmission and Distribution of Electricity	SEEP implementing agency responsible for transmission and distribution assets.
PMT	Project Management Team	PETDE team responsible for day-to-day SEEP implementation and oversight.
RP	Resettlement Plan	Site-specific plan under ESS5 to address physical or economic displacement.
LRP	Livelihood Restoration Plan	ESS5 plan to restore or improve livelihoods where income sources are affected.
SF₆	Sulfur Hexafluoride	High-voltage insulating gas; potent greenhouse gas requiring tight leak control and recovery.
SWM	Solid Waste Management	Systems and practices for handling municipal and other solid wastes.
WB	World Bank	Financing institution applying the ESF and ESS1–ESS10 to SEEP.
WBG	World Bank Group	Group of institutions including the World Bank; issues the EHS Guidelines.
WMP	Waste Management Plan	Plan for segregation, storage, transport and disposal of project waste, often embedded in CESMP/OESMP.

1. PURPOSE AND SCOPE

This Hazardous Materials and Waste Management Plan (HM/WMP) defines the procedures, roles, controls, monitoring requirements, and documentation systems needed to ensure safe and compliant management of hazardous materials and waste streams generated under the Syria Electricity Emergency Project (SEEP).

This Plan applies to both the construction phase (primarily implemented by Engineering, Procurement and Construction (EPC) Contractors and their subcontractors) and the operation and maintenance phase (implemented by Public Establishment for Transmission and Distribution of Electricity (PETDE) Operation and Maintenance (O&M) departments), with a stronger emphasis on construction where waste generation and hazardous material handling are more intensive. A Decommissioning Waste Management Plan (DWMP) will need to be prepared before any future decommissioning phase.

The Plan operationalizes all commitments made in:

- SEEP Environmental and Social Impact Assessment (ESIA) (especially Chapter 17 – Solid and Hazardous Waste and Chapter 26 – Environmental and Social Management Implementation Plan (ESMIP))
- Environmental and Social Management Plans (ESMPs) for Overhead Transmission Lines (OHTLs) and Substations
- SEEP Environmental and Social Commitment Plan (ESCP)
- SEEP OHS Plan
- World Bank ESF (ESS1, ESS2, ESS3, ESS4, ESS10)
- World Bank Group (WBG) General and T&D Environment, Health and Safety (EHS) Guidelines
- Applicable Syrian regulations
- GIIP for hazardous materials and waste in electric power transmission/distribution systems, especially in FCV environments

This Plan applies to:

- PETDE/ Project Management Team (PMT)
- EPC Contractors
- All subcontractors
- PETDE O&M teams (post-rehabilitation)
- Owner's Engineer (OE) / Supervision Consultant

It covers:

1. Hazardous materials (procurement ⇒ storage ⇒ handling ⇒ use ⇒ decommissioning)
2. Hazardous and non-hazardous wastes (segregation ⇒ storage ⇒ transport ⇒ treatment/disposal)
3. Spill prevention and response
4. Contaminated soil and legacy contamination

5. Monitoring, KPIs, record-keeping and reporting

2. OBJECTIVES

- Prevent environmental contamination, occupational health risks and community exposure.
- Ensure full compliance with the SEEP ESIA/ESMP, ESCP and ESF requirements.
- Manage hazardous materials safely throughout their life cycle.
- Ensure proper segregation, storage, transport, treatment, and disposal of all waste streams.
- Identify and manage legacy contamination (oil, asbestos, Polychlorinated Biphenyl (PCBs), contaminated soil).
- Provide PETDE and contractors with clear operational procedures.
- Enable consistent monitoring and performance verification per ESMIP.

3. APPLICABLE LEGAL AND STANDARDS FRAMEWORK

3.1 SYRIAN LEGISLATION (AS APPLICABLE)

- National laws governing waste management, environmental protection, and worker safety
- Requirements for storage of hazardous materials (fuel, oils, chemicals)
- Transport rules for dangerous goods
- Fire safety and civil defense requirements
- Any local authority instructions for waste handling, transfer or storage

According to the ESIA, Syria currently lacks operational (licensed) hazardous waste disposal facilities. This Plan therefore emphasizes containment, safe storage, and controlled transfer to recognized intermediaries or temporary accumulation centers with the approval of the competent authorities until lawful disposal routes are available.

3.2 WORLD BANK ESF

- ESS1 – Assessment and Management of Environmental and Social (E&S) Risks
- ESS2 – Labor and Working Conditions
- ESS3 – Resource Efficiency and Pollution Prevention & Management
- ESS4 – Community Health and Safety
- ESS10 – Stakeholder Engagement

3.3 WBG EHS GUIDELINES

- General EHS Guidelines:
 - Hazardous Materials Management
 - Waste Management
 - Emergency Preparedness and Response

- Air Emissions and Ambient Air Quality
- Occupational Health and Safety
- T&D EHS Guidelines:
 - PCBs, Sulfur Hexafluoride (SF₆), transformer oils
 - Substation hazardous materials
 - OHTL construction waste streams

3.4 OTHER STANDARDS

- ILO conventions on workplace chemicals and safety
- GIIP on transformer oil management, SF₆ handling, and spill prevention
- OEM manuals for electrical and mechanical equipment

4. ROLES AND RESPONSIBILITIES

Effective implementation of this Hazardous Materials and Waste Management Plan requires clear definition of responsibilities across PETDE, the Project Management Team (PMT), the Owner's Engineer (OE), EPC Contractors, subcontractors, and PETDE O&M departments. Table 4-1 outlines that during construction, EPC Contractors handle hazardous materials, waste, and spill prevention, while in operation and maintenance, PETDE O&M departments take over long-term management of hazardous materials and waste for rehabilitated assets. These roles reflect the commitments specified in the ESIA, ESMPs, ESIMP (Chapter 26), and ESCP, and ensure that responsibilities for oversight, implementation, monitoring, and reporting are fully aligned with World Bank ESF requirements.

Table 4-1. Roles and Responsibilities for HM/WMP Implementation

Entity	Key Responsibilities
PETDE Senior Management / PMT	<ul style="list-style-type: none"> - Ensure SEEP compliance with ESS3 and ESIA/ESMP requirements - Include HM/WMP requirements in contracts - Approve EPC HM/WMPs - Ensure safe site handover - Verify PETDE O&M readiness - Ensure reporting to World Bank (WB) per ESCP
PETDE E&S Unit (PMT)	<ul style="list-style-type: none"> - Oversight of Contractor implementation - Monitoring and auditing per ESMP - Verification of hazardous material inventories - Review waste records - Maintain consolidated SEEP waste database
PETDE O&M Directorates	<ul style="list-style-type: none"> - Apply this HM/WMP to operation of rehabilitated substations and OHTLs - Manage SF₆, transformer oils, batteries and fuel - Maintain hazardous material storage areas - Ensure O&M spill response preparedness
Owner's Engineer (OE)	<ul style="list-style-type: none"> - Review and recommend approval of Contractor HM/WMPs

	<ul style="list-style-type: none"> - Perform site audits and inspections - Verify waste segregation, storage, transport - Sign off on major waste transfers - Notify PETDE of noncompliance
EPC Contractor Project Manager	<ul style="list-style-type: none"> - Overall accountability for hazardous materials and waste compliance - Resource HM/WMP implementation - Approve inventories - Ensure subcontractor compliance
EPC Contractor HSE/Environmental Manager	<ul style="list-style-type: none"> - Develop and implement Contractor HM/WMP - Establish waste segregation and storage areas - Maintain hazardous materials inventory and SDS - Oversee spill prevention - Maintain waste manifests
Subcontractors	<ul style="list-style-type: none"> - Comply with EPC Contractor procedures - Segregate waste at source - Maintain housekeeping.
Workers	<ul style="list-style-type: none"> - Follow HM/WMP requirements - Use PPE - Report spills or unsafe storage immediately

5. HAZARDOUS MATERIALS MANAGEMENT

Hazardous materials expected under SEEP include (per ESIA Ch.17 and ESMPs):

- Transformer oils
- Lubricants
- Fuels (diesel, gasoline)
- SF₆ gas
- Batteries (lead-acid and lithium-ion)
- Paints, solvents, adhesives, resins
- Cleaning agents and degreasers
- Compressed gases (oxygen, acetylene)
- Small quantities of laboratory chemicals or reagents
- Asbestos-containing materials *if encountered*
- Materials in deteriorated or legacy equipment (corrosion, insulation, residual oils)

5.1 PROCUREMENT AND SUBSTITUTION

- Use non-hazardous alternatives where feasible (ESS3 Resource Efficiency).
- Avoid procurement of materials containing PCBs.
- Verify SF₆ purity certificates; procure only from certified suppliers.
- Ensure suppliers provide SDS/MSDS in Arabic and English.

- Maintain material compatibility with storage requirements.

5.2 HAZARDOUS MATERIALS INVENTORY

Contractors and PETDE O&M must maintain:

- A Hazardous Materials Register listing:
 - Type and quantity
 - Location
 - Hazard class
 - SDS availability
 - Expiry dates
- Monthly updates submitted to PETDE/PMT.
- Annual consolidated register by PETDE.

5.3 LABELING AND SDS

- All containers must be labeled in Arabic and English.
- SDS must be available at storage areas and accessible to workers.
- SDS must inform PPE selection, storage compatibility, and spill response.

5.4 STORAGE REQUIREMENTS

- General Requirements
 - Ventilated, dry, locked storage rooms.
 - Secondary containment for all liquids (110% of largest container).
 - Segregation by hazard class (flammables, corrosives, oils, SF₆).
 - No storage near drains, watercourses, or public areas.
 - Fire extinguishers appropriate to material type.
- Transformer Oils & Lubricants
 - Store in double-walled tanks or bunded drums.
 - Spill kits and absorbents required.
 - Avoid storage adjacent to energized equipment.
 - For decommissioned oil: clearly mark as "used oil—hazardous".
- Fuels
 - Store in approved tanks with bunds.
 - No refueling within substations unless on spill-proof pads.
 - Grounding for static electricity.
- SF₆ Gas (Per ESIA and T&D EHS Guidelines):
 - Store cylinders upright and secured.
 - Use trained and certified handling personnel.
 - Leak detection to be performed before and after work.

- Mandatory use of recovery units to avoid venting.
- Maintain SF₆ consumption and loss logs.
- Batteries (including alkaline batteries)
 - Store lead-acid batteries upright on acid-resistant trays.
 - Keep spent batteries in separate, ventilated storage.
 - Prevent freezing or extreme heat exposure.
 - Never store lithium-ion batteries near flammable materials.
- Paints, Solvents, Adhesives
 - Store in flammable material cabinets.
 - No smoking or ignition sources.
- Compressed Gas Cylinders
 - Secure vertically.
 - Use caps when not connected.
 - Oxygen and fuel gases stored separately.

6. WASTE CLASSIFICATION AND EXPECTED WASTE STREAMS

Per ESIA Ch. 17, typical SEEP waste streams include:

6.1 NON-HAZARDOUS SOLID WASTE

- General domestic waste from workers (packaging, food waste, paper).
- Scrap metal (steel, copper) – recyclable.
- Construction debris (small quantities).
- Concrete/aggregate debris from minor works.

6.2 HAZARDOUS WASTE

- Used transformer oil
- Used lubricants
- SF₆ recovered gas (treated as hazardous for handling purposes)
- Oil-contaminated rags and absorbents
- Oil filters
- Paint waste, solvent waste
- Used batteries
- E-waste (control, protection and telecommunication equipment)
- Oily sludge
- Contaminated soil (where spills or legacy contamination exist)
- Asbestos-containing materials (if encountered)
- Old insulation materials

- Old capacitors or components with PCB suspicion (treated as hazardous unless proven otherwise)

7. WASTE MANAGEMENT PROCEDURES

7.1 WASTE MINIMIZATION

- Order quantities to avoid excess.
- Reuse metal scrap where feasible.
- Reduce packaging.

7.2 SEGREGATION AT SOURCE

- Color-coded or labeled bins:
- General waste
- Recyclables
- Oil-contaminated waste
- Hazardous waste
- Batteries
- E-waste

7.3 TEMPORARY STORAGE AREAS

- Must include:
- Impermeable floor
- Weather protection
- Bunding for liquid wastes
- Locked containers for hazardous waste
- Spill kits and fire extinguishers
- Signage in Arabic and English

7.4 TRANSPORTATION

- Follow Syrian transport requirements and GIMP for dangerous goods.
- Vehicles must carry spill kits.
- Transport manifests required for every transfer.
- OE and PETDE to authorize major shipments.

7.5 TREATMENT AND DISPOSAL

Given Syria's limited hazardous waste infrastructure (ESIA Ch. 17):

- Hazardous waste shall be securely stored and periodically transferred to the nearest available authorized facility (municipal, industrial zone, or storage terminal designated by authorities).

- Export of hazardous waste may be required for certain materials (e.g., transformers requiring PCB disposal, SF₆ recovery units). This requires government authorization.

7.6 WASTE MANIFESTS AND DOCUMENTATION

Minimum documentation:

- Waste manifest forms
- Hazardous waste register
- Chain of custody
- Disposal certificates (when applicable)

8. CONTAMINATED SOIL AND LEGACY CONTAMINATION

Per ESIA Chapter 17 and Contaminated Land Management Plan (CLMP) requirements:

- Conduct pre-construction visual inspection and sampling where contamination is suspected.
- If contaminated soil is identified:
 - Isolate area
 - Stop work
 - Notify PETDE/PMT and OE
 - Implement contamination delineation
 - Remove contaminated soil to designated storage
 - Maintain records of quantity, location, and fate

Asbestos (If Encountered)

Because asbestos was not visually identified but cannot be ruled out:

- Treat unknown suspicious insulation/cladding as *potential asbestos* until proven otherwise.
- Apply stop-work and isolation.
- Prohibit cutting, breaking, or disturbing material.
- Use NIOSH-approved PPE if limited handling is necessary.
- Engage licensed asbestos specialists if confirmation or removal is required.
- Integrate asbestos checks into CLMP site-specific contamination screening.

9. SPILL PREVENTION AND RESPONSE

Directly linked with ERP and OHS Plan.

9.1 PREVENTION

- Secondary containment for all oils and chemicals
- Drip trays under equipment and refueling points
- Routine inspection for leaks
- Emergency shutoff valves for tanks
- Regular SF₆ leak testing

9.2 SPILL RESPONSE PROCEDURE

1. Stop work and raise alarm
2. Contain spill using absorbents
3. Prevent discharge to drains/natural watercourses
4. Use PPE (gloves, goggles, respirator as needed)
5. Report to HSE Manager immediately
6. Record incident
7. Collect waste and store in hazardous waste area
8. Conduct root-cause investigation

10. MONITORING, KPIS AND REPORTING

Key performance indicators and monitoring requirements for solid and hazardous waste management are aligned with ESIA Chapter 17 and the ESMIP (Table 17-7). The minimum project-wide KPIs are summarized in Table 10-1 and Table 10-2 below; contractors and PETDE O&M may add more stringent indicators but may not dilute these targets.

Table 10-1. Construction Phase – HM/WMP KPIs, Monitoring and Reporting

Aspect / Topic	KPI	Target (Minimum)	Monitoring Frequency	Responsibility	Reporting / Outputs
Waste segregation & housekeeping	Work fronts equipped with segregated bins/skips	100% active work fronts	<ul style="list-style-type: none"> - Daily housekeeping checks - Weekly site walk-throughs 	<ul style="list-style-type: none"> - EPC Contractor (Site Manager / HSE) - oversight by PETDE PMT / OE 	<ul style="list-style-type: none"> - Recorded in daily/weekly inspection forms - summarized in monthly HM/WMP report from Contractor to PETDE/PMT - checked in quarterly ESMP audits by PETDE/PMT or OE
	Littering / open dumping at work fronts	0 instances (per month, per work front)	<ul style="list-style-type: none"> - Daily housekeeping checks - Weekly site walk-throughs - Monthly review of incident/inspection logs 	<ul style="list-style-type: none"> - EPC Contractor HSE - PETDE PMT / OE 	<ul style="list-style-type: none"> - Non-compliances recorded in site logs and incident register - corrective actions tracked in monthly HM/WMP report - recurring issues highlighted in quarterly ESMP summary
Hazardous waste storage & handling	Hazardous waste containers correctly labeled and closed	100% hazardous containers	<ul style="list-style-type: none"> - Weekly store inspection - After ≥10 mm/24 h rainfall 	EPC Contractor HSE	<ul style="list-style-type: none"> - Findings captured in weekly store inspection checklists - summary status and any non-conformities reported monthly to PETDE/PMT - trends reviewed in quarterly audits
	Bunded hazardous-waste store in place where hazardous waste is generated	100% relevant sites	<ul style="list-style-type: none"> - Weekly store inspection - After ≥10 mm/24 h rainfall 	<ul style="list-style-type: none"> - EPC Contractor HSE - PETDE PMT / OE (quarterly audit) 	<ul style="list-style-type: none"> - Presence/condition of bunded store recorded in inspection/audit reports - deficiencies included in corrective action plans and monthly / quarterly reporting
	Leaks/spills from hazardous waste storage	0 uncontrolled leaks	<ul style="list-style-type: none"> - Continuous observation - Weekly inspections - Event-based incident reporting 	<ul style="list-style-type: none"> - EPC Contractor - PETDE PMT / OE 	<ul style="list-style-type: none"> - All leaks/spills recorded as incidents - serious spills reported immediately as per ESCP - monthly incident statistics and root-cause follow-up included in HM/WMP report
Transport & disposal traceability	Waste shipments accompanied by complete manifests	100% shipments	<ul style="list-style-type: none"> - Per-shipment document check - Monthly summary review 	<ul style="list-style-type: none"> - EPC Contractor Logistics - PETDE PMT / OE (quarterly review) 	<ul style="list-style-type: none"> - Manifests attached to shipment files - monthly manifest register submitted with HM/WMP report - sampling of manifests documented in quarterly ESMP audits
	Disposal / recycling receipts on file	<ul style="list-style-type: none"> - 100% shipments - Receipts filed within ≤10 days of dispatch 	<ul style="list-style-type: none"> - Per-shipment document check - Monthly summary review 	<ul style="list-style-type: none"> - EPC Contractor - PETDE PMT / OE 	<ul style="list-style-type: none"> - Receipt dates logged in waste register - any overdue receipts flagged in monthly report - spot-checks and follow-up documented in quarterly audits
Concrete washout & residues	Lined washout in place before any concrete pour	100% concrete works	Daily checks during pours	<ul style="list-style-type: none"> - EPC Contractor Site Manager - OE spot checks 	<ul style="list-style-type: none"> - Concrete pour checklists and photos kept on file - compliance summarized in monthly HM/WMP report - non-compliances noted in OE site visit reports
	Uncontrolled discharge of concrete wash water or residues to ground/surface water	0 events	<ul style="list-style-type: none"> - ≥10 mm/24 h - Incident log review 	EPC Contractor HSE	<ul style="list-style-type: none"> - Any discharge events recorded as incidents with corrective actions - reported in monthly HM/WMP report and, if significant, flagged in quarterly ESMP reporting
SF ₆ recovery (if applicable)	SF ₆ interventions (recovery, transfer, re-filling) logged in SF ₆ register	100% interventions	<ul style="list-style-type: none"> - Each intervention - Quarterly summary 	<ul style="list-style-type: none"> - Certified SF₆ Technician - EPC Environmental Lead 	<ul style="list-style-type: none"> - SF₆ log maintained and attached to quarterly HM/WMP summary - anomalies or data gaps flagged in PETDE/PMT and OE reviews
	Uncontrolled SF ₆ releases during construction	0 uncontrolled releases	<ul style="list-style-type: none"> - Continuous during work - Incident reporting where anomalies occur 	<ul style="list-style-type: none"> - EPC HSE - PETDE PMT 	<ul style="list-style-type: none"> - Any release recorded as incident - serious events notified immediately - quarterly SF₆ performance (losses vs inventory) summarized in HM/WMP and ESMP reports
Training & awareness	Workers inducted (including waste & hazardous materials requirements)	100% workforce before accessing work front	<ul style="list-style-type: none"> - Induction logs maintained on a continuous basis - Monthly review 	<ul style="list-style-type: none"> - EPC HSE - PETDE PMT / OE verify 	<ul style="list-style-type: none"> - Induction registers attached to monthly HM/WMP report - coverage (% inducted) reported as a KPI - shortfalls and catch-up plan noted
	Relevant workers receive toolbox talks on waste/HM topics	At least 1 waste/HM toolbox talk per month per work front	Monthly	EPC HSE	<ul style="list-style-type: none"> - Toolbox talk records (topics, attendees) kept on file - monthly HM/WMP report shows talks held vs planned - OE/PETDE spot-check content and attendance during audits

Table 10-2. Operation Phase – HM/WMP KPIs, Monitoring and Reporting

Topic	KPI	Target (Minimum)	Monitoring Frequency	Responsibility	Reporting / Outputs
O&M waste management	Compliance of O&M storage yards and waste stores with HM/WMP standards (segregation, bunds, covers, labeling, housekeeping)	<ul style="list-style-type: none"> - All O&M stores compliant (Yes/No) - non-compliances closed within agreed timeframe 	<ul style="list-style-type: none"> - Monthly store checks - Biannual audits 	<ul style="list-style-type: none"> - Substation / OHTL O&M Supervisors - PETDE Environmental Unit 	<ul style="list-style-type: none"> - Monthly O&M inspection checklists maintained at site - Key findings and corrective actions summarized in biannual PETDE environmental reports and in any ESMP/OESMP updates
	Documented manifests and receipts for outgoing O&M waste	100% shipments documented	<ul style="list-style-type: none"> - Per-shipment review - Monthly summary 	<ul style="list-style-type: none"> - Substation / OHTL O&M - PETDE Environmental Unit 	<ul style="list-style-type: none"> - Manifests and receipts filed at substation and central PETDE level - Monthly manifest summary provided to PETDE Environmental Unit - Compliance status reflected in periodic reports to WB per ESCP
E-waste management	E-waste consigned only to authorized recyclers	100% e-waste consignments to authorized recyclers	Semi-annual review of e-waste log and recycler authorizations	<ul style="list-style-type: none"> - PETDE Environmental Unit - O&M Supervisor 	<ul style="list-style-type: none"> - E-waste register and recycler authorizations maintained - Semi-annual summary and any gaps reported by PETDE Environmental Unit in OESMP/O&M ESMP reporting
	Data wiping / destruction records for data-bearing equipment	Records kept for 100% data-bearing items	Semi-annual	<ul style="list-style-type: none"> - O&M Supervisor - PETDE IT / info-security as applicable 	<ul style="list-style-type: none"> - Data wipe / destruction certificates retained with e-waste files - Semi-annual control check documented by O&M and IT/info-security - Exceptions reported in PETDE internal compliance reports
SF ₆ recovery (O&M, if applicable)	SF ₆ maintenance interventions logged	100% interventions	<ul style="list-style-type: none"> - Each intervention - Quarterly summary 	<ul style="list-style-type: none"> - Certified Technician - O&M Supervisor 	<ul style="list-style-type: none"> - SF₆ intervention log attached to quarterly O&M ESMP/HM/WMP summary - Data feeds into annual GHG / SF₆ balance required under OESMP
	SF ₆ leak rate	Within OESMP target (as defined in OESMP / GHG management plan)	<ul style="list-style-type: none"> - As per OESMP (e.g., annual inventory and reconciliation) 	<ul style="list-style-type: none"> - PETDE O&M - PETDE Environmental Unit 	<ul style="list-style-type: none"> - Annual SF₆ mass balance and leak estimate reported in PETDE's annual environmental performance report and any WB-required GHG reporting
Supplier / recycler qualification	Approved destinations and recyclers list current and vetted	Approved list up to date (Yes/No)	<ul style="list-style-type: none"> - Semi-annual document review - Spot calls/visits 	PETDE Environmental Unit	<ul style="list-style-type: none"> - Updated "Approved Destinations and Recyclers List" maintained - Evidence of checks included in semi-annual internal reports - Any barred sites communicated to O&M and Contractors
	Use of barred or non-compliant sites	0 use of barred sites	<ul style="list-style-type: none"> - As above - Incident log 	PETDE Environmental Unit	<ul style="list-style-type: none"> - Any use of non-compliant sites recorded as incident - Corrective actions tracked - Reported in PETDE Environmental Unit's periodic ESMP implementation reports

11. TRAINING REQUIREMENTS

Required training topics:

- Hazardous materials awareness
- SDS interpretation
- Waste segregation
- Spill response
- SF₆ handling
- Transformer oil management
- Battery handling
- Asbestos awareness (short module)
- Fire safety
- Dangerous goods transport

All training documented; certificates required for SF₆ and asbestos specialists.

12. INTERFACE WITH OTHER SEEP INSTRUMENTS

This Plan directly interfaces with:

- OHS Plan Annex: PPE, exposure control, spill response
- Traffic Management Plan: transport of hazardous materials/waste
- Emergency Response Plan: major spills, fires, SF₆ leaks
- Chance-Finds Procedure: if contamination is discovered during excavation
- Guidance on Resettlement Plan/ Livelihood Restoration Plan (RP/LRP): preventing environmental damage during land access
- ESMPs (OHTL + Substations): activity-specific controls

13. TEMPLATES

During construction, Contractors shall develop and use these templates as part of their Construction Environmental and Social Management Plan (CESMP), subject to PETDE/PMT and OE review. For the O&M phase, PETDE O&M departments shall establish and use equivalent internal forms and registers consistent with this Annex before commissioning of rehabilitated assets.

1. Hazardous Materials Inventory Template
2. SDS Register Template
3. Weekly Storage Inspection Checklist
4. Waste Manifest Form
5. Spill Response Log

6. SF₆ Handling Log
7. Battery Management Log

14. PLAN REVIEW AND UPDATE

- Reviewed annually or after major incidents
- Updated when new materials or waste streams arise
- Changes must be approved by PETDE/PMT and OE