POPs stockpile Merkim site, Kocaeli, Turkey

Detailed site survey/assessment, operational planning, environment/safeguards assessment, training and supporting technical supervision related to the removal of POPs

Sub Task 3.5: Environmental Management Plan Requirements

10 January 2018

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Responsibility

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Contents

0 List of abbreviations

Contractor-EMP	Contractor Environmental Management Plan
DGSA	Dangerous Goods Safety Advisor
EMP	Environmental Management Plan
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
EWP	Execution Work Plan
MoEU	Ministry of Environment and Urbanization
HSC	Health and Safety Coordinator
OJ	Official Journal
OSS	Occupational Safety Specialist
SS	Site Supervisor
TMP	Traffic Management document
WPP	Workplace Physician

1 Introduction

1.1 General

The objective of this task is the preparation of an Environmental Management Plan requirements for the project design phase (further referred as EMP) that can serve as a reference document defining the requirements for the contractor to make his own project specific contractor EMP (further referred as Contractor`s EMP). This EMP serves as a reference for the contractor when preparing his bid for execution of the works, most specifically to provide insight for the contractor what is necessary to comply with Turkish legislative requirements and international best practise. Additionally it will serve as a part of the documentation related to UNDP and GEF safeguard requirements.

The works/the project concern the elimination of a POP-pesticides stockpile, the clean-up of the building containing it and the other site restoration works at Merkim site in Kocaeli, Turkey.

1.2 Location of the site

The Merkim site is located in the Sirintepe Region of Derince town in Kocaeli province, Western Turkey. Derince is a coastal town on the Northern shore of Izmit Bay. The official address of the site is Deniz mah. Petrol Office street Derince-Kocaeli. The cadastral annotation is: Layout no: 73, Plot no: 50 and Parcel no: 34. The location of Merkim POP-pesticides stockpile site in Kocaeli, Turkey is shown in Figure 1.1.

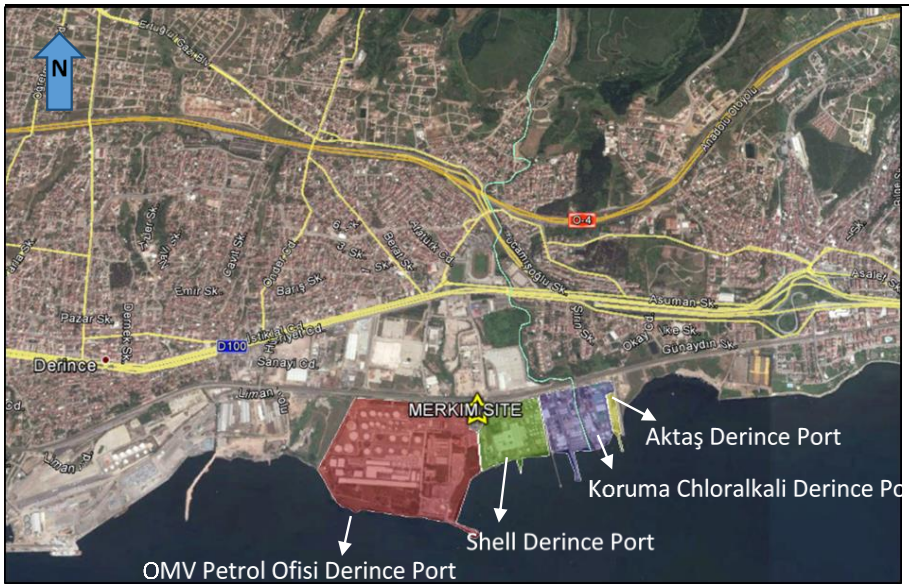

Figure 1.1 Location of Merkim POP-pesticides stockpile site (Source: Google Maps, 19 January 2017)

Approximate height of the site is 4 - 5 m above sea level. The site itself is located in an oxbow of the entry road to an industrial zone. The area is relatively flat, slightly sloping towards Izmit bay which is located some 250 m to the South. The closest hills are some 2 km north of the site. Directly North of the site is the high speed railroad Istanbul - Eskisehir, to the West is a new Mosque for the workers of nearby industrial facilities and a restaurant for tanker truck drivers. To the South and the West of the site are Petrol Ofisi tank storage areas, to the East of the site is the Shell Derince Dolum Tesisi tank storage and Koruma Klor Alkali San. ve Tic A Ş chemical factory. The nearest settlement is Deniz (sea) hometown that is approximately 350 m to the northeast. The planning status of the site is Industrial Land; there are no land-use restrictions for the area.

The Merkim site is approximately 8,000 m^2 in size and consists of six interlinked warehouses surrounded by unpaved outer areas. The entire site is enclosed by a 3 m high barbed wire fence in good condition. As of 2016 there is one main entrance to the interlinked warehouses, all other entry points have been sealed off. The outside walls and doors, except the main entrance, of the warehouses are sealed with foam concrete to reduce odour nuisance in the surrounding.

Of the six interlinked warehouses (see figure 1.2). Four warehouses (no 3, 4, 5 and 6) have the same configuration (20 x 30 m) with a maximum ceiling height of 8.18 m. The two Northern most warehouses (no 1 and 2) are smaller in size. A small underground storage (presumably an old septic tank) is located outside the Warehouse 1c (see Figure 1.2).

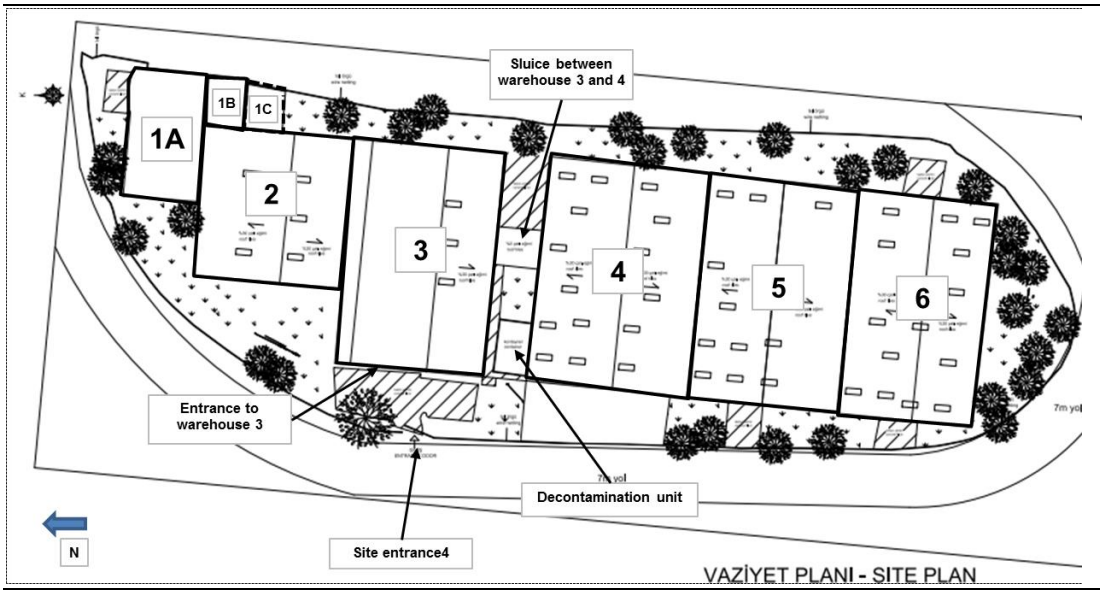

Figure 1.2 Site layout with indication of warehouse numbers and main features of the site

Inside the warehouses POP-pesticides are present in stockpiles, part of the POP-pesticides is present in plastic packaging materials (PE bags, paper bags with plastic liners) and part of the POP-pesticides has been repacked in metal open head drums mainly of 200 litres. The POP-pesticides are stored under substandard conditions, the warehouses are leaking and the entire warehouse is covered in a layer of POP-pesticides dust. All warehouse floors have a layer of cemented POP-pesticides and are covered in POP-pesticides dust as well as the walls, the rafters of the roof construction, the concrete pillars of the building skeleton and all equipment and other materials present. Total quantity of POP-pesticides wastes is estimated at 2218 tons, the total quantity of POP-pesticides impacted materials is estimated at 556 tons, for exact quantities please refer to Task 2 Site Description Survey and Assessment Report (Tauw report R003-1239389GMC-beb-V02-NL, 23 January 2017).

1.3 Contamination situation

POP-pesticides wastes
All materials inside the warehouses, as well as the concrete floors, the walls of warehouses and the soil underneath the floor are impacted by the long term storage of POP-pesticides wastes. Direct contact with materials in these parts of the site can potentially lead to exposure to high concentrations of POP-pesticides.

Representative POP-pesticides waste samples from the six different warehouses are analysed for α-HCH, β-HCH, γ-HCH, δ-HCH, 2,4'-DDT, 4,4'-DDT and 4,4'-DDD. According to the analytical results all pesticides encountered inside the warehouses are POP-pesticides. In most cases it concerns HCH production wastes with a purity of approximately 40 % (i.e. 40 % of the material is POP-pesticides, 60 % is inorganic mixture/filler). Limited quantities of the POP-pesticides are Technical HCH and DDT end products. Other materials inside the warehouses, machinery as well as the floors and the walls are covered in layers of POP-pesticides containing dusts. These materials should as such, from a health and safety perspective, be treated as if they are POP-pesticides. Concentration of total POP-pesticides of the wall blocks varies between 90 and 539 mg/kg (as measure for entire blocks), concentrations of POP-pesticides in concrete floor top layer varies between 113 and 18,363 mg/kg. These concentrations were measured after the removal of superficial dust. Concentration of POP-pesticides in the on-site soil outside the warehouses on site is 0.3 - 1,747 mg/kg with concentrations of concern being largely localized near the current site entrance.

Asbestos
Each warehouse has a gable roof made out of asbestos corrugated sheeting mounted on steel rafters, the rafters are resting on reinforced concrete skeleton of the building. The roof consists of Asbestos cement corrugated sheets with 10 - 15 % of the material consisting of Chrysotile asbestos. Between Warehouse 3 and 4 is a narrow corridor made of asbestos sheets with a roof made out of corrugated iron sheeting.

Other contaminants of concern
Samples of the soil directly underneath the warehouse floors contained high concentrations of Total Petrol Hydrocarbons (mineral oil) and to a lesser extent chrome. However as no works are envisaged underneath the warehouse floors and theses floors will be left in place after finalization of the works, as containment measure pending further investigation and separately initiated action as may be required. As a result, no further attention is given to these contaminants.

1.4 Site clean-up and restoration activities

The site clean-up and restoration consist of the following activities:

1. Preparation of the site including the installation of site zoning and implementation of cross-contamination prevention measures
2. Repacking of POP-pesticides into approved packaging materials for off-site transport
3. Separation, processing and packing of materials impacted by the storage of POP-pesticides for off-site transport
4. Removing and packing of POP-pesticides contaminated top layers of the warehouse floors and demolition and packing of POP-pesticides contaminated parts of the warehouse wall the for off-site transport
5. Demolition and loading in containers of remaining clean warehouse/building structures for off-site transport
6. Loading and off-site transport of POP-pesticides, POP-pesticides impacted materials and demolition wastes and clean demolition waste

1.5 Environmental Management Plan

The purposes of this EMP is to provide overall guidance for contractors in developing the Contractor`s EMPs that will ensure that: All adverse environmental impacts are within the acceptable level, according to subsequently prevention, control, monitoring and mitigation and that all aspects of the works comply with the relevant legislation, permit conditions and good practice, and that measures to mitigate the negative impacts identified are implemented.

This EMP describes the appropriate environmental controls and monitoring procedures during clean-up of the POP-pesticides stockpile and the other site restoration works. It is split in Environmental Mitigation and Environmental Monitoring measures.
The EMP is the basis for the project fulfilling the requirements under “Environment Law No. 2872”, which was published in the Turkish Official Gazette no. 18132 dated 11.08.1983 and amended By-Law no. 5491 dated 26.04.2006 and forms part of the Project`s fulfilment of its safeguards obligations as required by UNDP and GEF policies.

The purposes of the EMP prepared for the project are as follows:

1. To propose practical measures to prevent, minimize, mitigate or rehabilitate for identified adverse environmental impacts in the Environmental and Social Impact Assessment of the project
2. To propose monitor and manage measures such that the project is environmentally sustainable, with the least of impact and optimizes resource use

The scope of the EMP is given as follows:

1. Description of the detailed activities needed to achieve the objectives of the project
2. Explanation of the organization structures, roles, communication and reporting for environmental protection
3. Description of the link between the Contractor's EMP and associated legislative requirements

1.6 Legal Framework

The Project directly and through its contractors implementing the work should fulfil all the requirements of the statutory regulations relating to, the clean-up of the POP-pesticides stockpile and the other site restoration works, in the Government of Turkey. This should focus on the requirements in regard to compliance with all health and safety legislation including, without limitation, the rules and by-laws of the Government of Turkey and the current Environmental law no.2872, By-Laws, communiqué, circulars et cetera.

As part of the Environmental and Social Impact Assessment an overview of Turkish legislation considered for the environmental aspects of this project is provided.

1.7 Supporting Plans

According to By-law Environmental Impact Assessment (EIA) (O.J. 25.11.2014-29186), the entire project is exempted from Environmental Impact Assessment (EIA). Hence, an official EIA is not necessary, and the Izmit Provincial Directorate will only audit Project's conformance to environmental management requirements stipulated in the environmental legislation in force. Notwithstanding the above, an EIA and SIA have been developed for the project in compliance with the Safeguards requirements and policies adopted by UNDP and GEF.

The Contractor`s EMP developed using this project EMP as guidance will be part of a group of documents to be outlined in tender proposals and finalized contractually with successful contractors. These documents include:

- Health and Safety Plan (HASP)
- Emergency Response Plan (ERP)
- Transport Plan (TP)
- Execution Work Plan (EWP)

2 Organization and staffing

2.1 Statutory Understanding and Compliance

Contractors need to be committed to fulfil all the requirements of the statutory regulations relating to clean-up of the POP-pesticides stockpile and the other site restoration works, of Turkey, specifically in regard to compliance with all health and safety legislation including, without limitation, the rules and By-Laws of the Government of Turkey and the authorities having jurisdiction and all current environmental laws, By-Laws, Communiqué etc. be they national or local.

2.1.1 Availability of Documents

Contractor should be required to keep their own registers of all relevant regulations in their offices on the project site. These relevant regulations are also available during an audit to be conducted by any competent governmental entity.

2.1.2 Identification of Responsibilities

The Contractor`s EMP should include an organization identifying the personnel to be engaged for environmental protection. In this section the legally required positions are mentioned. These can be either appointed or assigned from contractor`s own staff for these positions (provided they have the necessary qualifications and certifications) or hired as certified third parties. The required positions are:

- In accordance with By-Law on Occupational Health and Safety In Construction Works (05.10.2013-28786) a *Health and Safety Coordinator* for the works should be appointed
- An *Environmental Officer* or environmental consulting firm, certified by the Ministry of Environment and Urbanization (MoEU) should be appointed for the environmental management of the project according to the By-Law on environmental officer, environmental management unit and environmental consultancy firm (O.J. 21.11.2013 – 28828)
- A *Dangerous Goods Safety Advisor* (DGSA) according to the By-Law on dangerous goods by road (O.J. 24.10.2013-28801) and Communiqué on Dangerous Goods Security Consultancy (dated O.J.22.05.2014-29007)
- An *Occupational Safety Specialist* (OSS) and *Workplace Physician* (WPP) according to Law on Business Health and Safety No:6331
- An *asbestos dismantling specialist* according to By-Law on Health and Safety Measures in the Works With Asbestos (O.J. 25.01.2013-28539)

Site owner might have selected staff for some or all of the positions mentioned and arrangements may be made under the contract to use such expertise.

3 Environmental management

3.1 Mitigation Measures

This EMP includes the design phase assessment of measures against environmental impacts that may occur during realization of the Project. However it should be the contractor's obligation contractually to make a full assessment of measures against environmental impacts based on the agreed technical specifications and Execution Work Plan and present agreed mitigation measures in the Contractors EMP.

Mitigation measures are aimed at first avoiding environmental impacts before they occur. If such avoidance is not applicable or possible, then the second aim is to minimize impacts.
For purposes of this EMP and the guidance it is intended to provide, mitigation measures are focussed on the following subjects:

1. General
2. Air
3. Noise
4. Odor
5. Soil and groundwater
6. Waste
7. HSE

In addition mitigation measures are further split according to the following:

1. Inside the warehouse
2. Outside the warehouse
3. Site surroundings

Table 3.1 gives the site mitigation measures based on the current design made as baseline and given in the Narrative description of the removal of POPs stockpiles and POP impacted wastes the Task 3.2 Deliverable, 'Detailed operational plan' with the Tauw Reference R004-1239389GMC-los-V01. Dated 10 February 2017.

Table 3.1 Site mitigation measures

Issue	Location	Mitigating Measures
General	All areas	• List and design Pollution Prevention measures as part of EWP for each contracted aspect of the Project
Air Quality	Inside	• Areas where processing of POP-pesticides wastes causes high dust formation are kept at pressure below surrounding areas • All staff, equipment and machinery leaving interior parts of the warehouse where high dust formation is common are cleaned • In all areas where eight hour time weighted average value (ZAOD-TWA) of the asbestos concentration in the air exceeds 0.1 fiber / cm^3, workers are equipped with adequate PPE and receive training. (According to By-Law on Health and Safety Precautions Regarding Asbestos Usage, O.J. 25.01.2013-28539 • Limiting speed of vehicles in areas covered by dust • Weekly cleaning of areas where no processing activities take place to remove POP-pesticides dusts
	Outside	• All staff, equipment and machinery leaving the interior parts of the warehouse are cleaned • No active airflow between in and outside parts of the site by using sluices for staff movements and transport of equipment and machinery • During droughts, transport areas that are not asphalted need to be watered • The load in all trucks leaving the site should be covered to prevent dust formation
	Site surroundings	• Warehouse roof and walls are kept as a containment until all POP-pesticides wastes and POP-pesticides impacted wastes have been removed • All equipment and machinery leaving the site needs to be cleaned • During droughts, transport areas that are not asphalted need to be watered • The load in all trucks leaving the site should be covered to prevent dust formation
Noise	In & outside	• The noise emitted from the activity such as demolition may not exceed the limit values set for the Organized Industrial Zone • Limit noise generation during religious festivities and agree upon noise generation with local Mosque • Acquire permit from Kocaeli Provincial Directorate of Environment and Urbanization for carrying out construction activities in evening and nighttime (between 07.00 and 19.00)

Issue	Location	Mitigating Measures
Odor	Inside	• No works below warehouse concrete floors except as specified for well and pits being cleaned • Areas where liquids are used are kept hydrologically separate from surroundings
	Outside	• Warehouse roof and walls are kept as a containment until all POP-pesticides wastes and POP-pesticides impacted wastes have been removed • Warehouse entrance and exit points are kept closed when not in use • Areas where equipment, materials or staff cleaning takes lace are kept covered when not in use.
Soil and groundwater quality	Outside	• Soil moving works will be scheduled so as to ensure that any excavation and backfilling operations coincide in a single operation, in order to minimize the quantity of material stored, transported and manipulated by heavy machinery. Where possible soil from within the site border is used for leveling • Geotextile is used to separate between clean materials and underlying soil • Clean and contaminated materials cannot mix • Areas where liquids are used are kept hydrologically separate from surroundings
Waste	In & outside	• Waste generation is kept to a minimum • Wastes cannot mix • Liquid wastes are stored separately and transported off-site by tanker truck • Contractor shall include waste management planning into his work and demolition plans for the site (according to the By-Law on waste management and By-law on the Control of Excavation Soil, Construction and Destruction Wastes) • Domestic wastewater is either send to the municipal sewerage network or collected and transported off-site to a waste water treatment plant • The contractor shall ensure that all relevant staff are trained in health and safety issue in relation to work with POP-pesticides and asbestos and use of personal protection equipment. • The contractor shall ensure that experienced site supervisors for Health and Safety, Asbestos and / or Dangerous goods are present during working times at the site • The contractor shall set up a health and safety organization before the implementation of the work

Issue	Location	Mitigating Measures
	Site surroundings	• All materials leaving the site are cleaned from soil, dust or other materials • Waste will only be transported off-site in their approved packaging materials and by companies licensed for the off-site transport of those specific waste types • Asbestos will only be transported off-site in their approved packaging materials and by companies licensed for the off-site transport of asbestos
HSE	Inside & outside	• During the execution of all works a supervisor will make sure that the HSE rules like zoning and use of PPE are respected by workers, project management staff and all visitors
	Site surroundings	• During the execution of all works a supervisor will make sure that no unauthorized person are entering the site • The public is warned by signs that the site is a site with hazardous waste and that entry is restricted • The site fence is kept intact and outside working hours the site is closed with a lockable • On the outside fence are signs with contact details in case danger

3.2 Monitoring Plan

A monitoring plan is prepared:

- To determine the effectiveness of management actions and to understand the actual residual impact of the project activities on the environment
- To commit that 'project activities have no permanent negative effect on environmental resources'

Data acquired during monitoring should be compared with national and international legislation items which are mentioned in EMP in order to check compliance.

The site monitoring is split between baseline monitoring (Table 3.2), monitoring during the execution of the works (Table 3.3) and monitoring after finalization of the works (Table 3.4).

Site monitoring should be further detailed/adjusted depending on the actual execution methods and contractors responsibilities, which the bidding documents will provide the necessary input for.

The monitoring is focussed on the following subjects:

1. Air Quality
2. Noise
3. Odor
4. Soil quality
5. Waste
6. HSE

In addition monitoring measures are further split according to the following:

1. Inside the warehouse
2. Outside the warehouse
3. Site surroundings

Table 3.2 Baseline monitoring

Item	Location	Parameter	Sampling points	Frequency	Analyses	Testing standards
Air Quality	Site surroundings	DDT, HCH,	• Mosque • Upwind 1 location maximum 100 m from site • Downwind 2 locations 100 and 200 m from site	Once prior to the start of the works	DDT, HCH in mg/m^3	Adjusted strategy from ISO 16000-13:2008 or ISO 16000-32:2014 or comparable Turkish standard
	Site surroundings Inside	Asbestos	• Mosque • Upwind 1 location maximum 100 m from site • Downwind 2 locations 100 and 200 m from site	Once prior to the start of the building demolition	Total asbestos in vibres / cm^3	ISO 14966:2002 or comparable Turkish standards
	In & outside & site surroundings	Particulate Matter	• Mosque • Upwind 1 location maximum 100 m from site • Downwind 2 locations 100 and 200 m from site	Once prior to the start of the building demolition	PM in mg/m^3	(TS) EN 12341 according to By-law on Assessment and Management of Air Quality (O.J.06.06.2008-26898)
Noise	Site surroundings	Noise levels	• Mosque • Upwind 1 location	Once prior to the start of the works	Noise levels (dB)	TS ISO 1996-2/TS ISO 1996- 2/T1

Item	Location	Parameter	Sampling points	Frequency	Analyses	Testing standards
			• Downwind 2 locations			
Odor	Site surroundings	Odor	• Mosque • Trucker restaurant • Upwind 1 location maximum 100 m from site • Downwind 2 locations 100 and 200 m from site	Once prior to the start of the works	Odor	(TS)EN 13725, TSE 13726 (by-law on By-law on Emissions Control Originated Odor (O.J. 19.07.2013-28712))
Soil and groundwater quality	Outside	Soil quality	• All areas to be classified as Zone 2 in project works	Once prior to the start of the works	DDT, HCH in mg/kg	One composite sample per 100 m^2 of exposed soil. Composite sample made from 5 manual borings till 30 cm minus ground level. Sampling according to By-Law on Soil Pollution Control and Areas Polluted by Point Sources (O.J. 08.06.2010-27605)
	Outside	Groundwater quality	• All three exterior groundwater wells	Once prior to the start of the works	DDT, HCH, Mono-chlorobenzenes in µg/l	Sampling according to By-Law on Soil Pollution Control and Areas Polluted by Point Sources (O.J. 08.06.2010-27605)
	Site surroundings	Soil quality	• Uncovered areas within 50 m from site fence	Once prior to the start of the works	DDT, HCH in mg/kg	One composite sample per 1,000 m^2 of exposed soil. Composite sample made from 5 manual borings till 30 cm –ground level. Sampling according to by-law on Soil Pollution Control and Areas Polluted by Point Sources (O.J. 08.06.2010-27605)

Item	Location	Parameter	Sampling points	Frequency	Analyses	Testing standards
Waste		POP-pesticides	•			Not applicable
		POP-pesticides impacted waste	•			
		Scrap metal	•			
		Rubble	•			
		Other building material	•			
HSE	Out & inside	Asbestos exposure	• All staff	Once prior to start of works with asbestos containing materials	Standard radiographs	To be determined by workplace physician
	Out & inside & site surroundings	Health status	• All staff	Once prior to the start of the works	Health check	To be determined by workplace physician

Table 3.3 Execution monitoring

Item	Location	Parameter	Sampling points	Frequency	Analyses	Testing standards
Air Quality	Inside	DDT, HCH	• One in Zone 2 at 1.5 m above site floor	Monthly	DDT, HCH in mg/m^3	Adjusted strategy from ISO 16000-13:2008 or ISO 16000-32:2014
		Particulate Matter	• Next to all activities generating high levels of dust	Continuously during working hours	Total PM in mg/m^3	TS 2361 Continuous automatic testing. Equipment sensitivity minimum 5 mg/m^3
		Air Pressure	• In all areas kept at air pressure below outdoor pressure	Daily	Air pressure reading	Equipment sensitivity minimum 1 Pascal
		Carbon Monoxide	• In all areas where combustion engines are used	Continuously during working hours	On-site testing for CO concentration in air	Continuous automatic measurement with BS EN 50545-1:2011+A1:2016 approved CO-meter (with alarm)
		Asbestos	• One in each space where and when asbestos removal takes place	Monthly during the removal of asbestos containing materials	Total asbestos in vibres / cm^3	Fibre count using phase-contrast according to By-law on-By-law on Health and Safety Precautions Regarding Asbestos Usage, (O.J.25.01.2013-28539) Asbestos: NIOSH-NMAM 7400, NIOSH-NMAM 7402 (for Air Quality Indoor Environment)
	Outside	DDT, HCH	• One in Zone 2 at 1.5 m above site	Quarterly	DDT, HCH in mg/m^3	Adjusted strategy from ISO 16000-13:2008 or ISO 16000-32:2014

Item	Location	Parameter	Sampling points	Frequency	Analyses	Testing standards
			floor next to site entrance			
	Site surroundings	DDT, HCH	• One at Mosque • One 50 m downwind of the site	Quarterly	DDT, HCH in mg/m^3	Adjusted strategy from ISO 16000-13:2008 or ISO 16000-32:2014
		Particulate Matter	• Mosque • Downwind 1 locations 100 m from site	Once during the main demolition phase of the building	PM in mg/m^3	(TS) EN 12341 according to By-law on Assessment and Management of Air Quality (O.J.06.06.2008-26898)
Noise	Inside	Noise	• In areas with excessive noise	Only in case of excessive noise	Noise dB	TS 2607 ISO 1999, For Noise for interior parts (work hygiene)
	Outside	Noise	• In areas with excessive Noise	Only in case of excessive noise	Noise dB	TS ISO 1996-2/TS ISO 1996- 2/T1
	Site surroundings	Noise	• Mosque • Restaurant	Only in case of excessive noise or complaints	Noise in dB	TS ISO 1996-2/TS ISO 1996- 2/T1 according to By-law on Assessment and Management of Environmental Noise (O.J. 04.06.2010- 27601 amended O.J. 18.11.2015-29536)
Odor	Site surroundings	Odor	• Mosque • Trucker restaurant • Upwind 1 location maximum 100 m from site • Downwind 2 locations 100 and 200 m from site	Monthly during the works	Odor	Subjective testing by interviewing inhabitants or workers. Focus on odor coming from POP-pesticides only. In case of complaints (TS)EN 13725, TSE 13726 according to by-law on By-law on Emissions Control Originated Odor (O.J. 19.07.2013-28712)

Item	Location	Parameter	Sampling points	Frequency	Analyses	Testing standards
Soil and groundwater quality	In & outside & surroundings	Not applicable				
Waste	Inside	POP concentration	• All concrete blocks from the walls	Per 20 tons for clean or moderately impacted building blocks Per 10 tons for severely impacted building blocks	HCH, DDT in mg/kg dry matter	Sampling based on the following strategy (Based on BRL 1000 VKB protocol 1003): • One mixed samples of minimum 15 kg • One mixed sample consists of 24 individual grabs from collected wastes maximum grab weight of 10 kg • Individual grabs collected wastes should be done in such a way that they are representative of the entire waste stream
			• Concrete from site floors in layers of 0.5 cm	Testing per 20 tons maximum and per 4 tons minimum	HCH, DDT in mg/kg dry matter	Sampling based on the following strategy (Based on BRL 1000 VKB protocol 1003): • One mixed samples of minimum 15 kg • One mixed sample consists of 24 individual grabs from collected wastes maximum grab weight of 10 kg. • Individual grabs collected wastes should be done in such a way that they are representative of the entire waste stream
		Dry weight	• Wet POP-pesticides	On-site testing per 2 tons dried POP-pesticides	Dry weight (kg/m^3)	ASTM D2216 or Turkish standards

Item	Location	Parameter	Sampling points	Frequency	Analyses	Testing standards
	In & outside & surroundings	Discharge characteristics	• All liquids	Per bulk unit (IBC unit of tanker truck). Maximum 20 m^3	Heavy metals, DDT, HCH and all other requirements according to (O.J. 26.11.2005-26005)	NEN 5860 (in case effluent points are present, sampling can also be done in accordance with ASTM D 4057)
HSE	In & outside	Use of PPE	• All staff	Continuously	Use of correct PPE	Monitoring by site supervisors
		Zoning	• All staff	Continuously	Correct use of zoning	Monitoring by site supervisors

Table 3.4 Final monitoring

Item	Location	Parameter	Sampling points	Frequency	Analyses	Testing standards
Air Quality	In & outside & surroundings	Not applicable				
Noise	In & outside & surroundings	Not applicable				
Odor	In & outside & surroundings	Not applicable				
Soil and groundwater quality	Inside	POP-pesticides	Entire site	Once after finalization of the works	Visual inspection	Visual inspection of site for presence of POP-pesticides residue adapted from ASTM E1368
		Asbestos	Entire site	Once after finalization of the works	Visual inspection	According to ASTM E1368
	Outside	Soil quality	Verification of quality of all areas sampled in baseline	Once prior to the start of the works	DDT, HCH in mg/kg	One composite sample per 100 m^2 of exposed soil. Composite sample made from 5 manual borings till 30 cm minus ground level
		Asbestos	Entire site	Once after finalization of the works	Visual inspection	According to ASTM E1368

Item	Location	Parameter	Sampling points	Frequency	Analyses	Testing standards
		Groundwater quality	All three exterior groundwater wells	Once after finalization of the works	DDT, HCH, Monoclohoro benzenes in µg/l	According to Turkish legislations
	Site surroundings	Soil quality	Verification of quality of all areas sampled in baseline	Once prior to the start of the works	DDT, HCH in mg/kg	One composite sample per 1,000 m^2 of exposed soil. Composite sample made from 5 manual borings till 30 cm minus ground level
Waste	In & outside & surroundings	Not applicable				
HSE	In & outside	Health status	All staff	Once after finalization of the works	Health check	To be determined by workplace physician
		Asbestos exposure	All staff	Once after finalization of the works	Standard radiographs	To be determined by workplace physician

4 Reporting procedures and communications

4.1 Environmental Reports

The following environmental reports should be prepared during execution of the Project:

- Daily environmental non-compliance report (if any)
- Weekly Environmental Reports containing environmental problems occurred during that week and precautions taken
- Monthly environmental monitoring reports in which environmental performance of the Project is evaluated according to EMP requirements

Results should be compared with Turkish legal limiting values as a minimum reference value. In case more stringent values are given in Table 3.2 - 3.4 or in any other part of the tender documentation, these apply as minimum values. In case airborne DDT and/or HCH are measured in the site or in the site surroundings a risk assessment using Turkish and international standards should be executed to assess risks associated with airborne DDT and/or HCH dusts. In case DDT and/or HCH is measured in soils outside the site risk assessment using the US EPA RBCA model should be done to assess risks. Further steps for Environmental Monitoring and Mitigation will be determined based on the outcomes of the risk assessment.

4.2 Notification of Accidents

The client's supervisor will be notified immediately of any accidents which occur whether on-Site or off-site in which the contractor, his staff or those of any subcontractors are directly or indirectly involved and which result in any injuries to any persons.

Such initial notification may be verbal and will be followed by a written comprehensive report within 24 hours of the accident.

4.3 Communications

The means by which environmental and safety management will be communicated to all staff including subcontractors at all levels and their due compliance with the EMP and all relevant statutory regulations will be ensured by the contractor. Supervisor staff and subcontractor supervisors will be supplied with copies of the EMP. Additional activities may include attendance at project specific training programs, toolbox meetings and the daily start work analyses, circulation of newsletters and other means.

The scope of the training will include mainly the scope of the EMP, the relevant environmental legislation of Turkey and the following concepts should be included in the training program:

- Understanding of the project's environmental requirements and their implementation at the site by the staff (i.e. what kind of environmental impacts are expected and what kind of mitigation measures are proposed; where and how to take these measures)
- Understanding of the procedures to be followed in improper situations
- Reporting principals and understanding rules
- The project's environmental dimension and informing the related official institutions about it
- Understanding how to treat the public and media visiting the site
- Understanding how to act in case of unexpected environmental accidents

4.4 Inspections

Inspections will be conducted quarterly during project execution. Contractor's supervisor together with the client's supervisor will examine the relevant issues. The inspections will focus on checking compliance of project activities with the requirements set forth by the mitigation plan and monitoring program presented in EMP. Follow-up inspections will be carried out to ensure that the necessary corrective and preventive measures are taken at the suitable time.

The Project Supervision and Contractor will take all the necessary measures towards ensuring on-going improvement of the EMP.

4.5 Communication with external parties

After consultation with the client, and upon their request only, the contractor may organize a meeting with responsible authorities in the environmental field to give the information about the environmental performance of the project.