

ANNEX H

Waste Management Plan

1.0 SCOPE AND PURPOSE OF THE WASTE MANAGEMENT PLAN

The HEMA Hard Coal Mine Project has been proposed by the Hattat Enerji ve Maden Ticaret A.Ş which includes two coal washing plants and a port. This Waste Management Plan (WMP) describes how waste that will be generated during the construction and operation phases of the Project will be managed. The aims of the WMP are to:

- Minimize the potential to cause harm to human health and the environment;
- Achieve and maintain compliance with Turkish regulations, and follow guidelines of the International Finance Corporation (IFC);
- Reduce operational costs and reduce any potential liabilities that may arise from waste handling operations.

This WMP identifies wastes that are likely to be generated during the construction and operation of the mine, coal washing plants and the port and documents the waste management practices to be employed for their collection, segregation, labelling, storage, transfer to waste management facilities.

2.0 LEGAL AND OTHER REQUIREMENTS

Table 1 sets out the key national regulations that are applicable to waste management for the Project.

Table 1: Key national regulations

Regulation	Official Gazette Date/Number
Regulation on General Principles of Waste Management	05.07.2008/26927
Law of Aquaculture Numbered 1380	04.04.1971/13799
Regulation on Aquaculture	10.03.1995/22223
Water Pollution Control Regulation	31.12.2004/25687
Regulation on Environmental Permits and Licenses	29.04.2009/27214
Regulation on Controlled Landfilling of the Wastes	26.03.2010/27533
Urban Wastewater Treatment Regulation	08.01.2006/26047
Regulation on Control of Excavated Soil, Construction and Demolition Wastes	18.03.2004/25406
Hazardous Waste Control Regulation	14.03.2005/25755
Solid Waste Control Regulation	14.03.1991/20814
Packaging Waste Control Regulation	24.08.2011/28035
Waste Oil Control Regulation	30.07.2008/26952
Regulation on Control of Waste Batteries and Accumulators	31.08.2004/25569
Medical Waste Control Regulation	22.07.2005/25883
Regulation on Control of Waste Vegetable Oils	19.04.2005/25791
Regulation on Reception of Ship-Generated Waste and Waste Control	26.12.2004/25682
Communiqué on Road Transportation of Wastes	18.01.2013/28532
Regulation on Control of Waste Electrical and Electronic Equipment	22.05.2012/28300
Communiqué on Recycling of Certain Non-hazardous Wastes	17.06.2011/27967
Regulation on Control of End of Life Tires	31.08.2004/28817
Draft Regulation on Mine Waste	-

In addition to the Turkish Environmental Legislation, waste management practices for the Project will also need to abide with the following IFC Guidelines:

- IFC General Environmental, Health and Safety Guidelines
- IFC Environmental, Health and Safety Guidelines for Mining
- IFC Environmental, Health and Safety Guidelines for Ports, Harbors, and Terminals
- IFC Environmental, Health and Safety Guidelines for Waste Management Facilities

3.0 WASTE MANAGEMENT

3.1 General Principles

The Waste Management Strategy of the Project will be based on Waste Management Hierarchy which aims to produce minimum waste to be sent for final disposal. The hierarchy consists of the following options with priority sequence:

- Prevention – Avoid to generate waste
- Reduction – Minimize the waste generation
- Reuse – Reuse the waste materials
- Recycling and recovery – Convert the waste into usable materials and recover the energy content of waste
- Treatment – If the previous options are not possible then treat the waste before final disposal
- Storage – Store the waste safely prior to final disposal according to the required techniques
- Disposal – Dispose the waste in environmentally acceptable manner at final location/facility.

The basic waste reduction methods should include:

- Environmentally friendly and recyclable products should be chosen during material supplying in order not to dispose the waste as hazardous or special waste,
- Re-use of materials as appropriate,
- Purchase materials that have the least amount of packaging, to minimize packaging waste generation,
- Arrange for just in time deliveries to reduce storage and material losses,
- Examine the work method for each activity and identify alternative ways that eliminate or reduce wastes,
- Substitute materials that will help reduce waste produced,
- Avoid equipment containing mercury, PVCs, VOCs, PBT compounds and products that contain carcinogenic, mutagenic and teratogenic substances,
- Properly segregate all waste classes,
- Handle with care when transferring chemicals to minimize spills,
- Improve transport procedures to reduce damage to materials,
- Use of efficient stock management practices and monitoring
- Totally spend the chemicals in the container.

3.2 Waste Generation

Waste generation amounts during construction and operation with their disposal methods are given in Table 2 and Table 3, respectively. All the licensed waste management facilities in Bartın and the surrounding cities, which can collect the different type of waste generated during the construction and operation phase of the project, are given in Table 4.

Table 2: Types of waste and proposed management practices during construction phase of the Project

Waste Class	Waste Type	Waste Code	Characteristics	Governing Regulation	Storage and Treatment Prior to Disposal	Final Disposal	Risks
DOMESTIC WASTE	Solid Waste	20 03 01	Non-hazardous- Household waste from the camp sites	Solid Waste Control Regulation (OG Date/Number: 14.03.1991/20814)	Being collected in waste containers on-site (400 L or 800 L) and then hauled to Bartın Dump Site	Solid Waste trucks/ Bartın Dump Site	Medium Risk. Hauling of the waste needs to be organized
	Domestic Wastewater	20 03 01	Generated by workers at the campsites and during construction activities (estimated as 190 m ³ /day)	Water Pollution Control Regulation (OG Date/Number: 31.12.2004/25687)	Currently being discharged to septic tanks. Will be treated in Package biological wastewater treatment plants (WWTP) to be installed at a later stage.	The effluent of the WWTP will be discharged to the point where Capak and Gomu Creeks merge.	Medium Risk. WWTPs are still not in operation.
	Domestic wastewater treatment sludge	19 08 05	Semi-solid slurry due to treatment of domestic wastewater	Law of Aquaculture No. 1380 (OG Date/Number: 04.04.1971/13799) Regulation on Aquaculture (OG Date/Number: 10.03.1995/22223)	Will be dried on drying beds and stored	Appropriate disposal method in compliance with the related regulations will be decided later on.	Medium Risk. Planning should be made before the construction of the plants are completed.

Waste Class	Waste Type	Waste Code	Characteristics	Governing Regulation	Storage and Treatment Prior to Disposal	Final Disposal	Risks
INDUSTRIAL WASTEWATER	Industrial wastewater		Generated due to gallery advancement, drilling equipment, concrete spraying, etc. (estimated to be 257 m ³ /day)	Water Pollution Control Regulation (OG Date/Number: 31.12.2004/25687) Law of Aquaculture No. 1380 (OG Date/Number: 04.04.1971/13799) Regulation on Aquaculture (OG Date/Number: 10.03.1995/22223)	%30 of the industrial is recovered and the rest is absorbed in the excavated material	Recovered wastewater is reused in the mining activities	Medium risk. The industrial wastewater leach to the soil when disposed onto the grounds near shaft areas.
PACKAGING WASTE	Metal, Glass, Plastic packaging waste	15 01 04 (metal)	Non-hazardous - Generated from packaging of products brought to the site that will	Packaging Waste Control Regulation (24.07.2007/26562)	Being collected in waste bins	HEMA Çerkezköy Facility	Low Risk. Facility is already in use and has adequate capacity to receive the waste.
		15 01 07 (glass)	include certain plastic materials, Non-hazardous-	Communiqué on Non-hazardous and Inert Waste Recycling (OG Date/Number: 12.05.2010/27579)			
		15 01 02 (plastic)	Metal waste shall be disposed separately for reuse and recycling.				
HAZARDOUS WASTE	Chemicals		Hazardous waste can mainly be generated during maintenance of vehicles.	Hazardous Waste Control Regulation (OG Date/Number: 14.03.2005/25755)	Separately being collected in waste drums/ containers, labeled, stored in waste storage area at dedicated section, and delivered to licensed companies. Maximum temporary storage period is 6 months.	Petder (Petroleum Trade Association)/ Çetinkaya Automobile Accessories and tires	Low Risk. Hazardous waste collection, transport and disposal are common practice that is well regulated by MEUP.
	Contaminated filters, fabrics	15 02 02*					

Waste Class	Waste Type	Waste Code	Characteristics	Governing Regulation	Storage and Treatment Prior to Disposal	Final Disposal	Risks
	Contaminated packaging	15 01 10*					
SPECIAL WASTE	Waste Mineral Oils	13 01 ... 13 02 ... Code to be defined based on type of waste oil	Hazardous materials- Generated from upkeep and use of construction equipment	Waste Oil Control Regulation (OG Date/Number: 30.07.2008/26952)	Waste oils are analyzed to be segregated and stored based on their categories and delivered to licensed company.	Golteks Petrol ve Kimya San. Tic. Ltd. Şti.	Low Risk. Waste oil collection, transport and disposal recycling are common practice that is well regulated by MEUP.
	Waste Batteries	20 01 33*	Generated from construction equipment used at the site	Regulation on Control of Waste Batteries and Accumulators (OG Date/Number: 31.08.2004/25569)	Being separately collected in battery box and then delivered to a licensed company	TAP (Transportable Battery Producers Association)	Low Risk since this is an established practice and the waste batteries and accumulators will not represent a large increase in the existing waste stream.
	Waste Accumulators	16 06 01*			Being separately stored in on-site hazardous waste storage area up to 90 days and then delivered to a licensed company	TAP (Transportable Battery Producers Association)	
	Waste Vegetable Oils	20 01 25	Generated from food processing in the cafeterias	Regulation on Control of Waste Vegetable Oils (OG Date/Number: 19.04.2005/25791)	Contractor which provides the food service takes care of the waste vegetable oils	Balaban Tekstil, Mak. Nak. Kimya, Gıda, İnş. San. ve Tic. Ltd. Şti.	Low Risk. Recycling companies has an effective collection and processing system.

Waste Class	Waste Type	Waste Code	Characteristics	Governing Regulation	Storage and Treatment Prior to Disposal	Final Disposal	Risks
EXCAVATION WASTE	Waste rock / Excavated soil <i>Source:</i> Levelling and excavation for foundations	01 01 02 17 05 04	Non-hazardous material- Generated during shaft constructions and gallery advancements	Regulation on Control of Excavated Soil, Construction and Demolition Wastes (OG Date/Number: 18.03.2004/25406) Regulation on General Principles of Waste Management (OG Date/Number: 05.07.2008/26927)	Some part was used for levelling of the Project site Currently being placed in waste rock dump sites.	Waste rock dump sites	Major Risk. Forestlands around Shaft-1 has been used as waste rock dump sites without an environmental permit. The waste rock consisting of mining debris may have acid generating potential since during the mining of coal, sulphides may oxidized with air and water and generate sulphuric acid. The resulting mine drainage is generally characterized by highly acidic waters with elevated metal and sulphate concentrations. Therefore environmental permit should be applied and necessary precautions should be taken at once.
MEDICAL WASTE	Infectious waste, Sharps waste	18 01 01* 18 01 03* 18 02 01* 18 02 02*	Generated from infirmary during construction	Medical Waste Control Regulation (OG Date/Number: 22.07.2005/25883)	Stored in medical waste bags.	Collection by Ilke Temizlik / Sending to Ilke-Rohan Sterilization Facility in Zonguldak	Low Risk. Waste generation amounts are negligible and waste is already being delivered to the sterilization facility.

Table 3: Waste types and proposed management practices during operation phase of the Project

Waste Class	Waste Type	Waste Code	Characteristics	Governing Regulation	Storage and Treatment Prior to Disposal	Final Disposal	Risks
DOMESTIC WASTE	Solid Wastes	20 03 01	Non-hazardous- Household waste from the camp sites	Solid Waste Control Regulation (OG Date/Number: 14.03.1991/20814)	Will be collected in waste containers on-site (400 lt or 800 lt) and then hauled to Bartın Dump Site	Solid Waste trucks/ Bartın Dump Site	Medium Risk. Hauling of the waste needs to be organized.
	Domestic Wastewater		Generated by workers at the campsites and during construction activities (estimated as 533 m ³ /day)	Water Pollution Control Regulation (OG Date/Number: 31.12.2004/25687)	Will be treated in Package biological wastewater treatment plants (WWTP).	The effluent of the WWTP will be discharged to the point where Capak and Gomu Creeks merge.	Medium Risk. WWTPs are still not in operation.
	Domestic wastewater treatment sludge	19 08 05	Semi-solid slurry due to treatment of domestic wastewater	Law of Aquaculture No. 1380 (OG Date/Number: 04.04.1971/13799) Regulation on Aquaculture (OG Date/Number: 10.03.1995/22223)	Will be dried on drying beds and stored	Appropriate disposal method in compliance with the related regulations will be decided later on.	Medium Risk. Planning should be made before the construction of the plants are completed.

Waste Class	Waste Type	Waste Code	Characteristics	Governing Regulation	Storage and Treatment Prior to Disposal	Final Disposal	Risks
INDUSTRIAL WASTEWATER	Industrial wastewater		Generated due to gallery advancement, drilling equipment, concrete spraying, etc. (estimated to be 1201 m ³ /day)	Water Pollution Control Regulation (OG Date/Number: 31.12.2004/25687)	Will be treated in four serial tanks with each has 250 m ² area in the Shaft-1 area.	Details of the Industrial Wastewater Treatment Plant will be decided later on.	Major Risk. Discharge values should be complied with the limits defined in the regulation (Table 7.2).
		Law of Aquaculture No. 1380 (OG Date/Number: 04.04.1971/13799)					
		Regulation on Aquaculture (OG Date/Number: 10.03.1995/22223)					
PACKAGING WASTE	Metal, Glass, Plastic packaging waste	15 01 04 (metal)	Non-hazardous - Generated from packaging of products brought to the site that will include certain plastic materials, Non-hazardous-Metal wastes shall be disposed separately for reuse and recycling.	Packaging Waste Control Regulation (24.07.2007/26562)	Will be collected in waste bins	HEMA Çerkezköy Facility	Low Risk. Facility is already in use and has adequate capacity to receive the waste.
		15 01 07 (glass)					
		15 01 02 (plastic)					
HAZARDOUS WASTE	Chemicals Contaminated filters, fabrics	15 02 02*	Hazardous wastes can mainly be generated during maintenance of vehicles.	Hazardous Waste Control Regulation (OG Date/Number: 14.03.2005/25755)	Will be separately collected in waste drums/ containers, labeled, stored in waste storage area at dedicated section, and delivered to licensed companies. Maximum temporary storage period is 6	Petder (Petroleum Trade Association)/ Çetinkaya Automobile Accessories and tires	Low Risk. Hazardous waste collection, transport and disposal are common practice that is well regulated by MEUP.

Waste Class	Waste Type	Waste Code	Characteristics	Governing Regulation	Storage and Treatment Prior to Disposal	Final Disposal	Risks
	Contaminated packaging	15 01 10*			months.		
	Waste Mineral Oils	13 01 ... 13 02 ... Code to be defined based on type of waste oil	Hazardous materials-Generated from upkeep and use of construction equipment	Waste Oil Control Regulation (OG Date/Number: 30.07.2008/26952)	Waste oils will be analyzed to be segregated and stored based on their categories and delivered to licensed company.	Golteks Petrol ve Kimya San. Tic. Ltd. Şti.	Low Risk. Waste oil collection, transport and disposal recycling are common practice that is well regulated by MEUP.
SPECIAL WASTE	Waste Batteries	20 01 33*	Generated from construction equipment used at the site	Regulation on Control of Waste Batteries and Accumulators (OG Date/Number: 31.08.2004/25569)	Will be separately collected in battery box and then delivered to a licensed company	TAP (Transportable Battery Producers Association)	Low Risk since this is an established practice and the waste batteries and accumulators will not represent a large increase in the existing waste stream.
	Waste Accumulators	16 06 01*			Will be separately stored in on-site hazardous waste storage area up to 90 days and then delivered to a licensed company	TAP (Transportable Battery Producers Association)	
	Waste Vegetable Oils	20 01 25	Generated from food processing in the cafeterias	Regulation on Control of Waste Vegetable Oils (OG Date/Number: 19.04.2005/25791)	Contractor which provides the food service will take care of the waste vegetable oils	Balaban Tekstil, Mak. Nak. Kimya, Gıda, İnş. San. ve Tic. Ltd. Şti.	Low Risk. Recycling companies has an effective collection and processing system.

Waste Class	Waste Type	Waste Code	Characteristics	Governing Regulation	Storage and Treatment Prior to Disposal	Final Disposal	Risks
EXCAVATION WASTE	Waste rock / Excavated soil	01 01 02 17 05 04	Non-hazardous material- Generated during shaft constructions and gallery advancements	Regulation on Control of Excavated Soil, Construction and Demolition Wastes (OG Date/Number: 18.03.2004/25406) Regulation on General Principles of Waste Management (OG Date/Number: 05.07.2008/26927)	Will be placed in waste rock dump sites.	Waste Rock Dump Sites near Shaft-1 and Shaft-2	Major Risk. Forestlands around Shaft-1 has been used as waste rock dump sites without an environmental permit. The waste rock consisting of mining debris may have acid generating potential since during the mining of coal, sulphides may oxidized with air and water and generate sulphuric acid. The resulting mine drainage is generally characterized by highly acidic waters with elevated metal and sulphate concentrations. Therefore environmental permit should be applied and necessary precautions should be taken at once..
MEDICAL WASTE	Infectious waste, Sharps waste	18 01 01* 18 01 03* 18 02 01* 18 02 02*	Generated from infirmary during construction	Medical Waste Control Regulation (OG Date/Number: 22.07.2005/25883)	Will be stored in medical waste bags.	Collection by Ilke Temizlik / Sending to Ilke-Rohan Sterilization Facility in Zonguldak	Low Risk. Waste generation amounts are negligible and waste is already being delivered to the sterilization facility.
COAL PROCESSING WASTE (SPOIL)	Coal Processing Waste	01 04 .. Code to be defined based on waste type	Non-hazardous- Inert materials such as earth and rock Non-hazardous /Hazardous- Cake material from thickener and filter press	Regulation on General Principles of Waste Management (Official Gazette (OG) Date/ Number: 05.07.2008/26927)	Will be placed on the spoil dump sites which will be equipped with low-permeability landfill liners a leachate drainage and collection system, and landfill cover	Spoil Dump Site 1 and 2	Major Risk. The spoil, resulting from the coal processing consists of mining debris which may have acid generating potential since during the mining of coal, sulphides may oxidized with air and water and generate sulphuric acid. The resulting mine drainage is generally characterized by highly acidic waters with elevated metal and sulphate concentrations. Soils on which the spoil dump sites located are

Waste Class	Waste Type	Waste Code	Characteristics	Governing Regulation	Storage and Treatment Prior to Disposal	Final Disposal	Risks
							mostly sensitive forest lands. Therefore, necessary protection should be provided.
SHIP-GENERATED WASTE	Bilge water Contaminated water Remains of bulk cargo	Code to be defined based on waste type	Generated due to engine of the ship and shipping activities	Regulation on Reception of Ship-Generated Wastes and Waste Control (OG Date/Number: 26.12.2004/25682)	Will be accepted by HEMA port, segregated and stored based on their categories in the 'waste reception facility' and then delivered to a licensed company	The procedures of Bartın Port will be followed.	Low Risk. An Environmental Permit is necessary for the Waste Reception Facility.

Table 4: Licensed Waste (Recycling / Disposal) Facilities located near Bartın Province

Facility Name	Facility Address	License Type	License Due Date
Zonguldak İl Özel İdaresi ve Belediyeler Birliği Tıbbi Atık Sterilizasyon Tesisi	Sofular Köyü Tombaklar Mevkii Zonguldak Tel:05056860072 Fax:03124474012	Medical Waste Sterilization	28.09.2016
Oyka Kağıt Amb.San.Tic.A.Ş.Çaycuma Şubesi	Perşembe Yolu Üzeri Zonguldak Tel:03726151182 Fax:03726151181	Packaging Waste Recovery	21.06.2017
Cantekinler Geri Dönüşüm Hurdacılık Taşımacılık Metal San. ve Tic. Ltd. Şti. Hışıroğlu Mevkii Şb.	İsmetpaşa Mahallesi Dibek Çayı Yöresi Devrek, Zonguldak Tel:03725564885 Fax:03725567223	Packaging Waste Collection and Separation	03.07.2017
Ünlüler Geri Dönüşüm Kağıt Petrol Ürünleri Hurda Plastik Kauçuk Nak. San. ve Tic. Ltd. Şti.	Sofular Köyü Tombaklar Mevkii Zonguldak Tel:03722513358 Fax:03722513358	Packaging Waste Collection and Separation	31.07.2017
Lafarge Ereğli Çimento Sanayi Ve Ticaret A.Ş.	Kırmacı Mah. Hasan Canver Cad. No:51 Ereğli/Zonguldak Tel:3723151500 Fax:3723151515	Non-hazardous Waste Recovery	14.11.2018
Ervaksan Erdemir Vakfı Metal San. ve Tic. A.Ş. Demir Çelik Yan Sanayi Ve Depolama Tesisi - Alaplı Şubesi	Aşağıdoğancılar Köyü Aktarılan Köy Sokağı 6. Cadde No: 89 Zonguldak Tel:03723785053 Fax:03723785052	Scrap Metal Recovery	04.04.2019
Albin-O Geri Dönüşüm San.İth.ve İhr. Ltd.Şti.	Baraj Yolu 3.Km. Kastamonu Tel:03662122137 Fax:03662122138	Packaging Waste Collection and Separation	13.02.2018
Tayaş Alternatif Yakıtlar Pazarlama Sanayi Tic A.Ş.	Samsun Karayolu 5.Km Yok Tosya Kastamonu Tel:3663130411 Fax:3663130412	Waste Vegetative Oil Recovery	25.04.2018
Beste Geri Dönüşüm İnşaat Nak.San.Ve Tic .Ltd.Şti.	İnönü M. Sanayi S.Sitesi 4.Sk. 1 Merkez Kastamonu Tel:3662145869 Fax:3662144303	Packaging Waste Collection and Separation	03.10.2018
Era Çevre Teknolojileri Anonim Şirketi (Kasmib Tıbbi Atık Sterilizasyon Tesisi)	Katı Atık Depolama Sahası Sarıyonca Köyü Harmanarkası Mevkii Kastamonu Tel:3666383800 Fax:3666383801	Medical Waste Sterilization	27.12.2018

Facility Name	Facility Address	License Type	License Due Date
Safran Ambalaj Atığı Toplama Ve Ayırma	Safranbolu Küçük Sanayi Site Bitişiği Karıt Köyü Girişi Safranbolu/Karabük Tel:05445757710 Fax:05445757710	Packaging Waste Collection and Separation	12.07.2017
Efe Endüstriyel Girişim Evrensel Temizlik İnşaat Peyzaj Gıda Turizm Kimya Nakliye Sanayi Ve Ticaret Limited Şirketi Safranbolu Şubesi	Bostanbükü Köyü Adalar Mevkii 3 Nolu Bölüm Karabük Tel: 3704132880 Fax:3704130404	Packaging Waste Collection and Separation	28.11.2018
Marzinc Marmara Geri Kazanım Sanayi Ve Ticaret Anonim Şirketi-Karabük Şubesi	Organize Sanayi Bölgesi Akören Mevkii No:4 Karabük Tel:3704476018 Fax:3704476019	Hazardous Waste Recovery	14.01.2019
Orhan Plastik - Fahri Orhan	Cumayanı Küçük San. Site.2.Blok No:11 Karabük Tel:03704422137 Fax:03704422137	Packaging Waste Collection and Separation	05.02.2019