

Chapter 12: Waste Management

Table of Contents

12	Waste Management	12-1
12.1	Introduction.....	12-1
12.2	Applicable Legislation, Standards, and Guidelines.....	12-1
12.2.1	International Legislation	12-2
12.2.2	International Standards and Guidelines.....	12-5
12.2.3	National Waste Management Legislation	12-5
12.2.4	Regional and Local Waste Management Legislation	12-9
12.3	Baseline Conditions and Existing Waste Management Arrangements.....	12-9
12.3.1	Russia	12-10
12.3.2	Bulgaria	12-10
12.3.3	Selection of Waste Contractor	12-11
12.4	Methodology and Assessment Criteria.....	12-11
12.5	Impact Assessment	12-13
12.5.1	Construction and Pre-Commissioning Phase	12-14
12.5.1.1	Waste from Workforce	12-16
12.5.1.2	Waste from Construction Activities.....	12-16
12.5.1.3	Hazardous Waste.....	12-16
12.5.2	Operational Phase	12-17
12.5.3	Decommissioning Phase	12-18
12.6	Design Controls and Mitigation Measures	12-19
12.6.1	General Approach to Waste Management.....	12-19
12.6.2	General Design Controls and Mitigation Measures.....	12-20
12.6.3	Specific Design Controls and Mitigation Measures.....	12-21
12.6.3.1	Waste from Workforce and Construction Activities	12-21
12.6.3.2	Hazardous Waste.....	12-22
12.6.3.3	Summary	12-22
12.6.4	Monitoring	12-27
12.6.5	Assessment of Residual Impact Significance.....	12-27
12.7	Unplanned Events	12-30
12.8	Cumulative Impacts.....	12-31
12.9	Conclusions.....	12-31

Tables

Table 12.1 Summary of International Waste Management Requirements	12-2
Table 12.2 Relevant Requirements for Disposal of Garbage under MARPOL Annex V	12-4
Table 12.3 IFC Guidelines and Performance Standards Relevant to Waste Management	12-6
Table 12.4 Summary of National Waste Management Legislation	12-8
Table 12.5 Magnitude of Waste Impacts	12-12
Table 12.6 Estimated Types and Volumes of Waste during Offshore Construction and Pre-Commissioning Activities	12-14
Table 12.7 Estimated Types and Volumes of Waste during Operational Activities	12-18
Table 12.8 Estimated Types and Volumes of Waste during Decommissioning Activities	12-19
Table 12.9 Typical Contents of an Integrated Waste Management Plan.....	12-20
Table 12.10 Mitigation and Management Measures	12-23
Table 12.11 Assessment of Residual Impact Significance	12-27

12 Waste Management

12.1 Introduction

This chapter presents an assessment of the potential waste impacts arising from the Project. It relates to solid waste, non-aqueous liquid waste, and wastewaters.

It should be noted that no solid waste and no non-aqueous liquid wastes will be disposed of at Turkish facilities. Where appropriate, the assessment below considers the disposal of certain wastes at waste disposal facilities in Russia or Bulgaria.

The methodology used to assess potential waste impacts differs slightly from that detailed in **Chapter 3 Impact Assessment Methodology** due to the unique nature of waste when considered as a Project impact. Unlike many other impact categories, waste is a product of the Project and impacts from waste will depend on the ability of facilities and management systems to store, transport, treat and dispose of waste in a safe and environmentally sound manner. There are a number of applicable legislative requirements and standards that exist, which must be adhered to, and a range of potential waste management practices that can be applied.

The assessment is based on the Project description provided in **Chapter 5 Project Description** and the waste products anticipated to be generated as part of Construction and Pre-Commissioning, Operational, and Decommissioning Phases.

The waste description section (Section 12.5) evaluates the type and volume of wastes anticipated to be generated. Section 12.6 considers the potential impacts of wastes based on the availability and capacity of waste management infrastructure. It is recognised that impacts can arise throughout the waste management supply chain and therefore the generation, storage, collection and transport, reuse, recycling, recovery, treatment and disposal of waste are considered.

Mitigation measures that will be adopted to manage anticipated wastes so as to minimise their environmental impact and ensure compliance with relevant local, national and international regulations are provided. These approaches represent standard Good International Industry Practice (GIIP) for the various waste streams under consideration and make use of existing facilities in Russia and Bulgaria as far as practicable. The assessed significance of the residual impacts for each waste stream takes into account the identified mitigation measures.

The Project Environmental and Social Management Plan (ESMP) (described in **Chapter 16 Environmental and Social Management**) sets out how the mitigation measures detailed within this chapter shall be practically applied to the Construction and Pre-Commissioning and Operational Phases of the Project.

12.2 Applicable Legislation, Standards, and Guidelines

Chapter 2 Policy, Regulatory and Administrative Framework describes the framework of legislation, standards and guidelines relevant to the ESIA process; those of particular relevance to waste management are summarised in Table 12.1.

12.2.1 International Legislation

There are four international conventions associated with waste management that are relevant in the context of this ESIA Report. Table 12.1 highlights the most relevant parts of these conventions in relation to waste management aspects of the Project.

Table 12.1 Summary of International Waste Management Requirements

Name	Relevance
<p>Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention), 1972 (Ref. 12.1)</p> <p>(Turkey is not a Party to the London Convention)</p>	<p>The objective of the London Convention is to control pollution of the sea caused by dumping activities and to encourage supplementary regional agreements. As such, it covers the deliberate disposal at sea of wastes or other matter from vessels, aircraft and platforms. Under these requirements, Parties are to establish authorities responsible for issuing permits, keeping records and monitoring the condition of the seas. Furthermore, Parties are to promote measures, which prevent pollution from hydrocarbons, additional matter transported other than for dumping, wastes generated during operation of ships, etc. and matter originating from exploration of the sea bed. Annexes I and II of the London Convention list matter which is defined as prohibited or restricted with regards to dumping.</p>
<p>Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Basel Convention), 1992 (Ref. 12.2)</p> <p>(Turkey has signed and ratified the Basel Convention)</p>	<p>The Basel Convention regulates transboundary movements of hazardous wastes and provides obligations upon its Parties to ensure that such wastes are managed and disposed of in an environmentally sound manner. The main principles of the Convention are as follows:</p> <ul style="list-style-type: none"> • Transboundary movements of hazardous wastes should be reduced to a minimum, which is consistent with their environmentally sound management; • Hazardous wastes should be treated and disposed of as close as possible to their source of origin; and • Hazardous waste generation should be reduced and minimised at source. <p>Annexes I to VIII of the Basel Convention provide lists of waste categories requiring special consideration or controls, including disposal operations.</p> <p>Annex I outlines a list of waste categories to be controlled, Annex II details waste categories requiring special consideration and Annex III provides a list of important hazardous characteristics.</p>
<p>Convention on Persistent Organic Pollutants (Stockholm Convention), 2001 (Ref. 12.3)</p> <p>(Turkey has signed and ratified the Stockholm Convention)</p>	<p>The Convention seeks to ensure the limitation of pollution by persistent organic pollutants (POPs). It defines the substances in question, whilst leaving open the possibility of adding new ones, and also defines the rules governing the production, importing and exporting of those substances.</p>

Continued...

Name	Relevance
<p>International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78 Convention) Annex I – VI (Ref. 12.4)</p> <p>(Turkey has acceded to all Annexes of the MARPOL Convention)</p>	<p>The Convention covers the prevention of pollution of the marine environment by ships from operational or accidental causes. With regards to waste management, the Convention defines conditions for waste disposal in the marine environment by ship, particularly in determined "special areas" such as the Black Sea (for Annexes I and V). Annex I includes regulations for the Prevention of Pollution by Oil and is mandatory. Annex II includes regulations for the Control of Pollution by Noxious Liquid Substances in Bulk. Annex III includes regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packed Form. Of particular relevance to waste management aspects of the Project are Annex IV and Annex V. Annex IV includes regulations for the Prevention of Pollution by Sewage from Ships. Annex V includes regulations for the Prevention of Pollution by Garbage from Ships. Annex VI includes regulations for the Prevention of Air Pollution from Ships.</p>
<p>Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention), 1992 (Ref. 12.5).</p> <p>(Turkey has signed and ratified the Bucharest Convention)</p>	<p>The Convention provides a basic framework of agreement and three specific Protocols, which are: (1) the control of land-based sources of pollution; (2) control of dumping of waste; and (3) joint action in the case of accidents (such as oil spills). Discharges from ships are managed in accordance with MARPOL and are as such compliant with the Bucharest Convention. The "Protocol on the Protection of the Black Sea Marine Environment Against Pollution by Dumping" does not apply to any of the wastes generated by the Project in the Turkish EEZ since the Project Activities in these waters do not comprise dumping as defined in the Convention.</p>

Complete.

Of these international conventions, the most relevant to this project is the MARPOL Convention, which governs management of waste on board vessels.

Under MARPOL Annex I, within any Special Area, as defined by the Annex, any discharge of oil from a ship exceeding 400 gross registered tonnage (GRT) is prohibited, except when:

- The ship is proceeding en route;
- The oily mixture is processed through oil filtering equipment meeting the relevant MARPOL requirements;
- The oil content of the effluent without dilution does not exceed 15 parts per million;
- The oily mixture does not originate from cargo pump room bilges on oil tankers; and
- The oily mixture, in case of oil tankers, is not mixed with oil cargo residue.

The Black Sea is a Special Area under MARPOL Annex I. This effectively prohibits the discharge of oily sludge and slops, and requires oily bilge water to be treated through an oily water separator (OWS) prior to discharge.

MARPOL Annex IV provides regulations for the prevention of pollution by sewage from ships. MARPOL Annex IV defines "sewage" as:

- Drainage and other wastes from any forms of toilet and urinal;
- Drainage from medical premises (dispensary, sick bay, etc.) via wash basins, wash tubs and scuppers located in such premises;
- Drainage from spaces containing living animals; or
- Other waste waters when mixed with the drainages defined above.

The discharge of sewage into the sea is prohibited, except when:

- The ship is discharging comminuted and disinfected sewage at a distance of more than three nautical miles (NM) from the nearest land, or sewage which is not comminuted or disinfected at a distance of more than 12 NM from the nearest land, provided that in any case, the sewage that has been stored in holding tanks shall not be discharged instantaneously but at a moderate rate when the ship is en route and proceeding at not less than 4 knots; or
- The ship has in operation an approved sewage treatment and (additionally) the effluent shall not produce visible floating solids nor cause discoloration of the surrounding water.

MARPOL Annex V provides regulations for the prevention of pollution by garbage from ships and limits the disposal, be it continuous or periodic, of food, domestic and operational waste into the sea. Annex V completely prohibits the disposal of plastics anywhere into the sea and places strict restrictions upon discharges into designated Special Areas. The Black Sea is a Special Area under Annex V.

Amendments to Annex V entered into force on 1 January 2013, and the revised Annex V prohibits the discharge of all garbage into the sea, except as provided otherwise. An overview of the revised MARPOL Annex V discharge provisions (as relevant to the Project) is presented in Table 12.2.

Table 12.2 Relevant Requirements for Disposal of Garbage under MARPOL Annex V

Type of waste	Ships within Special Areas
Food waste comminuted or ground	Discharge permitted provided vessel is ≥ 12 nautical miles (NM) from the nearest land and <i>en route</i>
Food waste not comminuted or ground	Discharge prohibited
Cargo residues* not contained in wash water	Discharge prohibited
Cargo residues* contained in wash water	Discharge only permitted in specific circumstances† and ≥ 12 NM from the nearest land and <i>en route</i>

Continued...

Type of waste	Ships within Special Areas
Cleaning agents and additives contained in cargo hold wash water	Discharge only permitted in specific circumstances† and ≥12 NM from the nearest land and <i>en route</i>
Cleaning agents and additives contained in deck and external surface wash water	Discharge permitted
All other garbage including plastics, domestic waste, cooking oil, incinerator ashes, operational wastes and fishing gear	Discharge prohibited
Mixed garbage	When garbage is mixed with or contaminated by other substances prohibited from discharging or having different discharge requirements, the more stringent requirements shall apply

* These substances must not be harmful to the marine environment.

† According to regulation 6.1.2 of MARPOL Convention Annex V, the discharge shall only be allowed if: (a) both the port of departure and the next port of destination are within the special area and the ship will not transit outside the special area between these ports (regulation 6.1.2.2); and (b) if no adequate reception facilities are available at those ports (regulation 6.1.2.3).

Complete.

12.2.2 International Standards and Guidelines

In addition to the international legislation outlined above, the Project is aligned with the International Finance Corporation (IFC) Environmental, Health and Safety (EHS) Guidelines and Performance Standards (PS).

Table 12.3 summarises the IFC EHS Guidelines and PS that require consideration in relation to waste management aspects of the Project.

12.2.3 National Waste Management Legislation

Given that only aqueous wastes (waste waters) will be disposed of in the Turkish Exclusive Economic Zone (EEZ) and that no solid or non-aqueous wastes will be landed at Turkish facilities, the main national regulation of relevance is the Regulation on Water Pollution Control (Official Gazette Date: 31 December 2004 and No: 25687). This sets the legal and technical principles to be followed in the control of water pollution, in order to protect ground and surface waters and to prevent water pollution including within the Black Sea in the EEZ, taking into consideration sustainable development objectives. A summary of national waste management legislations is presented in Table 12.4.

Table 12.3 IFC Guidelines and Performance Standards Relevant to Waste Management

Name	Relevance
IFC (2007): General EHS Guidelines: Environmental (Ref. 12.6)	<p>The IFC EHS Guidelines are technical reference documents that provide general and industry-specific examples of Good International Industry Practice (GIIP). The Guidelines cover a wide range of technical subjects, including hazardous and non-hazardous waste management.</p> <p>Section 1.5 Hazardous Waste Management states that:</p> <p><i>"Projects which manufacture, handle, use, or store hazardous materials should establish management programs that are commensurate with the potential risks present. The main objectives of projects involving hazardous materials should be the protection of the workforce and the prevention and control of releases and accidents. These objectives should be addressed by integrating prevention and control measures, management actions, and procedures into day-to-day business activities."</i></p> <p>Section 1.6 Waste Management states that:</p> <ul style="list-style-type: none"> • <i>"Facilities that generate and store wastes should practise the following:</i> • <i>establishing waste management priorities at the outset of activities based on an understanding of potential Environmental, Health, and Safety (EHS) risks and impacts and considering waste generation and its consequences;</i> • <i>establishing a waste management hierarchy that considers prevention, reduction, reuse, recovery, recycling, removal and finally disposal of wastes;</i> • <i>avoiding or minimizing the generation of waste materials, as far as practicable;</i> • <i>where waste generation cannot be avoided but has been minimised, recovering and reusing waste; and</i> • <i>where waste cannot be recovered or reused, treating, destroying, and disposing of it in an environmentally sound manner."</i>
IFC PS3: Resource Efficiency and Pollution Prevention (01 Jan 2012) (Ref. 12.7)	<p>The IFC provides eight PSs that offer guidance regarding the identification of risks and impacts associated with projects, and which aim to reduce, avoid or mitigate these risks and impacts.</p> <p>Of relevance to waste management is PS3: Resource Efficiency and Pollution Prevention. The aim of this standard is to minimise or avoid adverse impacts on human health and the environment, promote sustainable use of resources and reduce greenhouse gas emissions. PS3 states that the client will avoid generation of hazardous and non-hazardous materials, but where waste cannot be avoided, waste arisings will be reduced, recovered or reused before subjecting the materials to treatment and disposal in an environmentally sound manner. Waste disposal should be at sites operating to acceptable standards and, where this is not the case, consideration should be given to alternative disposal options, including the development of facilities on site. The use and production of hazardous waste should be avoided as far as is possible and, where this is not practicable, material will be controlled and minimised.</p>

Continued...

Name	Relevance
IFC PS3 Guidance Note: Resource Efficiency and Pollution Prevention (01 Jan 2012) (Ref. 12.8)	To aid in the interpretation of IFC Performance Standards, Guidance Notes relevant to each standard are also provided. Guidance Note 3 corresponds to PS3 and outlines further details regarding the management of hazardous and non-hazardous wastes. With regard to hazardous waste, Guidance Note 3 lists international conventions the client should refer to when reviewing components of materials and hazardous waste; these conventions are listed in the Bibliography of Guidance Note 3.

Complete.

Table 12.4 Summary of National Waste Management Legislation

Legislation	Date /Reference Number	Relevance to the Project
Regulation on Water Pollution Control	Date 31 Dec 2004 and No. 25687	Sets the legal and technical principles to be followed in the control of water pollution, in order to protect the ground and surface waters and to prevent water pollution, taking into consideration the sustainable development objectives.
Regulation on Control of Waste Oils	Date: 30 July 2008 and No: 26952	Provides standards for storage, transportation and disposal of waste oils and to prevent their discharge into the receiving environment.
Regulation on Waste Collection from Vessels and Control of Wastes	Date: 26 Dec 2004 and No: 25682	Lays down the principles and procedures on waste reception from ships in ports. Defines the requirements related to receiving, storing and transporting of wastes from vessels as well as providing methods and principles concerning the establishment and operation of waste reception facilities in harbours.
Regulation on Declaration According to the Safety of Life At Sea (SOLAS) and MARPOL Conventions	Date: 11 Aug 2006 and No: 26256 (For MARPOL Annexes: Date: 24 Jun 1990 for Annex I, II and V, updated on 16 Mar 2013 and 14 May 2013 to include Annex III, IV and VI)	Sets forth principles and procedures for reporting, communication and notification activities within the scope of SOLAS and MARPOL Conventions.

12.2.4 Regional and Local Waste Management Legislation

There are no regional or local waste management regulations which are relevant to this assessment.

12.3 Baseline Conditions and Existing Waste Management Arrangements

The Strategic Action Plan (SAP) for the Environmental Protection and Rehabilitation of the Black Sea (adopted in Sofia, Bulgaria, 17 April 2009) (Black Sea Commission) (Ref. 12.9) includes a number of provisions related to waste management.

Waste management itself is not one of the priority transboundary problems identified in the SAP, although oil pollution is recognised as an aspect of chemical pollution, which is one of the four priority problems.

The SAP presents Ecosystem Quality Objectives (EcoQOs), which are statements that reflect how stakeholders would like the state of the Black Sea to be over the long term, based on a resolution of priority problems identified in the Transboundary Diagnostic Analysis. Each EcoQO is assigned a number of management targets that address the immediate, underlying and root causes of the concern areas. For regional level interventions, the Black Sea coastal states and the international partners shall work collectively to take the required steps to fulfil those interventions. National level supporting interventions will be the responsibility of individual states.

Several of these management targets relates to waste management:

- Target (18): Amend national waste strategies and/or national coastal zone management plans with the aim of coastal and marine litter minimisation;
- Target (19): Develop regional and national marine litter monitoring and assessment methodologies on the basis of common research approaches, evaluation criteria and reporting requirements;
- Target (20): Promote and/or develop investment projects within national strategies/local plans to engineer, construct and install new solid waste recycling facilities, landfill sites and incineration plants, complying with best available technology regulations;
- Target (60): Provide adequate port reception facilities for ship-generated wastes according to MARPOL 73/78, Annex I, IV, V;
- Target (61): Establish a harmonised fee/cost recovery system on ship-generated waste;
- Target (62): Develop systems for the identification of illegal pollution sources from vessels and off-shore installations; and
- Target (63): Develop and/or establish a harmonised enforcement system in cases of illegal discharges from vessels and off-shore installations, including technical means and fines.

The SAP presents indicators for each target, although a status update has not been published by the Black Sea Commission.

Existing waste management facilities at one or more of Temryuk and Novorossiysk Ports (in Russia) and Varna and Burgas Ports (in Bulgaria) will be used for the management of wastes generated by the Project offshore. No ports or facilities in Turkey will be used for waste disposal or storage.

12.3.1 Russia

Temryuk and Novorossiysk Port have arrangements in place with port waste management companies to provide waste reception facilities for vessels using the port, and these contractors include:

- Marine Consulting LLC;
- Mortrans-Service NHB LLC;
- SPC Crocus LLC; and
- Krymskvtorsyryo LLC.

12.3.2 Bulgaria

Both the Port of Varna and the Port of Burgas maintain facilities for the offloading of oil waste, construction waste, garbage and wastewater from ships. The Port of Varna - Varna East and Varna West, which is expected to receive a proportion of Project waste, is certified to International Organisation for Standardisation (ISO) 14001:2004 and maintains a program for management of port generated waste (including from vessels using the port), effective for the period 2011 to 2016. The Port of Varna maintains facilities for the temporary storage of port generated waste before transport for subsequent treatment, in compliance with the requirements of the Waste Management Act (No. 53/2012).

The Port Infrastructure State Company is responsible for any collection, transportation, storage and treatment of ship generated waste and cargo residues.

Contracts that are in place for waste management at the Port of Varna (transport and disposal) include:

- Marine Antipollution Enterprise (MAE), South Industrial Zone, Varna (licensed collection contractor for MAPROL Annex I and V waste at port of Varna);
- Transins Reciclig Company of Varna Ltd;
- Titan AS Ltd;
- Eco Varna PLC;
- Metarex Ltd; and
- Transins Battery Ltd.

The port services for reception and treatment of waste at the Port of Burgas are also performed by MAE (head office in Varna, South Industrial Area). Bilge and sludge are collected by PCMV, a company which collects oily waste from vessels, on demand by ship agents.

Contracts that are in place for waste management at the Port of Burgas are as follows:

- Titan Burgas;
- Ocean Shipping; and
- Specta auto.

The Port of Burgas has mobile facilities for the storage of vessel waste; it also has facilities for storage and treatment of bilge and sludge. The Port of Burgas has no licensed volume limits or waste type restrictions.

12.3.3 Selection of Waste Contractor

The contractor managing the vessels used for the Project will arrange with one or more of these port waste management companies to receive vessel waste, depending on which port is used, and the port waste management company will be responsible for the onwards transportation and management of the vessel waste, using the existing regional disposal and treatment facilities. Further inspection of the waste management facilities will be undertaken prior to completion of waste management contracts, i.e. to confirm that sufficient capacities are available to manage Project wastes legally and safely, in accordance with the requirements set out in Section 12.6 and the suite of Construction and Operations Management Plans (refer to **Chapter 16 Environmental and Social Management**).

12.4 Methodology and Assessment Criteria

In contrast to the other environmental and social technical disciplines assessed within this ESIA Report, the assessment of impacts describes the estimated wastes arising, but does not assess the magnitude of these impacts pre- and post-mitigation since waste storage, management and disposal is considered part of the Project design, and as such it is not realistic to consider any situation in which no mitigation would be carried out. The mitigation section therefore describes the measures that will be adopted to manage the wastes generated by the Project (including identifying potentially suitable facilities), and the significance of residual impacts following mitigation is then assessed.

Impact magnitudes for the residual impacts following mitigation are assessed based on:

- The hazardous properties (physical, chemical and biological) of the relevant waste stream; and
- The availability of suitable waste management facilities, taking into consideration:
 - The volume of waste produced;

- The capacity of the identified waste management facilities for managing the waste in compliance with relevant guidelines¹; and
- The degree of certainty in the availability of these facilities.

Table 12.5 presents a matrix that compares waste type and the availability of suitable waste management facilities, to determine impact magnitude (negligible, low, moderate, and high).

Table 12.5 Magnitude of Waste Impacts

Waste Management Option	Type of Waste		
	Inert	Non-hazardous	Hazardous
Suitable facilities or outlets available with sufficient capacity to manage the quantities of wastes generated	Negligible	Negligible	Low
Suitable facilities or outlets available but capacity to accept waste from project may be constrained due to size of facility or distance from site	Low	Moderate	Moderate
Facilities are unavailable or unsuitable; or means of management is uncertain	Moderate	Moderate	High

Since receptor sensitivity was assumed to be constant, the rankings (negligible, low, moderate, and high) delivered by the impact magnitude matrix in Table 12.5 also reflect “impact significance”; the definitions of significance detailed in **Chapter 3 Impact Assessment Methodology** are therefore applicable.

The definition of hazardous waste includes any wastes specifically designated as hazardous within applicable legislative requirements. For the purposes of this ESIA Report, hazardous wastes are also defined in terms of the IFC General EHS Guidelines for Waste Management, i.e. wastes that share the properties of a hazardous material (e.g. ignitability, corrosivity, reactivity, or toxicity), or other physical, chemical, or biological characteristics that may pose a potential risk to human health or the environment if improperly managed.

Inert waste is recognised in IFC guidelines and is defined in the European Union (EU) Landfill Directive such that *"waste is considered inert if:*

- 1. It does not undergo any significant physical, chemical or biological transformations;*

¹ The capacity of facilities has been qualitatively assessed by comparing the size and scale of the potential facilities with the estimated quantities of wastes arising from the Project; and using professional judgement to determine whether the facility is likely have sufficient capacity to accommodate the project’s wastes.

2. *It does not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm to human health; and*
3. *Its total leachability and pollutant content and the ecotoxicity of its leachate are insignificant and, in particular, do not endanger the quality of any surface water or groundwater."*

In practice, inert waste typically comprises surplus excavated soil and rock, and waste construction materials such as brick and concrete.

Suitable facilities are those which are licensed by the relevant regulatory authorities and (in the case of hazardous waste sites) are operating in accordance with GIIP². The suitability of facilities has been assessed for the purposes of the ESIA Report by site visits and review of available information, and the operational capabilities and licensing status of the facilities actually used will be confirmed.

No specific waste study area was defined for the purpose of this chapter. Rather, the assessment considered waste arising within the established Project Area boundaries and associated activities defined in **Chapter 1 Introduction**.

12.5 Impact Assessment

The Project has the potential to give rise to a number of wastes during the Construction and Pre-Commissioning, Operational and Decommissioning Phases.

The potential impacts arising from the management of wastes include:

- Impacts on ecological receptors from releases of waste to air, water or land; and
- Nuisance, including litter, odour, dust and vermin.

The impacts of wastes associated with the Decommissioning Phase of the Project have not been assessed in detail as the available waste facilities and disposal technologies are likely to change significantly over the 50 year life of the Project. For the Decommissioning Phase, the assessment is limited to identifying the types and approximate quantity of waste generated.

Generally, Project wastes can be categorised in terms of their basic properties:

- Non-hazardous waste – e.g. scrap metal, waste paper, card and wood, glass, food waste, packaging waste and other general wastes; and
- Hazardous waste – e.g. oils, certain types of healthcare waste, batteries and other waste exhibiting hazardous properties.

The main types of waste expected to arise from the Construction and Pre-commissioning Phase and Operational Phase of the Project are described in the following sections, with wastes

² In these cases, it is assumed that residual impacts due to releases from these facilities are addressed as part of the facilities pre-existing licensing regime and are therefore not assessed within this ESIA Report.

classified according to the European Waste Catalogue (EWC) classification scheme. The waste characterisation has also been conducted based on the Turkish Regulation on General Principles of Waste Management (Official Gazette Date: 05 July 2008 and No: 26927) which is identical to the EWC.

12.5.1 Construction and Pre-Commissioning Phase

The main activities which have the potential to generate waste in the Turkish Sector during the Construction and Pre-commissioning Phase are:

- Activities of pipe-lay vessels and regular deliveries of construction materials;
- Activities of other vessels and support craft;
- Assembly (mounting, joining, pulling) of the pipelines; and
- Activities of the crew involved in the operation of Project vessels and workers associated with the maintenance of the vessels.

Types and quantities of waste likely to be produced have been calculated and are summarised in Table 12.6. Further details are provided in the following paragraphs.

Table 12.6 Estimated Types and Volumes of Waste during Offshore Construction and Pre-Commissioning Activities

EWC Code	EWC Description	Source	Estimated Quantity (for all four pipelines) (tonnes)
12 01 01	Ferrous metal filings and turnings	Scrap from preparing pipes for welding	100 to 1000
12 01 05	Plastics shavings and turnings	Scrap from preparing pipes for welding by abrasion of polypropylene coating	10 to 100
12 01 13	Welding wastes	Waste from pipe welding	10 to 100
13 01 10*	Mineral based non-chlorinated hydraulic oils	MARPOL Annex I waste from vessels	1 to 10
13 02 05*	Mineral-based non-chlorinated engine, gear and lubricating oils	MARPOL Annex I waste from vessels	1 to 100
13 04 03*	Bilge oils from other navigation	MARPOL Annex I waste from vessels	10 to 100

Continued...

EWC Code	EWC Description	Source	Estimated Quantity (for all four pipelines) (tonnes)
13 07 01*	Fuel oil and diesel wastes (sludges)	MARPOL Annex I waste from vessels	1000 to 2000
15 01 01	Paper and cardboard packaging	Waste paper/card packaging from construction materials and crew facilities	1 to 10
15 01 02	Plastic packaging	Waste plastic packaging from construction materials and crew facilities	1 to 10
15 01 03	Wooden packaging	Waste wooden packaging from construction materials	10 to 100
15 01 04	Metallic packaging	Waste metal drums (clean) and drinks cans	1 to 10
15 01 07	Glass packaging	Waste glass from construction materials and crew facilities	1 to 10
15 01 10*	Packaging containing residues of or contaminated by dangerous substances	Waste metal drums containing solvent/oil residues	Less than 1
15 02 02*	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	Oily rags	Less than 1
17 02 03	Plastic	Waste plastic from joint protection sleeves	Less than 1
17 09 04	Mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	General mixed construction waste from offshore works	100 to 1000
18 01 03*	Wastes whose collection and disposal is subject to special requirements in order to prevent infection	Potentially infectious waste from clinics	Less than 1

Continued...

EWC Code	EWC Description	Source	Estimated Quantity (for all four pipelines) (tonnes)
20 01 08	Biodegradable kitchen and canteen waste	Source-separated waste canteen waste	100 to 1000
20 01 21*	Fluorescent tubes and other mercury-containing waste	Source-separated waste fluorescent tubes	Less than 1
20 03 01	Mixed municipal waste	Mixed garbage from crew accommodation	100 to 1000
n/a	n/a	Sewage ("black water") from construction vessels	14.4 m ³ per day

* hazardous wastes

Complete.

12.5.1.1 Waste from Workforce

Municipal waste will be generated by construction workers and crew of all vessels and is categorised as 'garbage' under MARPOL Annex V. This type of waste will include general mixed waste, food waste and recyclable waste.

The quantities of MARPOL Annex V waste are estimated based on an assumed generation rate of 1.5 kilograms per day. The total number of crew days is estimated as 623,000. This results in overall waste arising of 934 tonnes. Some of this will be biodegradable food waste, some will be general garbage and others will be potentially recyclable.

The workforce and crew aboard vessels will also generate sewage, which is regulated under MARPOL Annex IV.

12.5.1.2 Waste from Construction Activities

Pipeline assembling activities will generate wastes associated with the jointing and installation of pipeline sections including stubs of welding electrodes, spent polishing bodies and metal swarf.

The construction materials and equipment used may require the disposal of associated packaging elements, typically a mixture of paper and cardboard, wood and plastic waste. Due to the scale of equipment used in the pipe-laying, some packaging waste items may be relatively large in dimension.

12.5.1.3 Hazardous Waste

A number of hazardous wastes may potentially be generated as a result of the offshore construction and pre-commissioning works, including:

- Waste oils and batteries from maintenance of construction plant;

- Oily waste generated during normal operation of the vessels undertaking the works (e.g. oily sludges and bilge oil);
- Waste fluorescent tubes and other lamps containing mercury from construction vessels;
- Packaging with residues of hazardous substances; and
- Clinical wastes, which may be generated from medical facilities on board the vessels.

Oily wastes will be generated by vessels as a result of fuel filtering, collection of oily slops from machinery spaces, and from oily bilge water. Oily wastes generated by vessels are controlled under MARPOL Annex I. The discharge of any oily sludge or slops is prohibited. Bilge water may be discharged following treatment by an OWS system, provided such discharge is in compliance with the requirements of MARPOL Annex I. In practice, the requirement under MARPOL Annex I for vessels to be "proceeding en route" when they discharge treated bilge water may preclude pipe lay vessels from treating and discharging any bilge water, since they will be almost stationary whilst pipe laying. The oily residue following treatment of bilge water through an OWS will be managed in the same way as oily sludge or slops.

Oily sludge generation on board vessels is assumed to be 0.5% of fuel consumption. Vessel fuel consumption during construction and pre-commissioning is estimated as 200,000 tonnes giving sludge generation of approximately 1,000 tonnes. Unknown quantities of oily bilge water will also be generated, and will depend on the operational conditions of the vessels, in particular whether they have oily water separation systems and/or bilge water holding tanks. Other waste types have been estimated based on the vessel number and type used in pipeline construction vessel spread.

12.5.2 Operational Phase

In comparison to the Construction and Pre-Commissioning Phase, it is anticipated that the Operational Phase of the Project will generate much smaller quantities of waste.

Types and quantities of waste likely to be produced have been calculated and are presented in Table 12.7.

Normal operation of the pipelines will not generate waste in the Turkish Sector. Surveys will be carried out of critical areas on an annual basis using Remotely Operated Vehicles (ROV), and of the whole Pipeline every five years. These surveys will be carried out from vessels and the survey duration is expected to be five days for annual surveys and up to 30 days for the five year surveys. The survey vessels will generate relatively small quantities of waste classified under MARPOL Annex V (garbage) and MARPOL Annex I (oily waste): it is assumed that there will be no significant construction work during normal operation.

In the event of emergency pipeline repair, vessels will need to be mobilised and welding may be required. The types of waste would be similar to those generated during construction, but since the frequency and severity of pipeline repair cannot be estimated, there is no information on the quantities of waste arising. Since the probability of failure is expected to be low, the likelihood of significant quantities of repair waste being generated is also expected to be low.

Table 12.7 Estimated Types and Volumes of Waste during Operational Activities

EWC Code	EWC Description	Source	Estimated Quantity (for all four pipelines)
13 01 10*	mineral based non-chlorinated hydraulic oils	MARPOL Annex I waste from vessels	Less than 1 tonne per annum (average)
13 02 05*	mineral-based non-chlorinated engine, gear and lubricating oils	MARPOL Annex I waste from vessels	Less than 1 tonne per annum (average)
13 04 03*	bilge oils from other navigation	MARPOL Annex I waste from vessels	1 to 10 tonnes per annum (average)
13 07 01*	fuel oil and diesel wastes (sludges)	MARPOL Annex I waste from vessels	1 to 10 tonnes per annum (average)
20 01 08	biodegradable kitchen and canteen waste	Canteen waste from crew facilities	Less than 1 tonne per annum (average)
20 03 01	mixed municipal waste	Canteen waste from crew facilities	Less than 1 tonne per annum (average)

* hazardous wastes

12.5.3 Decommissioning Phase

The expected service lifetime of the South Stream Offshore Pipeline is 50 years. Decommissioning of the pipeline will be undertaken in accordance with the legislation prevailing at that time, in liaison with the relevant regulatory authorities.

Within this timeframe there may be changes to statutory decommissioning requirements, as well as advances in technology and knowledge. South Stream Transport will therefore utilise GIIP during all decommissioning operations.

The actual method used for decommissioning will not be determined until closer to the time of decommissioning, and in particular no decision has been made on whether the subsea pipelines will be removed, or whether they will be decommissioned in situ (i.e. flushed, filled with water, sealed and left in position).

If during decommissioning the pipelines are removed, the main waste materials generated by decommissioning will be metal (from pipes and ancillary equipment). Depending on the techniques used, small quantities of waste associated with maintenance of the plant used for decommissioning may also be generated. An estimate of potential waste arising during decommissioning is given in Table 12.8.

Table 12.8 Estimated Types and Volumes of Waste during Decommissioning Activities

EWC Code	EWC Description	Source	Estimated Quantity (for all four pipelines) (tonnes)
17 04 05	Iron and steel	Removal of pipelines and associated equipment	1.4 million tonnes
13 01 10*	Mineral based non-chlorinated hydraulic oils	MARPOL Annex I waste from vessels	1 to 100 tonnes
13 02 05*	Mineral-based non-chlorinated engine, gear and lubricating oils	MARPOL Annex I waste from vessels	1 to 100 tonnes
13 04 03*	Bilge oils from other navigation	MARPOL Annex I waste from vessels	1 to 100 tonnes
13 07 01*	Fuel oil and diesel	MARPOL Annex I waste from vessels	1 to 100 tonnes
20 01 08	Biodegradable kitchen and canteen waste	Canteen waste from crew facilities	1 to 100 tonnes
20 03 01	Mixed municipal waste	Canteen waste from crew facilities	1 to 100 tonnes

* hazardous wastes

12.6 Design Controls and Mitigation Measures

12.6.1 General Approach to Waste Management

The general approach to managing solid waste will be described in the Integrated Waste Management Plan (WMP) drawn up by contractors. This will provide guidance on:

- Waste minimisation and prevention;
- Identification and segregation of waste materials at source;
- Recycling and reuse of suitable materials; and
- Treatment and disposal of specific waste streams.

The Integrated WMP will refer to vessel-specific WMPs which will include provisions for segregating waste on board, having secure areas for storage of hazardous waste and recycling / reuse where practicable.

The structure of the Integrated WMP should follow the outline provided in Table 12.9.

Table 12.9 Typical Contents of an Integrated Waste Management Plan

Section	Content
Introduction	Background
	Plan Objectives
	Limitations of the WMP
	Layout of the WMP
Project Description	Project Details
	Nature of Project
	Location
Management Arrangements	Roles and Responsibilities
	WMP Distribution
	Instruction and Training
	Performance Indicators
Waste Management Arrangements	Forecast Waste Arisings
	Record of Decisions Taken Regarding Waste Management
	Opportunities for Increasing Recycled Content
	Opportunities for Waste Minimisation
	Waste Storage and Segregation Arrangements
	Waste Management Arrangements
Monitoring Arrangements	

All wastes will be managed in accordance with the applicable regulations and statutory obligations.

12.6.2 General Design Controls and Mitigation Measures

The general approach to mitigating impacts will be to use licensed facilities which comply with national regulations (whether Bulgarian or Russian, as appropriate) and the requirements of the IFC EHS Guidelines and Performance Standards. Prior to the start of construction works, contracts will be arranged with licensed organisations for the transport, reuse, recycling,

treatment and final disposal of waste. No waste generated by construction of the Project will be transported and disposed of onshore in Turkey. However, it should be noted that no decision as to which potential waste facility sites in Russia and Bulgaria will be used has been taken at this time and will be subject to further investigation.

12.6.3 Specific Design Controls and Mitigation Measures

The specific mitigation measures that will be adopted to ensure responsible management of the wastes arising from the Project are described below and summarised in Table 12.10.

12.6.3.1 Waste from Workforce and Construction Activities

Offshore waste during both construction and operation will be managed in accordance with the requirements of MARPOL 73/78.

With respect to MARPOL Annex V waste, there will be no discharge of any garbage within 12 nautical miles of the coast. Outside this 12 NM limit, food waste may be comminuted or ground prior to discharge, providing vessels are en route. MARPOL Annex V does not give any minimum speed as part of the definition of "en route".

Garbage will be stored on vessels in suitable containers, clearly marked to indicate the type of waste within. Any garbage requiring transfer, either to support vessels or for onshore disposal, will be located in order to provide ease of access for loading and unloading. Once the waste has been transferred to shore, it will be collected by the port authorities or their nominated contractors using the existing port waste reception facilities.

Alternatively, if equipped, vessels may make use of on-board garbage incineration units, provided these are the type approved in accordance with the International Maritime Organisation (IMO) "Standard Specification for Shipboard Incinerators" and comply with the requirements of Regulation 16 of MARPOL Annex VI and the Standard Specification for On-board Ship Incinerators, adopted by the Marine Environment Protection Committee on 25 September 1997 (Ref. 12.4). On vessels capable of incineration the following solid wastes may be incinerated: domestic waste (excluding glass); operating wastes (e.g. oily sludges); textiles; and uncontaminated plastic containers. Solid wastes that will not be incinerated include mercury vapour lamps and mercury-containing fluorescent tubes, glass and scrap metal.

There will be no inappropriate mixing of waste types (e.g. domestic waste with hazardous waste) and containers will be not overfilled. Where feasible, recyclable garbage (e.g. glass and plastics) will be separated at source, separately stored and collected for recycling by the port waste reception contractors.

Where waste is transferred to other ships, specific procedures will govern methods employed for preparing material and ensuring accidental discharge, spillages or leaks do not occur. Consignment notes detailing the quantity and type of waste transferred between ships will be kept.

Project vessels will carry a Garbage Management Plan, which will include written procedures for collection, storage, processing and disposal of waste, including the use of any relevant equipment fitted onboard. The Garbage Management Plan will designate the persons

responsible for carrying out the Plan. Vessels over 400 gross tonnage or carrying more than 15 passengers shall also maintain a Garbage Book.

For the purposes of complying with MARPOL 73/78, construction waste arising on board the vessels will be managed as MARPOL Annex V waste, with discharge at sea strictly prohibited. All waste (predominantly welding and packaging waste) will be retained on board, source-separated where practicable, and collected by the port authorities or their nominated contractors using the existing port waste reception facilities. Any hazardous waste generated during offshore construction (other than MARPOL Annex I Oily Waste, described separately below) will be stored, collected and managed separately in accordance with Turkish regulations.

Sewage from vessels will be managed in accordance with MARPOL Annex IV. Discharge of sewage will only take place when:

- The ship is discharging comminuted and disinfected sewage at a distance of more than three NM from the nearest land, or sewage which is not comminuted or disinfected at a distance of more than 12 NM from the nearest land, provided that in any case, the sewage that has been stored in holding tanks shall not be discharged instantaneously but at a moderate rate when the ship is en route and proceeding at not less than 4 knots; or
- The ship has in operation an approved sewage treatment and the effluent does not produce visible floating solids nor cause discoloration of the surrounding water.

12.6.3.2 Hazardous Waste

Under MARPOL Annex I, vessels are permitted to discharge bilge water which has been treated using an OWS such that it has oil content below 15 parts per million (ppm), provided the vessel is proceeding en route. "En route" for the purposes of MARPOL Annex I is defined as meaning *"... that the ship is underway at sea on a course or courses, including deviation from the shortest direct route, which as far as practicable for navigation purposes, will cause any discharge to be spread over as great an area of the sea as is reasonable and practicable"*. Vessels which are stationary (i.e. not en route) will be required to retain bilge water on board for subsequent discharge to dedicated collection vessels; or treatment and discharge once they are proceeding en route; or discharge to port waste reception facilities.

Oily sludge will be collected and stored in dedicated sludge tanks. Oily sludge (and residues from bilge water OWS systems) will be treated by incineration in the case of those vessels having MARPOL compliant incinerators. In all other cases, oily wastes will be retained on board for subsequent discharge to dedicated collection vessels or port waste reception facilities.

Vessels will maintain an Oil Record Book and Oil Pollution Emergency Plan in accordance with MARPOL Annex I.

12.6.3.3 Summary

Table 12.10 summarises the management measures proposed for the various waste types anticipated to be generated by the Project and outlines the facilities which may be used for the intermediate storage, treatment and/or disposal of the wastes.

Table 12.10 Mitigation and Management Measures

Description of Waste Type	EWC code	Potential Management Route	Potential Facilities
<i>Construction and Pre-Commissioning Phase</i>			
Scrap from preparing pipes for welding	12 01 01	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Novorosmetall LLC or Krymskvtorsyryo LLC (Russia); MAE Varna (Bulgaria)
Scrap from preparing pipes for welding by abrasion of polypropylene coating	12 01 05	Incinerated on-board or transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
Waste from pipe welding	12 01 13	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
MARPOL Annex I waste from vessels	13 01 10*	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Mortrans-Service NHB LLC or SPC Crocus LLC (Russia); MAE Varna (Bulgaria)
Maintenance of mobile plant and MARPOL Annex I waste from vessels	13 02 05*	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Mortrans-Service NHB LLC or SPC Crocus LLC (Russia); MAE Varna (Bulgaria)
MARPOL Annex I waste from vessels	13 04 03*	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Mortrans-Service NHB LLC or SPC Crocus LLC (Russia); MAE Varna (Bulgaria)
MARPOL Annex I waste from vessels	13 07 01*	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Mortrans-Service NHB LLC or SPC Crocus LLC (Russia); MAE Varna (Bulgaria)
Waste paper and card packaging from construction materials and office and mess facilities	15 01 01	Incinerated on-board or transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)

Continued...

Description of Waste Type	EWC code	Potential Management Route	Potential Facilities
Waste plastic packaging from construction materials and office/mess facilities	15 01 02	Incinerated on-board or transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
Waste wooden packaging from construction materials	15 01 03	Incinerated on-board or transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
Waste metal drums (clean) and drinks cans	15 01 04	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
Waste glass from construction materials and office/mess facilities	15 01 07	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
Waste metal drums containing solvent/oil residues	15 01 10*	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
Oily rags	15 02 02*	Incinerated on-board or transferred to vessel waste reception facilities for disposal at suitable waste facility	Mortrans-Service NHB LLC or SPC Crocus LLC (Russia); MAE Varna (Bulgaria)
Empty gas bottles/canisters	16 05 05	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
Waste plastic from joint protection sleeves	17 02 03	Incinerated on-board or transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)

Continued...

Description of Waste Type	EWC code	Potential Management Route	Potential Facilities
General mixed construction waste	17 09 04	Incinerated on-board or transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
Potentially infectious waste from clinics	18 01 03*	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Mercury Safety Agency LLC (Russia); MAE Varna (Bulgaria)
Source-separated waste canteen waste (from welfare facilities/mess/offices) and MARPOL Annex V waste	20 01 08	Incinerated on-board or transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
Source-separated waste fluorescent tubes (from welfare facilities/mess/offices)	20 01 21*	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Mercury Safety Agency LLC (Russia); MAE Varna (Bulgaria)
Mixed waste (from welfare facilities/mess/offices) and MARPOL Annex V waste	20 03 01	Incinerated on-board or transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
Sewage (black water) from vessels	n/a	Treated and discharged in accordance with MARPOL Annex IV and Turkish regulations	n/a
Bilge water	n/a	Treated and discharged in accordance with MARPOL Annex I and Turkish regulations	n/a
<i>Operational Phase</i>			
MARPOL Annex I waste from vessels	13 01 10*	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)

Continued...

Description of Waste Type	EWC code	Potential Management Route	Potential Facilities
MARPOL Annex I waste from vessels	13 02 05*	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
MARPOL Annex I waste from vessels	13 04 03*	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
MARPOL Annex I waste from vessels	13 07 01*	Transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
Canteen waste from crew facilities	20 01 08	Incinerated on-board or transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
Canteen waste from crew facilities	20 03 01	Incinerated on-board or transferred to vessel waste reception facilities for disposal at suitable waste facility	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)
Sewage (black water) from vessels	n/a	Treated and discharged in accordance with MARPOL Annex IV and Turkish regulations	n/a
Bilge water	n/a	Treated and discharged in accordance with MARPOL Annex I and Turkish regulations	n/a

* Hazardous waste

Complete.

If during decommissioning the pipelines are removed, due to the long period of time before decommissioning is programmed to start, it is not possible to identify specific management routes and facilities for decommissioning waste. However, the great majority of decommissioning waste will be metal.

12.6.4 Monitoring

South Stream Transport will develop a detailed overarching Environmental and Social Monitoring Programme that will detail the monitoring requirements for the Project. As part of this Monitoring Programme, the quantities of waste generated by the overall South Stream Offshore Pipeline and the means of management of these wastes will be monitored on a regular basis. Monitoring will also be carried out to ensure compliance with Turkish regulations and MARPOL requirements for maintenance of Oil and Garbage Record Books as required under MARPOL Annex I and V respectively.

Monitoring records will be maintained which will include, as a minimum, the following information:

- Types and quantities of waste generated;
- Types and quantities of waste leaving Project sites or vessels for recycling, recovery or disposal;
- Details of vehicles or vessels transporting waste;
- Location of treatment or disposal facilities to which the waste is transported; and
- Records of any spillages or unplanned releases, or any enforcement actions.

12.6.5 Assessment of Residual Impact Significance

Table 12.11 indicates the assessed residual impact significance of each waste stream assuming management measures as described are implemented.

Table 12.11 Assessment of Residual Impact Significance

Description of Waste Type	Potential Facilities	Waste Category	Facility Assessment	Residual Impact
<i>Construction and Pre-Commissioning Phase</i>				
Scrap from preparing pipes for welding	Novorosmetall LLC or Krymskvtorsyryo LLC (Russia); MAE Varna (Bulgaria)	Inert	Suitable facilities with sufficient capacity	Negligible
Scrap from preparing pipes for welding by abrasion of polypropylene coating	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Non-hazardous	Suitable facilities with sufficient capacity	Negligible

Continued...

Description of Waste Type	Potential Facilities	Waste Category	Facility Assessment	Residual Impact
Waste from pipe welding	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Non-hazardous	Suitable facilities with sufficient capacity	Negligible
MARPOL Annex I waste from vessels	Mortrans-Service NHB LLC or SPC Crocus LLC (Russia); MAE Varna (Bulgaria)	Hazardous	Suitable facilities with sufficient capacity	Low
Maintenance of mobile plant and MARPOL Annex I waste from vessels	Mortrans-Service NHB LLC or SPC Crocus LLC (Russia); MAE Varna (Bulgaria)	Hazardous	Suitable facilities with sufficient capacity	Low
Waste paper and card packaging from construction materials and office and mess facilities	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Non-hazardous	Suitable facilities with sufficient capacity	Negligible
Waste plastic packaging from construction materials and office and mess facilities	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Non-hazardous	Suitable facilities with sufficient capacity	Negligible
Waste wooden packaging from construction materials	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Non-hazardous	Suitable facilities with sufficient capacity	Negligible
Waste metal drums (clean) and drinks cans	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Inert	Suitable facilities with sufficient capacity	Negligible
Waste glass from construction materials and office and mess facilities	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Inert	Suitable facilities with sufficient capacity	Negligible
Waste metal drums containing solvent/oil residues	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Hazardous	Suitable facilities with sufficient capacity	Low

Continued...

Description of Waste Type	Potential Facilities	Waste Category	Facility Assessment	Residual Impact
Oily rags	Mortrans-Service NHB LLC or SPC Crocus LLC (Russia); MAE Varna (Bulgaria)	Hazardous	Suitable facilities with sufficient capacity	Low
Empty gas bottles and canisters	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Non-hazardous	Suitable facilities with sufficient capacity	Negligible
Waste plastic from joint protection sleeves	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Non-hazardous	Suitable facilities with sufficient capacity	Negligible
General mixed construction waste	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Non-hazardous	Suitable facilities with sufficient capacity	Negligible
Potentially infectious waste from clinics	Mercury Safety Agency LLC (Russia); MAE Varna (Bulgaria)	Hazardous	Suitable facilities with sufficient capacity	Low
Source-separated waste canteen waste (from welfare facilities/mess/offices) and MARPOL Annex V waste	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Non-hazardous	Suitable facilities with sufficient capacity	Negligible
Source-separated waste fluorescent tubes (from welfare facilities/mess/offices)	Mercury Safety Agency LLC (Russia); MAE Varna (Bulgaria)	Hazardous	Suitable facilities with sufficient capacity	Low
Mixed waste (from welfare facilities/mess/offices) and MARPOL Annex V waste	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Non-hazardous	Suitable facilities with sufficient capacity	Negligible
Sewage (black water) from vessels	n/a	Non-hazardous	n/a	n/a

Continued...

Description of Waste Type	Potential Facilities	Waste Category	Facility Assessment	Residual Impact
Bilge water	n/a	Non-hazardous	n/a	n/a
<i>Operational Phase</i>				
MARPOL Annex I waste from vessels	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Hazardous	Suitable facilities with sufficient capacity	Low
Canteen waste from crew facilities	Marine Consulting LLC or Mortrans-Service NHB LLC (Russia); MAE Varna (Bulgaria)	Non-hazardous	Suitable facilities with sufficient capacity	Negligible
Sewage (black water) from vessels	n/a	Non-hazardous	n/a	n/a
Bilge water	n/a	Non-hazardous	n/a	n/a

Complete.

Temryuk and Novorossiysk Port (in Russia) and Varna and Burgas Ports (in Bulgaria) each have established port waste management contractors who have the facilities to accept and manage the wastes likely to be generated from vessels operating in the Turkish EEZ.

The overall quantities of waste requiring management are relatively small in comparison with the capacity of the receiving facilities. Any impacts from accidental release during temporary storage or transport of hazardous wastes will be minimised by implementing vessel specific WMP.

12.7 Unplanned Events

Procedures for dealing with unplanned events will be set out in the Project Emergency Preparedness and Response Plan (EPRP). The mitigation measures described in this section (including the procedures for temporary storage and transportation of waste) have been developed with the intention of mitigating the likelihood of any unplanned release of wastes; for example, releases due to inadequate storage arrangements at the site, or spillages during loading and unloading of wastes, and the Project EPRP will include contingency arrangements in the unlikely event of releases (e.g. provision of spill kits). More general information is contained within **Chapter 13 Unplanned Events**.

12.8 Cumulative Impacts

Given that there are no significant residual impacts relating to waste and the quantities of waste to be produced by the Project are well within the management capacity of the identified facilities, it is not expected that there will be any cumulative impacts associated with managing waste from the Project and the other identified projects, even if it assumed that all projects happen simultaneously. Waste impacts are briefly discussed in **Chapter 14 Cumulative Impact Assessment**.

12.9 Conclusions

The assessment of waste management impacts arising from the Project has identified the waste streams that are anticipated to be produced during the Construction and Pre-Commissioning Phase, Operational Phase and Decommissioning Phase and identified the availability and suitability of existing waste management facilities to manage those wastes. Mitigation measures have been recommended in order to minimise the impacts as far as possible, including the preparation and implementation of an Integrated WMP by contractors. Provided that all of the mitigation measures described above are correctly implemented, the overall waste management impacts from the development are not expected to be significant.

References

Number	Reference
Ref. 12.1	Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention), 1972. http://www.imo.org/OurWork/Environment/SpecialProgrammesAndInitiatives/Pages/London-Convention-and-Protocol.aspx . Accessed April 2014.
Ref. 12.2	Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Basel Convention), 1992. http://www.basel.int/Home/tabid/2202/mctl/ViewDetails/EventModID/8295/EventID/443/xmid/8052/Default.aspx . Accessed April 2014.
Ref. 12.3	Convention on Persistent Organic Pollutants (Stockholm Convention), 2001. http://chm.pops.int/Home/tabid/2121/mctl/ViewDetails/EventModID/1126/EventID/468/xmid/6921/Default.aspx . Accessed April 2014.
Ref. 12.4	International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78 Convention) Annex I – VI. http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx . Accessed April 2014.
Ref. 12.5	The Convention on the Protection of the Black Sea Against Pollution (Bucharest convention), 1992. http://www.blacksea-commission.org/_convention.asp . Accessed April 2014
Ref. 12.6	IFC Environmental, Health, and Safety (EHS) Guidelines - General EHS Guidelines, 2007. http://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/IFC+Sustainability/Sustainability+Framework/Environmental,+Health,+and+Safety+Guidelines/EHS+Guidelines+Technical+Revision/ . Accessed April 2014.
Ref. 12.7	IFC PS3: Resource Efficiency and Pollution Prevention, 2012. http://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/IFC+Sustainability/Sustainability+Framework/Sustainability+Framework+-+2012/Performance+Standards+and+Guidance+Notes+2012/ . Accessed April 2014
Ref. 12.8	IFC PS3 Guidance Note: Resource Efficiency and Pollution Prevention, 2012. http://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/IFC+Sustainability/Sustainability+Framework/Sustainability+Framework+-+2012/Performance+Standards+and+Guidance+Notes+2012/ . Accessed April 2014.
Ref. 12.9	Strategic Action Plan for the Environmental Protection and Rehabilitation of the Black Sea (2009). Accessed from http://www.blacksea-commission.org/_bssap2009.asp . Accessed on 14 March 2013.