8 WASTE MANAGEMENT ASSESSMENT

8.1 Introduction

This *Section* identifies the potential waste arisings from the construction and operation of the Project and the potential environmental impacts associated with the storage, handling, transportation and disposal of the wastes. The assessment was undertaken in accordance with the criteria set out in *Annexes 7* and *15* of the *EIAO-TM*.

8.2 Legislation Requirements and Evaluation Criteria

The following legislation covers the handling, treatment and disposal of wastes in Hong Kong, and has been considered in the assessment.

- *Waste Disposal Ordinance (WDO) (Cap 354);*
- *Waste Disposal (Chemical Waste) (General) Regulation (Cap 354C);*
- *Land (Miscellaneous Provisions) Ordinance (Cap 28);*
- *Public Health and Municipal Services Ordinance (Cap 132) - Public Cleansing and Prevention of Nuisances Regulation*; and
- *Dumping at Sea Ordinance (DASO) (Cap. 466)*.

8.2.1 Waste Disposal Ordinance (WDO) (Cap 354)

The *WDO* prohibits the unauthorised disposal of wastes, with waste defined as any substance or article which is abandoned. Under the *WDO*, wastes can only be disposed of at licensed waste disposal site. A breach of these regulations can lead to the imposition of a fine and/or a prison sentence. The *WDO* also provides for the issuing of licences for the collection and transport of wastes. Licences for the collection and transport of construction waste or trade waste, however, are not issued currently.

The *Waste Disposal (Charges for Disposal of Construction Waste) Regulation* defined construction waste as any substance, matters or things that is generated from construction work and abandoned, whether or not it has been processed or stockpiled before being abandoned, but does not include any sludge, screening, or matter removed in or generated from any desludging, desilting or dredging works.

The *Construction Waste Disposal Charging Scheme* came into operation on 1 December 2005. Processing of account applications by the EPD started on the same day. A contractor who undertakes construction work with value of HK$1 million or above is required to open a billing account solely for the contract. Charging for the disposal of construction waste started on 20 January 2006.

Depending on the percentage of inert materials in the material, construction waste can be disposed of at public fill reception facilities, landfills and outlying islands transfer facilities, where differing disposal costs would be applied. This scheme encourages waste reduction and hence minimise the costs of the Contractor or Project Proponent.

Table 8.1 summarises the Government waste disposal facilities for construction waste and various charge levels.

Table 8.1 Government Waste Disposal Facilities for Construction Waste

Government Waste Disposal Facilities	Type of Construction Waste Accepted	Charge per Tonne #
Public fill reception facilities	Consisting entirely of inert construction waste ++	HK$27
Sorting facilities	Containing more than 50% by weight of inert construction waste ++	HK$100
Landfills @	Containing not more than 50% by weight of inert construction waste ++	HK$125
Outlying Islands Transfer Facilities @	Containing any percentage of inert construction waste ++	HK$125

Notes:
Except for the Outlying Islands Transfer Facilities, the minimum charge load is 1 tonne, i.e. if a load of waste weighs 1 tonne or less, it will be charged as 1 tonne. A load of waste weighing more than 1 tonne will be charged at 0.1 tonne increment. For Outlying Islands Transfer Facilities, the charge is $12.5 per 0.1 tonne and the minimum charge load is 0.1 tonne.
++ Inert construction waste means rock, rubble, boulder, earth, soil, sand, concrete, asphalt, brick, tile, masonry or used bentonite.
@ If a load of waste contains construction waste and other waste, that load will be regarded as consisting entirely of construction waste for the purpose of calculating the applicable charge.

8.2.2 Waste Disposal (Chemical Waste) (General) Regulation (Cap 354C)

Chemical waste as defined under the *Waste Disposal (Chemical Waste) (General) Regulation* includes any substance being scrap material, or unwanted substances specified under *Schedule 1* of the *Regulation*, if such a substance or chemical occurs in such a form, quantity or concentration so as to cause pollution or constitute a danger to health or risk of pollution to the environment.

Chemical waste producers shall register with the EPD. Any person who contravenes this requirement commits an offence and is liable to a fine and imprisonment. Producers of chemical wastes must treat their wastes, utilising on-site plants licensed by the EPD or have a licensed collector take the wastes to a licensed facility. For each consignment of wastes, the waste producer, collector and disposer of the wastes must sign all relevant parts of a computerised trip ticket. The system is designed to allow the transfer of wastes to be traced from cradle-to-grave.

The *Regulation* prescribes the storage facilities to be provided on site including labelling and warning signs. To minimise the risks of pollution and danger to human health or life, the waste producer is required to prepare and make available written procedures to be observed in the case of emergencies due to spillage, leakage or accidents arising from the storage of chemical wastes. He/she must also provide employees with training in such procedures.

8.2.3 Land (Miscellaneous Provisions) Ordinance (Cap 28)

The inert portion of construction waste (1) (also called public fill) may be taken to public fill reception facilities. Public fill reception facilities are operated by the Civil Engineering and Development Department (CEDD). The *Land (Miscellaneous Provisions) Ordinance* requires that individuals or companies who deliver public fill to the public fill reception facilities to obtain Dumping Licences. The licences are issued by the CEDD under delegated authority from the Director of Lands.

Under the licence conditions, public fill reception facilities will only accept inert earth, soil, sand, rock, boulder, rubble, brick, tile, concrete, asphalt, masonry or used bentonite. In addition, in accordance with paragraph 11 of *Development Bureau (DevB) Technical Circular (Works) (DevB TC(W)) No. 6/2010)*, the Public Fill Committee will advise on the acceptance criteria (eg no mixing of construction waste, nominal size of the materials less than 250mm, etc). The material should, however, be free from marine mud, household refuse, plastic, metal, industrial and chemical wastes, animal and vegetable matter and any other materials considered unsuitable by the public fill reception facility.

8.2.4 Public Cleansing and Prevention of Nuisances Regulation

This *Regulation* provides further control on the illegal dumping of wastes on unauthorised (unlicensed) sites. The illegal dumping of wastes can lead to a fine and/or imprisonment.

8.2.5 Dumping at Sea Ordinance (DASO) (Cap. 466).

Under the DASO, a permit from the Director of Environmental Protection is required if anyone intends to dispose and dump from vessels in the sea. The permit is valid for specific periods of time and stipulates the (1) type and quantity of substances to be dumped; (2) location of the disposal grounds; (3) requirement of equipment for monitoring the disposal operations; and (4) environmental monitoring requirements.

8.2.6 Other Relevant Guidelines

Other relevant guidance documents, which detail how the Project Proponent or Contractor should comply with the local regulations, are as follows:

- *Waste Disposal Plan for Hong Kong* (December 1989), Planning, Environment and Lands Branch Government Secretariat, Hong Kong SAR Government;
- *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes* (1992), EPD, Hong Kong SAR Government;
- *Hong Kong Planning Standards and Guidelines Planning* (2014), Planning Department, Hong Kong SAR Government;
- *WBTC No. 2/93 - Public Dumps,* Works Branch, Hong Kong SAR Government;

(1) "Construction waste" refers to materials arising from any land excavation or formation, civil/building construction, road works, building renovation or demolition activities. It includes various types of reusable materials, building debris, rubble, earth, concrete, timber and mixed site clearance materials. When sorted properly, materials suitable for land reclamation and site formation (known as public fill) should be reused at public fill reception facilities. The rock and concrete can be crushed and processed to produce aggregates for various civil and building engineering applications. The remaining construction waste (comprising timber, paper, plastics, and general refuse) are to be disposed of at landfills.

- *WBTC No. 2/93B - Public Filling Facilities*, Works Branch, Hong Kong SAR Government;
- *WBTC No. 16/96 - Wet Soil in Public Dumps*, Works Branch, Hong Kong SAR Government;
- *Waste Reduction Framework Plan, 1998 to 2007*, Planning, Environment and Lands Bureau, Government Secretariat, 5 November 1998;
- *WBTC No. 4/98 and 4/98A - Use of Public Fill in Reclamation and Earth Filling Projects*, Works Bureau, Hong Kong SAR Government;
- *WBTC No. 25/99, 25/99A and 25/99C - Incorporation of Information on Construction and Demolition Material Management in Public Works Subcommittee Papers,* Works Bureau, Hong Kong SAR Government;
- *WBTC No. 12/2000 - Fill Management*, Works Bureau, Hong Kong SAR Government;
- *WBTC No. 19/2001 - Metallic Site Hoardings and Signboards;* Works Bureau, Hong Kong SAR Government;
- *WBTC No. 11/2002 - Control of Site Crushers*, Works Bureau, Hong Kong SAR Government;
- *WBTC No. 12/2002 - Specifications Facilitating the Use of Recycled Aggregates,* Works Bureau, Hong Kong SAR Government;
- *ETWB TC(W) No. 33/2002 - Management of Construction and Demolition Material Including Rock*, Environment, Transport and Works Bureau, Hong Kong SAR Government;
- *ETWB TC(W) No. 34/2002 - Management of Dredged/ Excavated Sediment,* Environment, Transport and Works Bureau, Hong Kong SAR Government;
- *ETWB TC(W) No. 19/2005 - Environmental Management on Construction Sites*, Environment, Transport and Works Bureau, Hong Kong SAR Government;
- *DevB TC(W) No. 6/2010 - Trip Ticket System for Disposal of Construction & Demolition Materials*, Development Bureau, Hong Kong SAR Government; and
- *Practice Note for Authorized Persons and Registered Structural Engineers No. 252 - Management Framework for Disposal of Dredged/Excavated Sediment*, Buildings Department, Hong Kong SAR Government.

8.3 Expected Waste Arisings during the Construction Phase

During the construction phase, the main activities on land, which include site clearance, civil and building construction works, and marine dredging, will potentially result in the generation of waste. The typical waste types associated with these activities include:

- Waste from site clearance;
- Excavated materials (soil, rock and marine sediments) from the construction of seawater intake and outfall, foundation/ basement of desalination plant and water mains of the trunk feed system (1);
- Dredged marine sediments from the construction of seawater intake and outfall and desalination plant;
- Construction and demolition (C&D) materials from construction of new buildings and civil structures;
- Chemical waste from maintenance of construction plant and equipment; and
- General refuse from construction workforce.

The natural slope overlooking the northeast boundary of the new desalination plant at TKO Area 137 has a history of minor landslides and contains some potentially unstable boulders. Landslide and boulder hazard mitigation works including mainly passive debris barriers and boulder traps along the toe of the natural slope, some soil nailing at local steep spots on the slope, stabilization of individual boulders by buttressing and dowelling may be required to protect the new desalination plant for the landslide and boulder hazards from this slope. Slope mitigation works which involve minor excavation will be conducted and therefore considered to be insignificant.

8.3.1 Site Clearance Waste

The CEDD is currently operating a temporary fill bank at TKO Area 137, which is stockpiled or filled with inert C&D materials with access roads between various parts of the site. The site will be occupied by the temporary fill bank until end of 2018. CEDD has agreed to hand over the 10 ha site cleared of stockpile for this Project by late 2015. Thus the quantity of site clearance waste (eg vegetation) is expected to be small. This will be transferred to the SENT Landfill or North East New Territories (NENT) Landfill for disposal.

8.3.2 Excavated Materials

With reference to the preliminary construction programme, it is estimated that the quantities of excavated materials to be generated from the construction of the seawater intake and outfall, desalination plant and the mains laying are approximately 785 m^3, 402 m^3, 183,720 m^3 and 42,733 m^3, respectively. The construction of desalination plant shall involve slope mitigation works, which will also generate about 56 m^3 of excavated materials. With reference to *"ETWB TC(W) No. 33/2002*

(1) The "desalination plant" includes the pumping station and treated water storage tank of the trunk feed system; and the works related to the fresh water mains of the trunk feed system refers to "mains laying works" hereinafter.

Management of Construction and Demolition Material Including Rock", a C&D Material Management Plan (C&DMMP) has to be submitted with the EIA Report to the Public Fill Committee (PFC) for approval in the event that the Project generates more than 50,000 m^3 of C&D material. The C&DMMP for the Project has been included in *Annex 8A* of this EIA Report and it will be submitted to PFC for approval.

It is assumed that half of the excavation works will be completed in 2017 and 2018, respectively, and all the excavation works will be completed by 2018. With reference to the C&DMMP and *"Geological Profile along the proposed alignment of Intake in Site Investigation Report (8901/B&V/0034)"*, ***Table 8.2a*** below presents the estimation of excavated materials to be generated and fill materials to be required during the construction of the seawater intake and outfall, desalination plant and mains laying.

Table 8.2a Cut and Fill Requirements of the Seawater Intake & Outfall, Desalination Plant and Mains Laying

Locations	Excavated Materials Generated from Construction Works (m^3)	Filled Materials Reused on Site (m^3)	Surplus Excavated Materials (which are Inert C&D Material) Disposed of at Fill Bank as Public Fill (m^3)	Surplus Excavated Materials (which are Non-inert C&D Material) Disposed of at Landfill as Construction Waste (m^3)	Surplus Excavated Materials Disposed of as Marine Sediments (m^3) (d)
Seawater Intake	785	550	79 (a)	0	157 (b)
Seawater Outfall	402	402	0	0	0
Desalination Plant (including slope mitigation works)	183,776 (c)	0	180,173	2,744	859
Mains Laying	42,733	25,961	16,404	368	-
Total	**227,696**	**26,913**	**196,656**	**3,112**	**1,016**

Notes

(a) Assuming 10% of the total excavated materials generated from the construction of seawater intake are Grade IV and V low quality rock unsuitable for on-site filling. The Surplus Excavated Materials Disposed of at Fill Bank as Public Fill = 785 m^3 X 10% = 79 m^3.

(b) Assuming 20% of the total excavated materials generated from the construction of seawater intake are marine sediments. The Surplus Excavated Materials Disposed of as Marine Sediments = 785 m^3 X 20% = 157 m^3.

(c) 145,751 m^3 of the total excavated materials are generated from the construction of foundation/ basement of the desalination plant whilst 37,110 m^3 of the total excavated materials are generated from pilling works. The remaining 859 m^3 of the total excavated materials are marine sediments generated during the excavation. The Excavated Materials Generated from Construction Works = 145,751 m^3 + 37,110 m^3 + 859 m^3 = 183,720 m^3. The excavated material generated from the slope mitigation works is also included into this section and is about 56 m^3. Therefore the total excavated material is 183,720 m^3 + 56 m^3 = 183,776 m^3

(d) Marine sediment generated from land-based construction works.

The excavated materials generated from the construction works will be temporarily stockpiled on-site for subsequent reuse at other parts of the Site. About 12% of the excavated materials will be reused on-site as fill materials for general filling. ***Table 8.2b*** below summarises the estimated quantities of various kinds of excavated materials (excluding marine sediments) generated during the construction works.

Table 8.2b Estimated Quantities of Excavated Materials (Excluding Marine Sediments) Generated during Construction Works

Material	Quantity of Each Type of Materials (m^3)	Quantity of Filled Materials Reused on Site (m^3)	Quantity of Each Type of Materials to be Disposed of at Fill Bank as Public Fill (m^3)	Quantity of Each Type of Materials to be Disposed of at Landfill as Construction Waste (m^3)
Inert C&D Material (soft public fill)	211,232	26,912	184,320	0
Grade I/II Granitic Rock	9,146	0	9,146	0
Rock other than Grade I/II Granite	3,190	0	3,190	0
Broken Concrete	0	0	0	0
Non-inert Construction Waste	3,112	0	0	3,112
Total Volume (m^3)	**226,680**	**26,912**	**196,656**	**3,112**
Total Weight (tonnage)*	**459,528**	**53,824**	**399,480**	**6,224**

Note
* - Converted by figures from *WSD Vetting Committee on C&DMM's memo (Ref. (3) In WSD 1421/58/02 Pt. 17 TJ (1)* dated 9 December 2010. In-situ densities of rock and soil to be 2.5 tonnes/m^3 and 2.0 tonnes/m^3 respectively

The excavation materials from surplus Inert C&D Material, Grade I/II Granitic Rock and Rock other than Grade I/II Granite (about 196,656 m^3 in volume or 399,480 tonnes in weight) will be disposed of at the TKO Area 137 Fill Bank (if it is still in operation) or other public fill reception facilities. The average number of truck trips associated with off-site disposal of surplus excavated materials at the TKO Area 137 Fill Bank will be about 66 trucks per day (1). The TKO Area 137 Fill Bank is adjacent to the site and thus no impact on the traffic in the vicinity of the site is expected. The remaining excavated materials which are construction waste (about 3,112 m^3 in volume or 6,224 tonnes in weight) will be disposed of as construction waste at SENT Landfill or its extension (if implemented) or NENT Landfill. The number of truck trips for off-site disposal of construction waste is about 1 truck trip per day, and no adverse impact to the operation of these facilities is expected.

8.3.3 Dredged Marine Sediments

To minimise the generation of excavated marine sediments, various construction approaches and reuse options have been considered and discussed, including trenchless method for submarine pipeline installation (see *Section 2*). The present

(1) Assuming 25 working days per month and the total working days over the 12-month period is 300 days. 24-tonne trucks with payload of 10 tonnes are used.

proposed work scheme represents a concerted effort to reduce and manage dredged material generation. With the current optimal design, the quantities of dredged marine sediments to be generated from dredging during the construction of seawater intake and outfall are approximately 1,740 m^3 and 4,590 m^3, respectively. Taking account of the excavated marine sediments generated during the construction of seawater intake and piling of the desalination plant as mentioned in ***Table 8.2a***, the total quantity of marine sediments generated will be approximately 7,346 m^3 with a maximum of dredging rate at 3,500 m^3 per day.

A review of available baseline information on sediment quality was conducted and a summary is provided below.

a) EPD Sediment Monitoring Data between 2010 and 2013

The closest EPD sediment monitoring station in the vicinity of the proposed dredging location is station ES1 in the Eastern Buffer Water Control Zone. The results of seabed sediment testing conducted between 2010 and 2013 are presented in ***Table 8.2c***. Based on EPD's sediment quality data collected at ES1, the levels of all contaminants are well below the Lower Chemical Exceedance Level (LCEL). Thus, the sediment in the vicinity of the submarine intake and outfall are anticipated to be Category L sediment as defined under *ETWB TC(W) No. 34/2002 Management Framework for Disposal of Dredged/Excavated Sediment*.

Table 8.2c EPD Sediment Monitoring data between 2010 and 2013 at ES1 of Eastern Buffer Water Control Zone

Contaminants	Mean Concentration in 2010 - 2013	LCEL (1)	UCEL (2)
Metals (mg/kg dry weight)			
Cadmium (Cd)	< 0.1	1.5	4
Chromium (Cr)	23.6	80	160
Copper (Cu)	27.5	65	110
Mercury (Hg)	0.1	0.5	1
Nickel (Ni)	14.4	40	40
Lead (Pb)	28.3	75	110
Silver (Ag)	0.8	1	2
Zinc (Zn)	69.9	200	270
Metalloid (mg/kg dry weight)			
Arsenic (As)	5.7	12	42
Organic PAHs (3) (ug/kg dry weight)			
Low MW PAHs	28.9	550	3160
High MW PAHs	24.4	1700	9600
Organic-non-PAHs (ug/kg dry weight)			
Total PCBs (4)	18.0	23	180

Notes:
(1) Low Chemical Exceedance Level
(2) High Chemical Exceedance Level
(3) Polycyclic aromatic hydrocarbons
(4) Polychlorinated biphenyls

b) Ground Investigation in 2013 and Desktop Data Prior to TKO Area 137 Reclamation

Ground investigation was conducted in the vicinity of the proposed submarine intake and outfall between September and October 2013 (*Figure 1* of *Annex 8B*). A combination of grab samples and vibrocore samples were taken within the proposed locations. Whilst grab samples were taken from seabed, vibrocore samples were taken vertically either down to the proposed dredging depth (i.e. at seabed, 0.9m, 1.9m, 2.9m below seabed, every 3m thereafter and at the end of the vibrocore sampling) or upon refusal, or when encountering rock head in order to determine the depth of contaminated marine deposit. Sediment samples were also collected for chemical testing and the testing results are summarized in ***Table 8.2d*** and detailed in *Annex 8B*.

Table 8.2d Results of testing of sediment samples collected in 2013 during ground investigation of the submarine facilities of the proposed desalination plant

Contaminants	Station								LCEL (1)	UCEL (2)
	GS1 (5)	GS2 (5)	GS3	GS4	D1/SD1	D2/SD2 (5)	D3/SD3	D4/SD4 (6)		
Sampling Depth	**Seabed level**				**Seabed level, 0.9m, 1.9m, 2.9m, and thereafter every 3m to the bottom of the marine deposit**				**-**	**-**
Metals (mg/kg dry weight)										
Cadmium (Cd)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	1.5	4
Chromium (Cr)	32	23	26	25	13	32 - 49	28	11 - 24	80	160
Copper (Cu)	24	17	18	18	13	7 - 30	18	3 - 8	65	110
Mercury (Hg)	0.1	0.08	0.06	0.07	0.12	<0.05 - 0.19	0.11	< 0.05	0.5	1
Nickel (Ni)	17	12	14	13	4	22 - 33	14	5 - 15	40	40
Lead (Pb)	35	28	25	22	37	15 - 38	24	7 - 19	75	110
Silver (Ag)	0.4	0.2	0.2	0.3	0.2	<0.1 - 0.6	0.2	<0.1	1	2
Zinc (Zn)	102	79	74	68	81	69 - 113	65	21 - 54	200	270
Metalloid (mg/kg dry weight)										
Arsenic (As)	8	5	4	3	7	**3 - 14**	5	<1 - 3	12	42
Organic PAHs (3) (ug/kg dry weight)										
Low MW PAHs	<550	<550	<550	<550	<550	<550	<550	<550	550	3160
High MW PAHs	<1,700	<1,700	<1,700	<1,700	<1,700	<1,700	<1,700	<1,700	1700	9600
Organic-non-PAHs (ug/kg dry weight)										
Total PCBs (4)	<18	<18	<18	<18	<18	<18	<18	<18	23	180
Organometallics (ug/ TBTL in interstitial water)										
Tributyltin (TBT)	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.15	0.15

Notes:
(1) Low Chemical Exceedance Level
(2) High Chemical Exceedance Level
(3) Polycyclic aromatic hydrocarbons
(4) Polychlorinated biphenyls
(5) In the close proximity of the dredging extent but outside the direct footprint of the submarine intake structure
(6) Within the dredging extent of the submarine outfall structure

Overall, the collected sediment samples in the vicinity of proposed submarine intake and outfall reported contaminant levels not exceeding the LCEL (Category L), except for the sediment collected from SD2 at a depth of 10.90 – 11.90 m below seabed which is determined as Category M due to the level of Arsenic exceeded the LCEL but below the UCEL. It should be noted that the dredging depth for the proposed submarine intake and outfall is about 4-6m below seabed and SD2 is not located within the direct footprint of the proposed submarine intake. As such, marine dredged sediments arising from the Project are likely to be Category L.

Desktop data are considered to be sufficiently recent (year 2013) and spatially relevant (within or in very close proximity to the proposed dredging areas) to provide an indication of baseline sediment quality; consequently further sediment sampling and testing was not deemed necessary for the EIA. Based on the review of desktop data, the sediment to be dredged during the construction of intake and outfall are

expected to be Category 'L' (1), which will be disposed of at open sea area as instructed by MFC/ CEDD under the *ETWB TC(W) No. 34/2002*.

For the excavated marine sediments arising from piling of the desalination plant (**Table 8.2a** refers), desktop data from the Engineering Feasibility Study of Development of Tseung Kwan O Area 137 (2) reported that the sediments within Junk Bay were contaminated due to historical industrial practices and the influence of contaminants from Victoria Harbour. Among the measured parameters in the sediment collected beneath Area 137, only the level of lead in middle and bottom layers of the sediments exceeded the LCEL but below the UCEL (***Table 8.2e***). Thus the excavated marine sediment arising from piling of desalination plant at Area 137 is expected to be Category M.

Table 8.2e Sediment sampling and testing data of Tseung Kwan O Area 137 Prior to Reclamation

Contaminants	**Concentration range**			**LCEL (1)**	**UCEL (2)**
Sampling Depth	**Top**	**Middle**	**Bottom**	**-**	**-**
Metals (mg/kg dry weight)					
Cadmium (Cd)	< 0.06 - <0.13	< 0.06 - < 0.17	< 0.06 - <0.15	1.5	4
Chromium (Cr)	17 - 29	24 - 30	31 - 45	80	160
Copper (Cu)	4.4 - 14	4.3 - 10	8.1 - 19	65	110
Mercury (Hg)	0.01 - 0.11	0.01 - < 0.04	0.03	0.5	1
Nickel (Ni)	11 - 21	15 - 26	25 - 30	40	40
Lead (Pb)	17 - 57	**18 - 78**	**28 - 78**	75	110
Silver (Ag)	n/a (5)	n/a	n/a	1	2
Zinc (Zn)	50 - 74	60 - 69	70 - 89	200	270

Notes:
(1) Low Chemical Exceedance Level
(2) High Chemical Exceedance Level
(3) Polycyclic aromatic hydrocarbons
(4) Polychlorinated biphenyls
(5) Not available

This 1,016 m^3 excavated marine sediments is proposed to reuse as fill material on-site after cement stabilization. The cement stabilization process is chosen as the remediation option for the contaminated marine sediment to reuse the marine sediment as fill material. The cement stabilized marine sediment shall comply with the criteria agreed by EPD, for example, the Universal Treatment Standards (UTS) and Unconfined Compressive Strength (UCS) standard before reusing as fill materials. In case cement stabilization is not a practical treatment for the excavated marine sediments, the sediments may be disposed according to *ETWB TC(W) No. 34/2002*. The basic requirements and procedures for sediment disposal are specified under the *ETWB TC(W) No. 34/2002*. The management of the dredging, use and disposal of marine mud is monitored by the MFC, while the licensing of marine dumping is the responsibility of the Director of Environmental Protection (DEP).

The results presented in this Report are for EIA purpose only. A proposal for sampling and chemical testing of the sediment will be prepared and submitted to the EPD for approval prior to the commencement of dredging works. The approved detailed sampling and chemical testing will be carried out prior to the commencement of the

(1) Category L: Sediment with all contaminant levels not exceeding the Lower Chemical Exceedance Level (LCEL). The material must be dredged, transported and disposed of in a manner which minimizes the loss of contaminants either into solution or by re-suspension.
(2) APH Consultants (1993) Engineering Feasibility Study of Development of Tseung Kwan O Area 137. Territory Development Department – South Easr New Territories Development Office.

dredging activities to confirm the sediment disposal method. After carrying out the sampling and testing, a Sediment Quality Report (SQR) will be prepared for EPD approval as required under the *Dumping at Sea Ordinance* (DASO). The SQR will include the sampling details, chemical testing results, quality control records, proposed classification and delineation of the sediment according to the requirements of the *ETWB TC(W) No. 34/2002*. Should Category M contaminated materials be encountered in the Project, Tier III biological screening in accordance with *Section 3 of Appendix B* in *ETWB TC(W) No. 34/2002* shall be undertaken to identify the most appropriate disposal option.

The actual quantity and allocation of the disposal site(s) will be based on the results of the SQR to be approved by MFC/ CEDD under the *ETWB TC(W) No. 34/2002*. The project proponent will implement the project in accordance with the DASO and the requirements as stipulated in *ETWB TC(W) No. 34/2002*, prior to the application and allocation of space for dredging and disposal of sediment arising from the project. The proposed disposal options for the respective categories of marine sediment arising from the Project are presented in ***Table 8.2f***.

Table 8.2f Proposed Disposal Options for Different Types of Marine Dredged Sediments Arising from the Project

Sediment Type	In sit Volume (m^3)	Bulk Volume (m^3) (1)	Proposed Disposal Option
Category L	6,330	8,229	Type I Open Sea Disposal to the areas approved by MFC/ CEDD
Category M (2) (M_{pass} and/or M_{fail})	1,016	1,321	Type I Open Sea Disposal at dedicated site if sediment samples passed the biological screening, or Type 2 Confined Marine Disposal if sediment samples failed the biological screening, as approved by MFC/ CEDD
Total	**7,346**	**9,550**	**-**

Note:
(1) Bulk volume with bulking factor of 1.3
(2) In case cement stabilization is not a practical treatment for the excavated marine sediments, the sediments may be disposed according to *ETWB TC(W) No. 34/2002*.

8.3.4 C&D Materials

No demolition works will be required for the Project. C&D materials (consisting of concrete, brick, wood, packing materials, plastics, metal and steel) will be generated from the construction of the civil structures and buildings. The inert portion of the C&D materials is referred to as public fill and the non-inert portion is referred to as construction waste. Public fill will be disposed of at TKO Area 137 Fill Bank (if it is still in operation), or other public fill reception facilities. The construction waste will be disposed of to the SENT Landfill or its extension (if implemented) or NENT Landfill. The gross floor area (GFA) of the buildings to be constructed are summarised in ***Table 8.3***.

Table 8.3 Summary of GFA of Buildings to be Constructed at the Site

Civil Structures and Buildings	Gross Floor Area (m^2)
Desalination Plant	
Incoming Switchgear Room	400
132kV Substation	972
Sludge Filter Press Building	3,290
Sludge Thickener (I)	741
Chlorine Storage (I) & (II)	5,576
Underground Clear Water Storage Tank (I)	500
Chlorine Contact Tank (I)	850
Post Treatment (I)	2,030
Chemical Building	7,020
Maintenance Workshop	442
Reverse Osmosis Building (I) + Secondary Stage Media Filter (I)	11,396
DAF (I)	8,624
First Stage Media Filters (I)	6,720
Administrative Building and Laboratory	3,132
Intake Pumping Station	3,036
Standby Generator & Switchgear Room	154
Treated Water Pump Station + Switchroom (III)	1,586
Sodium Hypochlorite Storage Tanks and Dosing Station	484
Total	**56,953**

With the assumption of 0.1 m^3 of C&D materials generated per m^2 of GFA constructed (1), approximately 5,695 m^3 of C&D materials will be generated from the construction of civil structures and buildings at the project site. To reduce the volume of construction waste to be disposed of at landfill, the C&D materials will be sorted into public fill and construction waste on-site. Assuming the ratio of inert waste to non-inert waste is 8:2 (2), the volumes of public fill and construction waste are estimated to be 4,556 m^3 and 1,139 m^3, respectively. In accordance with the preliminary construction programme, the duration of the building works will be about 12 months. Thus the estimated average public fill and construction waste to be disposed off-site will be about 15.2 m^3/day and 3.80 m^3/day (3), respectively. The public fill will be disposed of at the TKO Area 137 Fill Bank (if it is still in operation), or other public fill facilities, and construction waste will be disposal of at SENT Landfill or its extension (if implemented) or NENT Landfill. Recyclable materials segregated from the construction waste (eg paper, scrap metal, scrap plastic, etc.) will be delivered to recyclers for recycling. The numbers of truck trips associated with off-site disposal of public fill and construction waste will be about 2 and 1 truck trips per day, respectively. With respect to the anticipated small numbers of truck trip to be generated, the potential traffic impact will be negligible. It is not anticipated that the disposal of the small amount of public fill and construction waste to public filling facilities and landfill, respectively will have adverse impact to the operation of these facilities.

(1) Cheung CM, Wong KW, Fan CN and Poon CS (1993), Reduction of Construction Waste: Final Report, The Hong Kong Polytechnic University and Hong Kong Construction Association.

(2) Monitoring of Solid Waste in Hong Kong 1997. Available at https://www.wastereduction.gov.hk/en/materials/info/msw1997.pdf

(3) Assuming 25 working days per month and the total working days over the 12-month period is 300 days.

8.3.5 Chemical Waste

Chemical waste, as defined under the *Waste Disposal (Chemical Waste) (General) Regulation*, includes any unwanted substances specified under *Schedule 1* of the *Regulation*. Substances likely to be generated from the construction and modification works of the Project will include:

- Used paint, engine oils, hydraulic fluids and waste fuel;
- Spent mineral oils/cleaning fluids from mechanical machinery; and
- Spent solvents/ solutions from equipment cleaning activities.

Chemical wastes will pose environmental, health and safety hazards if not stored and disposed of in an appropriate manner as outlined in the *Waste Disposal (Chemical Waste) (General) Regulation* and the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*. These hazards may include:

- Toxic effects to workers;
- Adverse effects on air, water and land from spills; and
- Fire hazards.

It is difficult to quantify the exact amount of chemical waste that will arise from the construction activities since it will be highly dependent on the contractor's on-site maintenance activities and the quantity and/ or types of plant and equipment utilised. With respect to the scale of the construction activities, it is anticipated that the quantity of chemical waste to be generated will be relatively small. The chemical waste will be collected by licensed chemical waste collectors and delivered to the licensed chemical waste treatment facilities for disposal (eg Chemical Waste Treatment Centre (CWTC) in Tsing Yi).

With the incorporation of suitable arrangements for the storage, handling, transportation and disposal of chemical wastes under the requirements stated in the *Waste Disposal (Chemical Waste) (General) Regulation* and the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*, no adverse environmental (including air and odour emissions, noise and wastewater discharge) and health impacts, and hazards will result from the handling, transportation and disposal of chemical waste arising from the Project.

8.3.6 General Refuse

The presence of a construction site with workers and associated site office will result in the generation of general refuse (mainly consists of food waste, aluminium cans, plastic bottles, waste paper and glass bottles) which requires off-site disposal. The storage of general refuse has the potential to give rise to adverse environmental impacts, if not properly managed. These include odour if the waste is not collected frequently, windblown litter and visual impact.

It is conservatively estimated that a maximum of about 160 construction workers will be working on site at any one time. With a general refuse generation rate of 0.65 kg

per worker per day, the maximum amount of general refuse to be generated will be about 104 kg per day.

To reduce the quantity of general refuse to be disposed of at landfill, recyclable materials (i.e. paper, plastic bottles, aluminium cans and glass bottles) will be segregated on-site for off-site recycling, as far as practicable. Adequate number of enclosed waste containers and recycling bins will be provided to avoid over-spillage of waste and/ or recyclable materials.

The non-recyclable refuse will be placed in bags and stored in enclosed containers, and disposed of on a daily basis to the West Kowloon Transfer Station/ Sha Tin Transfer Station. Given that the quantity of general refuse to be disposed of at landfill is small, no adverse impact on the operation of the refuse transfer station is anticipated.

With the implementation of the mitigation measures recommended in *Section 8.5*, no adverse environmental impacts (including potential hazard, dust emissions, noise and wastewater discharge) caused by storage, handling, transport and disposal of general refuse are expected.

8.4 Expected Waste Arisings during the Operation Phase

During the operation of the desalination plant, the major waste types to be generated include:

- Dewatered sludge from the pre-treatment system and filter backwash;
- Chemical waste from maintenance of the plant and equipment; and
- General Refuse from operators.

8.4.1 Dewatered Sludge

The desalination plant is designed with an initial capacity of 50 million tpa, expandable to an ultimate capacity of 90 million tpa in the future. With respect to the preliminary design, seawater will be drawn from the seawater intake system to the pre-treatment system for pre-treatment by clarification followed by filtration prior to the Seawater Reverse Osmosis (SWRO) process. Coagulant/ polymer will be added to feed water for coagulation and flocculation. The chemicals to be used in various treatment processes are summarised in ***Table 8.4*** below.

Table 8.4 Summary of Chemicals to be Used in Various Treatment Processes

Chemicals	Treatment Processes and Purpose
Sodium Hypochlorite	Pretreatment - Bio growth control
Ferric Chloride or Alum	Pretreatment - Coagulation
Sulphuric Acid	Pretreatment - pH Adjustment
Polymer	Pretreatment - Flocculation
Sodium meta Bisulphite	Pretreatment - Dechlorination
Antiscalant	RO membranes - Scaling control
Sodium Hydroxide	RO membranes - pH adjustment (if required)
Carbon Dioxide	Post Treatment - pH adjustment and remineralisation
Hydrated Lime	Post Treatment - pH adjustment and remineralisation
Sodium Silicofluoride	Post Treatment – Fluoridation for teeth protection

Chemicals	Treatment Processes and Purpose
Liquid Chlorine	Post Treatment - Final disinfection
Polymer	Sludge Conditioning - Sludge Thickening/Dewatering

The amount of grit/screenings to be generated from the preliminary screening process before the seawater entering the intake sump is considered to be negligible. The sludge generated from clarification and filter backwash will be thickened and dewatered to 30% dry solids content by weight. The estimated generation rates of dewatered sludge from the plant are approximately 27 tpd and 55 tpd with the treatment capacity of 135 million liter per day (MLD) and 270 MLD, respectively. The dewatered sludge will be transported by trucks/ barges for disposal at the landfill.

The maximum number of truck trips associated with off-site disposal of the dewatered sludge will be about 6 truck trips per day. With respect to the anticipated small number of truck trip to be generated, the potential traffic impact will be negligible. It is not anticipated that the disposal of the small amount of dewatered sludge to NENT or West New Territories (WENT) Landfills will have adverse impact to the operation of the landfill.

8.4.2 Chemical Waste

Limited chemical waste (mainly waste lube oil, spent solvents, waste paint from maintenance of mechanical and electrical equipment and waste chemicals containers for various treatment processes) will arise from the operation activities of the plant. In addition, following chemical reactions between the chemicals listed in *Table 8.4* and the water or sludge, the chemicals will be converted to other physical and chemical forms and will become part of the water and/ or sludge. It is anticipated that the quantity of chemical waste to be generated during the operation phase will be small depending on the maintenance schedule.

With the incorporation of suitable arrangements for storage, handling, transportation and disposal of chemical wastes in accordance with the requirements stated in the *Waste Disposal (Chemical Waste) (General) Regulation* and the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*, no adverse environmental (including air and odour emissions, and water quality) and health impacts, and hazards will result from the handling, transportation and disposal of chemical waste arising from the operation of the Project.

8.4.3 General Refuse

General refuse will arise from the operators and visitors during the operation phase. General refuse may consist of food waste, plastic, glass bottles, aluminium cans and waste paper. It is estimated up to about 40 operators will be working on-site and 60 visitors will be visiting the plant each day. With an estimated general refuse disposal rate of 0.65 kg per capita per day, the amount of general refuse to be disposed of by the operators will be about 65 kg per day while the amount of general refuse generated by visitors is considered to be negligible. With the provision of recycling bins at the plant and promotion of the waste mininisation and recycling initiatives, it is anticipated that the recycling rate will be high and that the total general refuse to be disposed of is likely to be lower. Source separation will be conducted throughout the plant. Recyclable materials (i.e. paper, plastic bottles, aluminium cans and glass bottles) will

be separated for recycling, in order to reduce the amount of general refuse to be disposed of at landfill.

The non-recyclable waste will be delivered to the West Kowloon Transfer Station/ Sha Tin Transfer Station on a daily basis. With respect to the small quantity of general refuse to be disposed of at the transfer station, no adverse impact on the operation of the transfer station is anticipated. With the implementation of the mitigation measures recommended in *Section 8.5.2,* no adverse environmental impacts (including potential hazard, air and odour emissions, noise and wastewater discharge) caused by the storage, handling, transport and disposal of general refuse are expected.

8.5 Mitigation Measures

8.5.1 Construction Phase

The assessment indicates that with the implementation of the proposed waste management practices at the work site, no adverse environmental impacts are envisaged for the handling, collection and disposal of waste arising during the construction phase of the Project.

This *Section* further describes the good construction site practices to avoid or further reduce the potential environmental impacts associated with the handling, collection and disposal of construction and chemical wastes arising from the construction.

The contractor(s) must ensure that all the necessary waste disposal and marine dumping permits or licences are obtained prior to the commencement of the construction works.

a) Management of Waste Disposal

The contractor(s) will open a billing account with the EPD in accordance with the *Waste Disposal (Charges for Disposal of Construction Waste) Regulation*. Every construction waste or public fill load to be transferred to Government waste disposal facilities (eg public fill reception facilities, sorting facilities and landfills) will be provided with a valid "chit" which contains the information of the account holder to facilitate waste transaction recording and billing to the waste producer. A trip-ticket system will also be established in accordance with *DevB TC(W) No. 6/2010* to monitor the disposal of construction waste at landfill and to control fly-tipping. The trip-ticket system will be included as one of the contractual requirements and implemented by the contractor(s).

A waste management plan (WMP) as stated in the "*ETWB TC(W) No. 19/2005, Environmental Management on Construction Sites"* for the amount of waste generated, recycled and disposed of (including the disposal sites) will be established and implemented during the construction phase as part of the Environmental Management Plan (EMP). The Contractor will be required to prepare the EMP and submit it to the Architect/ Engineer under the Contract for approval prior to implementation.

b) Measures for the Disposal of Dredged Marine Sediments

The management of dredged/ excavated sediment management requirement from *ETWB TC(W) No. 34/2002* will be incorporated in the Specification of the Contract Documents.

c) Measures for the Reduction of Excavation Materials and Construction Waste Generation

Most of the excavated materials are expected to be reused on site as fill materials for general filling. A surplus of about 200,784 m^3 of excavated materials will require off-site disposal, of which 196,656 m^3 of inert C&D materials will be disposed off-site to the public fill reception facilities; 3,112 m^3 of non-inert C&D materials will be disposed of at SENT Landfill or its extension (if implemented) or NENT Landfill; and the remaining 1,016 m^3 of the excavated materials will be reused as fill materials on-site after cement stabilization or will be disposed with the dredged marine sediments in case cement stabilization is not a practical treatment. The C&DMMP for the Project has been prepared in accordance with the *ETWB TC(W) No. 33/2002* and included in *Annex 8A* of this EIA Report. The C&DMMP will facilitate the contractor(s) in the preparation of WMP and to manage the surplus excavated materials and minimise C&D materials during construction phase.

C&D materials will be segregated on-site into public fill and construction waste and stored in different containers or skips to facilitate reuse of the public fill and proper disposal of the construction waste. Specific areas of the Site will be designated for such segregation and storage if immediate use is not practicable. Prefabrication will be adopted as far as practicable to reduce the construction waste arisings.

d) Measures for Management of Chemical Waste

The contractor(s) will register as a chemical waste producer with the EPD. Chemical waste will be handled in accordance with the *Code of Practice on the Packaging, Handling and Storage of Chemical Wastes* as listed below.

Containers used for storage of chemical wastes will:

- Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed;
- Have a capacity of less than 450 L unless the specifications have been approved by the EPD; and
- Display a label in English and Chinese in accordance with instructions prescribed in *Schedule 2* of the *Regulations*.

The storage area for chemical wastes will:

- Be clearly labelled and used solely for the storage of chemical waste;
- Be enclosed on at least 3 sides;
- Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest;
- Have adequate ventilation;
- Be covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and

- Be arranged so that incompatible materials are appropriately separated.

Chemical waste will be disposed of:

- Via a licensed waste collector; and
- To a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility which also offers a chemical waste collection service and can supply the necessary storage containers.

e) Measures for Management of General Refuse

General refuse will be stored in enclosed bins separately from construction and chemical wastes. The general refuse will be delivered to the West Kowloon Transfer Station/ Sha Tin Transfer Station, separately from construction and chemical wastes, on a daily basis to reduce odour, pest and litter impacts.

Recycling bins will be provided at strategic locations within the Site to facilitate recovery of recyclable materials (including aluminium can, waste paper, glass bottles and plastic bottles) from the Site. Materials recovered will be sold for recycling.

In addition, to avoid any odour and litter impact, accurate number of portable toilets will be provided for workers on-site.

f) Staff Training

At the commencement of the construction works, training will be provided to workers on the concepts of site cleanliness and on appropriate waste management procedures, including waste reduction, reuse and recycling.

8.5.2 Operation Phase

a) Dewatered Sludge

Thickened and dewatered sludge from the plant will be transported to the landfill by trucks. The requirement on the minimum dry solid content (30%) in the dewatered sludge to be disposed of at landfills as stipulated in the WDO will be incorporated in the Specification of the Contract Documents.

b) Measures for Management of Chemical Waste

The measures for management of chemical waste during operation phase are similar to those outlined in *Section 8.5.1*.

c) Measures for Management of General Refuse

Management approach of general refuse arises from the on-site operators and visitors to the plant during operation phase will be similar to that in construction phase. General refuse and non-recyclables will be stored in enclosed bins and transferred to the West Kowloon Transfer Station/ Sha Tin Transfer Station on a daily basis for avoidance of pest and ordour nuisance. Recycling bins for recyclable materials (including aluminium can, waste paper, glass bottles and plastic bottles) will be placed

at the visitor/ admin/ lab building and transported off-site for recycling on a regular basis.

8.6 Residual Environmental Impacts

No residual waste management impact is envisaged during the construction and operation phases of the Project.

8.7 Environmental Monitoring and Audit

8.7.1 Construction Phase

It is recommended that weekly audits of the waste management practices be carried out during the construction phase to determine if wastes are being managed in accordance with the recommended good site practices, WMP and C&DMMP. The audits will investigate all aspects of waste management including waste generation, storage, handling, recycling, transportation and disposal.

8.7.2 Operation Phase

No EM&A requirements will be required for the operation phase.

8.8 Conclusions

The estimated waste arisings and recommend waste management arrangements during the construction and operation phases of the Project are summarised in ***Table 8.5***.

Table 8.5 Summary of Estimated Waste Arisings and Recommended Waste Management Arrangements

Types of Waste	Quantity	Treatment Options/ Disposal Locations
Construction Phase		
Site Clearance Waste	Small	SENT Landfill or NENT Landfill
Excavated Materials generated from the Construction of the Seawater Intake and Outfall, Desalination Plant and Mains Laying (Except excavated marine sediments)	227,696 m^3 (of which 26,913 m^3 is reused onsite as filled materials, 196,656 m^3 is inert C&D material and 3,112 m^3 is non-inert C&D material)	Excavated materials will be reused on-site as fill materials as far as practicable. 196,656 m^3 of surplus excavated materials (which are inert C&D materials) will be disposed of at TKO Area 137 Fill Bank (if it is still in operation) or other public fill reception facilities; 3,112 m^3 of the surplus excavated materials (which are non-inert C&D waste) will be disposed of at SENT Landfill or its extension (if implemented) or NENT Landfill; and 1,016 m^3 of the surplus excavated materials will be reused as fill materials on-site after cement stabilization or will be disposed with the dredged marine sediments in case cement stabilization is not a practical treatment.
Marine Sediments	7,346 m^3 (*in situ* volume): Intake: 1,740 m^3 Outfall: 4,590 m^3	To be disposed of at specific area as instructed by MFC/ CEDD under the *ETWB TC(W) No. 34/2002* for Category 'L' and Category 'M' sediments. The project proponent will implement the project in accordance with the DASO and the requirements as stipulated in *ETWB TC(W) No. 34/2002*, prior to the application and allocation of space for dredging and disposal of sediment arising from the project.
	Excavated marine sediments from piling of desalination plant: 1,016 m^3	To be reused as fill material on-site after cement stabilization. In case cement stabilization is not a practical treatment for the excavated marine sediments, the sediments may be disposed according to *ETWB TC(W) No. 34/2002*.
Inert C&D Material – public fill generated during the building works	4,556 m^3 (Section 8.3.4 refers)	Disposed of at TKO Area 137 Fill Bank (if it is still in operation), or other pubic fill reception facilities.
Non-inert C&D Material – C&D waste generated during the building works	1,139 m^3 (Section 8.3.4 refers)	SENT Landfill or its extension (if implemented) or NENT Landfill
Chemical Waste	Small	CWTC or other licensed chemical waste recycling or treatment facilities

Types of Waste	Quantity	Treatment Options/ Disposal Locations
General Refuse	104 kg per day	Recyclable materials: on-site sorting and off-site recycling Non-recyclable refuse: West Kowloon Transfer Station/ Sha Tin Transfer Station
Operation Phase		
Dewatered Sludge	27 tpd (with plant treatment capacity of 135 MLD) 55 tpd (with plant treatment capacity of 270 MLD)	WENT or NENT Landfills
Chemical Waste	Small	CWTC or other licensed chemical waste recycling or treatment facilities
General Refuse	65 kg per day	Recyclable materials: on-site sorting and off-site recycling. Non-recyclable refuse: West Kowloon Transfer Station/ Sha Tin Transfer Station

8.8.1 Construction Phase

It is estimated that a total of about 227,696 m^3 of excavated materials will be generated from the construction of the seawater intake and outfall, basement/ foundation and piling works of the desalination plant and the mains laying works, of which 26,913 m^3 of the excavated materials will be reused on-site for general filling. A surplus of about 196,656 m^3 of the excavated materials (inert C&D) will be disposed off-site to the public fill reception facilities; 3,112 m^3 of the excavated materials (non-inert C&D) will be disposed of at SENT Landfill or its extension (if implemented) or NENT Landfill; and 1,016 m^3 of the excavated materials will be reused on-site as fill materials after cement stabilization far as practicable or will be disposed as dredged marine sediments (*ETWB TC(W) No. 34/2002*) in case cement stabilization is not a practical treatment. With reference to *ETWB TC(W) No. 33/2002*, a C&DMMP for the Project has been prepared and included in *Annex 8A* of this EIA Report. With the inclusion of marine sediments generated from excavation (1,016 m^3), it is estimated that a total of 7,346 m^3 of marine sediments will be generated from the construction of seawater intake and outfall and desalination plant (including slope mitigation works). The marine sediments will be disposed of in accordance with *ETWB TC(W) No. 34/2002*. The project proponent will implement the project in accordance with the DASO and the requirements as stipulated in *ETWB TC(W) No. 34/2002*, prior to the application and allocation of space for dredging and disposal of sediment arising from the project.

During the construction of civil structures and buildings within the Site, it is estimated that a total of about 4,556 m^3 of public fill and 1,139 m^3 of construction waste will be generated. The public fill and the construction waste will be disposed of at TKO Area 137 Fill Bank (if it is still in operation), or other public fill reception facilities and landfill, respectively.

With respect to the scale of the construction activities, it is anticipated that the quantity of chemical waste to be generated will be small. It is also estimated that about 104 kg of general refuse will be generated per day by the construction workers. With the implementation of general good construction site practices, the construction of the

Project will not cause adverse waste management, traffic or environmental impacts (including potential hazard, air and odour emissions, noise and water quality).

8.8.2 Operation Phase

It is estimated that about 27 tpd and 55 tpd of dewatered sludge (with a minimum dry solid content of 30%) will be generated from the desalination plant with the treatment capacity of 135 MLD and 270 MLD, respectively. The dewatered sludge will be transferred to landfill by trucks.

Similar to the construction phase, chemical waste arises from operation activities of the plant is expected to be small. It is estimated that a total of approximately 65 kg of general refuse will be generated from the operation of the plant on a daily basis. To facilitate waste avoidance and minimisation, recyclable materials will be sorted on-site with the use of recycling bins. The non-recyclable refuses will be delivered to West Kowloon Transfer Station/ Sha Tin Transfer Station.

With good site practices and proper operation and maintenance of the facilities, the potential environmental impacts (including potential hazard, air and odour emissions, noise and water quality) associated with the storage, handling, collection, transport and disposal of waste arising from the operation of the Project will meet the criteria specified in the *EIAO-TM* and no adverse waste management impacts are anticipated.