13 Conclusions

13.1 Introduction

This Environmental Impact Assessment (EIA) report presents an assessment of the potential environmental impacts associated with the construction and operation of the Project (I·PARK2). The assessment has been conducted in accordance with the requirements of the Technical Memorandum of EIA Process (EIAO-TM) and the EIA Study Brief (No. ESB-365/2024) issued under the EIA Ordinance (EIAO), covering the following environmental aspects:

- Air Quality Impact
- Noise Impact
- Water Quality Impact
- Waste Management Implications
- Ecological Impact
- Fisheries Impact
- Visual Impact
- Health Impact
- Landfill Gas Hazard

The findings of this EIA Study have determined the likely nature and extent of environmental impacts predicted to arise from the construction and operation of the Project. During the EIA process, specific environmental control and mitigation measures have been identified and incorporated into the planning and design of the Project in order to achieve compliance with environmental legislation and standards during both the construction and operation phases. An environmental monitoring and audit (EM&A) programme has also been developed.

A summary of the environmental outcomes/benefits that have accrued from the environmental considerations and analysis during the EIA study and a summary of key findings of the EIA Study are presented in the sections below.

13.2 Summary of Key Environmental Outcomes

13.2.1 Key Environmental Problems Avoided

At present, an average of about 11,100 tonnes of municipal solid waste (MSW)[1] are disposed of at landfills in Hong Kong per day. Currently, there are three strategic landfills in operation, namely, the South East New Territories (SENT) Landfill in Tseung Kwan O, the North East New Territories (NENT) Landfill in Ta Kwu Ling and the West New Territories (WENT) Landfill in Tuen Mun. Among these three landfills, only the NENT Landfill and WENT Landfill receive MSW[2] of around 5,200 and 5,900 tonnes respectively per day.

In the Waste Blueprint for Hong Kong 2035 (the Blueprint), the Government sets out the vision to move away from the reliance on landfills for direct disposal of MSW by around 2035. The Government's strategy has two main directions. The first is to mobilise the entire community to practise waste reduction and waste separation for recycling in the upstream to reduce the overall waste disposal amount. The second is to proactively drive the development of downstream waste-to-energy (WtE) facilities for sustainable disposal of the remaining MSW. According to the strategies set out in the Blueprint, should there be sufficient WtE and waste-to-resources facilities in place by around 2035, we will no longer need to rely on landfills for direct disposal of MSW. By then, only waste that is non-combustible and cannot be recycled or reused, such as construction waste, will be disposed of at the landfills.

The Environmental Protection Department (EPD) is pressing ahead with the development of a network of advanced and highly efficient modern WtE facilities, including modern WtE incinerators and food waste treatment facilities, with a view to moving away from the reliance on landfill for direct disposal of MSW and transforming waste into useful energy resources. Regarding the development of modern WtE incinerators, with the Integrated Waste Management Facilities Phase 1 (I·PARK1) under construction and the proposed Integrated Waste Management Facilities Phase 2 (I·PARK2), Hong Kong's MSW incineration capacity will reach 9,000 tonnes per day. Upon commissioning of the proposed I·PARK2, the NENT Landfill will completely cease MSW reception and will be transformed to receive construction waste only, which does not decay and is odourless, thereby eliminating the odour problem arising from MSW reception. The Government will continue to exert efforts to promote waste reduction and recycling, aiming to achieve "Zero Landfill" in around 2035 and refraining from reliance on direct landfill disposal for MSW.

[1] The figure is based on the Waste Statistics for 2022. In addition, about 4,100 tonnes of construction waste are transported to landfills for disposal per day.

[2] With effect from 6 January 2016, the SENT Landfill and its extension are solely for reception of construction waste for disposal. The NENT Landfill and WENT Landfill currently can receive MSW and construction waste.

13.2.2 Benefits of the Project

The Project will adopt state-of-the-art incineration technology to substantially reduce the bulk size of waste through incineration process and recovery of useful resources such as metals and treated Incinerator Bottom Ash (IBA), which can reduce the amount of MSW to be disposed of at landfills substantially. The heat energy from waste incineration process will be recovered for electricity generation. Apart from meeting the electricity demand of the facility, surplus electricity from the Project will be exported to the public power grid, thereby boosting up the portion of electricity generation from WtE source. This can help reduce electricity generation by fossil fuel and greenhouse gas emissions such as methane generated from decomposition of MSW in landfill. Moreover, appropriate community facilities that will meet the needs of the public will be integrated into the Project to allow members of public to benefit.

13.2.3 Environmentally Friendly Options Considered and Environmental Designs Recommended

Environmental considerations were taken into account in the selection of preferred option, design and construction method of the Project as detailed in **Section 2**. Key environmentally friendly designs that have been considered for the Project include the following:

- The treatment capacity of I·PARK2 has been optimized to maximize the WtE benefit within the available land resource.
- Proper incinerator design in such a way that the waste is thoroughly combusted at high temperature above 850℃ with sufficient air supply under high turbulent condition for at least two seconds to ensure effective destruction of organic pollutants including dioxin. I·PARK2 shall be designed to meet stringent target emission levels for the incinerator, in particular a more stringent target hourly NOx emission level of 60 mg/Nm^3 with a view to minimising potential air quality impact.
- Enclosed design for wastewater treatment facility, waste reception hall, waste storage areas and waste feed system maintained at negative pressure by withdrawing the air through the bunkers into the combustion chamber of the incinerator for combustion and treated by flue gas treatment system before discharge into open atmosphere.
- Provision of berthing facilities to allow direct transport of MSW and incinerator ash mainly by sea to and fro I·PARK2 with a view to minimising the number of waste and incinerator ash container trucks passing through the existing Lung Kwu Tan Road and other road network.
- Effluent outfall is needed for discharge of brine from desalination plant and seawater cooling effluent from seawater cooling system (if adopted) into the sea. Seawall effluent outfall will be adopted and located at the artificial seawall with low ecological and fisheries value, avoiding direct loss of marine habitat and fishing ground and indirect

environmental disturbances (e.g. changes of water quality) associated with submarine outfall construction.

- For the spent seawater cooling effluent discharge, alternative seawall outfall locations have been considered at West Ash Lagoon, which is located further away from the oyster culture activities in Deep Bay with a view to reducing the potential water quality and fisheries impact.
- Percussive pilling method should be avoided as far as practicable to minimize noise disturbances.
- The non-dredged method, i.e. Deep Cement Mixing (DCM) will be adopted for construction of the berthing facility to minimize dredging and the associated impacts on the water quality and marine ecology and fisheries resources as well as the need for sediment disposal.

13.2.4 Environmental Protection Measures and Associated Environmental Benefits

The environmental protection measures recommended for the Project are listing in the Implementation Schedules provided in the standalone EM&A Manual. The recommended environmental protection measures would have the following key environmental benefits.

- Avoid and / or minimize air quality, water quality, noise and visual impacts from the Project.
- Promote sustainable waste management.
- Prevent environmental nuisances from waste handling, storage and disposal.
- Protect sensitive ecological and fisheries resources from direct and indirect disturbances from construction and operational activities.
- Protect the workers in I·PARK2 and health sensitive receivers in the surroundings from adverse health impact.
- The safety of all personnel and general public (i.e. visitors) presence at the proposed Project site would be safeguarded from adverse landfill gas hazard.

13.2.5 Key Population and Environmental Sensitive Areas Protected

Population and environmental sensitive areas in the vicinity of the Project site have been protected through the avoidance and/or minimization of environmental impacts from the construction and operation the Project.

The Project site comprises existing wasteland, developed area and ash lagoon. No ecological sensitive areas would be directly affected. The natural habitat identified within the assessment area including woodland, shrubland and the associated species of conservation importance will be protected under the Project.

Population protected from air quality impacts due to proposed mitigation measures for the construction and operation of the Project comprise the offices of government facilities and industrial establishment in Tsang Tsui, residential uses at Ha Pak Nai, Sheung Pak Nai and Nim Wan Road and Lau Ancestral (place of worship) in Lung Kwu Sheung Tan.

Key sensitive areas protected from adverse water quality impacts include marine ecological sensitive receivers such as the mudflat, seagrass, horseshoe crab and Site of Special Scientific Interest (SSSI) at Pak Nai and fisheries sensitive receivers such as the oyster production area in Deep Bay.

13.2.6 Compensation Areas

No species nor habitat of conservation importance would be adversely affected by the Project. Compensation measure is considered not necessary for the Project. No compensation area is proposed under this Project.

13.3 Summary of Environmental Impacts

The key assessment assumptions and limitations of methodologies and summary of environmental impacts with proposed mitigation measures are presented in **Appendices 13A** and **13B**, respectively.

13.3.1 Air Quality Impact

13.3.1.1 Construction Phase

Potential air quality impacts arising from construction activities of the Project have been considered and evaluated in the EIA. With implementation of the good engineering practice and requirements as stipulated in the Air Pollution Control (Construction Dust) Regulation and the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation and proposed mitigation measures specified in **Section 3.10.1**, no adverse impact on air sensitive receivers (ASRs) during construction phase of the Project is anticipated. Continuous dust monitoring shall be conducted during the construction phase of the Project to check the effectiveness of the air quality control measures, and to ensure the compliance with the requirements set out in the EIA report.

13.3.1.2 Operation Phase

During the operation of the I·PARK2, the potential sources of air quality impacts include air emissions from the stacks of incineration process and odour nuisance.

The I·PARK2 facilities including wastewater treatment facility, waste reception hall, waste storage areas, waste feed system and IBA treatment plant will be enclosed and maintained at negative pressure by withdrawing the air through the bunkers. Odorous air of the wastewater treatment facilities, waste reception hall, waste storage areas. waste feed system and IBA treatment plant will be withdrawn into the combustion chamber of the incinerator for combustion and treated by flue gas treatment system before discharge. The incinerator furnace will be designed with proper control of combustion gas temperature, residence time, air supply and gas turbulence to ensure effective destruction of odorous substances in the waste gas. Odour control system with odour removal efficiency of more than 95% shall be provided for treatment of odorous air before discharging into open atmosphere during a shut-down or under the circumstances that the odorous air cannot be withdrawn into the combustion chamber of the incinerator for combustion.

The incinerator shall be designed, equipped, built and operated in such a way that the waste is thoroughly combusted at high temperature above 850℃ with sufficient air supply under high turbulent condition for at least two seconds to ensure the effective destruction of organic pollutants including dioxin. The I·PARK2 shall be designed to meet the target emission levels for the incinerator presented in **Table 2-2** of the EIA report by making reference to the standards for pollution control on the MSW incineration in the Mainland China (GB 18485-2014) and Shenzhen (SZDB/Z 233-2017), the best available techniques (BAT) reference document for waste incineration in the European Union (EU), as well as the prevailing guidance note on the best practicable means (BPM) for incinerators (municipal waste incineration) in Hong Kong. In particular, the I·PARK2 will meet a more stringent target hourly NOx emission level of 60 mg/Nm^3 with a view to minimising potential air quality impact.

The I·PARK2 contractor will be required to adopt advanced air pollution control system and ensure compliance with the target air emission levels and criteria for evaluating air quality impact set out in Annex 4 of the EIAO-TM.

The cumulative air quality and odour impact assessment results show that all the representative ASRs in the vicinity of the Project site would comply with the Air Quality Objectives and criteria for evaluating air quality impact set out in Annex 4 if the EIAO-TM. Hence, adverse air quality impact arising from operation phase of the Project is not anticipated. As the incinerator at I·PARK2 is a specified process under Cap. 311 Air Pollution Control Ordinance (APCO), the I·PARK2 contractor shall be required to obtain a licence pursuant to section 14 of the APCO and comply with the terms and conditions in the licence.

The I·PARK2 contractor shall conduct stack monitoring during the incineration process in accordance with the monitoring requirements in the prevailing guidance note on the BPM for incinerators (municipal waste incineration) in Hong Kong to ensure that the emissions from the stack will meet the proposed target emission levels for the incinerator. The monitoring requirements given in the EM&A Manual of this Project shall also be followed. Besides, odour patrol will be carried out during operation of the Project to ensure that there would be no adverse odour impact arising from the Project. The monitoring of emissions from the IBA treatment facility shall be carried out on a regular basis upon the commissioning.

13.3.2 Noise Impact

No existing, committed or planned noise sensitive receiver (NSR) is identified within 300m from the boundary of the I·PARK2 site. Adverse noise impacts from the I·PARK2 site are not anticipated during both construction and operation phases. Practicable measures such as quieter construction methods and construction equipment set out in the Professional Persons Environmental Consultative Committee Practice Note (ProPECC) PN 1/24 "Minimizing Noise from Construction Activities" and noise control techniques such as selection of quiet equipment, use of enclosure or silencer set out in the "Good Practices on the Control of Noise from Electrical & Mechanical Systems" promulgated by EPD will be adopted as far as practicable with a view to minimising noise from construction activities during construction phase and fixed noise sources such as fan units during operation phase. The I·PARK2 contractor shall also be required to ensure compliance with the EIAO-TM and Noise Control Ordinance (Cap. 400).

The potential traffic noise impact due to the off-site traffic along Lung Kwu Tan Road has been reviewed in the EIA. Upon the operation of the Project, it is anticipated that the number of waste collection vehicles passing through the existing Lung Kwu Tan Road will be similar to the prevailing scenario of MSW delivery to WENT Landfill. Given that the peak traffic generated by the Project to the Lung Kwu Tan Road is insignificant and would not fall within night time or early morning (i.e. between 11pm and 7am), adverse road traffic noise impact due to the Project is not anticipated.

Currently, MSW loaded in containers is delivered to the berth of WENT Landfill and its extension by marine vessels along the northern seafront of the I·PARK2. During the operational phase of the Project, some vessels originally planned to deliver MSW to the WENT Landfill and its extension will be diverted to the I·PARK2 while ashes from I·PARK2 might be transported off-site by marine vessels. Under the latest estimation, only 1 to 2 additional marine vessels per day would be anticipated during operation. Given that there is no NSR identified within the 300m assessment area from the boundary of the Project and minimal no. of vessel trips induced from the Project per day, adverse marine traffic noise impact due to the Project is not anticipated.

13.3.3 Water Quality Impact

13.3.3.1 Construction Phase

13.3.3.1.1 Land-based Impact

The key sources of water quality impact arising during the land-based construction of the Project include the construction site runoff and drainage, wastewater generated from general construction activities, accidental spillage, general refuse and sewage from the workforce. The impacts could be mitigated and controlled by implementing the recommended mitigation measures set out in the ProPECC PN 2/23 "Construction Site Drainage". The I·PARK2 contractor shall be required to obtain a licence under Cap. 358 Water Pollution Control Ordinance (WPCO) before commencement of any discharge subject to control of the WPCO and comply with the terms and conditions in the licence including the monitoring requirements. No adverse water quality impacts are anticipated.

13.3.3.1.2 Marine-based Impact

Marine-based water quality impact would arise from the seawall modification and construction of new berthing facility for I·PARK2. Non-dredged method (i.e. DCM) is recommended for the proposed marine construction works. The DCM method enables *in-situ* stabilisation of the underlaying sediments without excavation, dredging, shoring or dewatering, and thus there is less exposure of wastes to the water environment. By placing the sand blanket layer on top of the DCM works areas before the DCM treatment, release of fines and cement slurry from the DCM operation is expected to be negligible.

The water quality impacts due to the sand blanket laying work have been quantitatively assessed by mathematical modelling. Suspended solid (SS) is identified as the key parameter of concern. It is predicted that the SS elevations and sedimentation caused by the small-scale sand blanket laying works would be insignificant. Full water quality compliances are predicted at all representative water sensitive receivers (WSRs) under the unmitigated scenario. Precautionary measures including the deployment of silt curtains would be implemented during the marine construction works to ensure the water quality in the vicinity will not be affected

13.3.3.2 Operational Phase

Change of coastline configuration due to the seawall modification and new berthing facility as well as discharge of the brine from desalination plant and seawater cooling effluent seawater cooling system (if adopted) into the sea could affect the local hydrodynamics and water quality conditions.. The potential change in hydrodynamics and water quality due to the I·PARK2 operation was assessed by means of mathematical modelling. The hydrodynamics regimes in the assessment area are predicted to be similar before and after the implementation of I·PARK2. The mixing zones of the proposed brine and spent seawater cooling effluent

discharges are predicted to be localized and would not encroach on any WSRs. Full water quality compliances for all concerned parameters are predicted. Apart from the above, wastewater arising from operation of the Project shall be treated for reuse within I·PARK2 or discharged into the existing Urmston Road Submarine Outfall in the North Western Water Control Zone outside Deep Bay after meeting relevant standards. Similar to discharge of effluent from construction site, the I·PARK2 contractor shall also be required to obtain a licence under the WPCO before commencement of any discharge subject to control of the WPCO and comply with the terms and conditions in the licence including the monitoring requirements. Hence, adverse hydrodynamics and water quality impacts arising from operation of the Project are not anticipated.

13.3.4 Waste Management Implications

13.3.4.1 Construction Phase

Construction and demolition (C&D) materials will be generated during the construction phase of the Project. Waste generated during construction works include inert C&D materials, non-inert C&D materials, chemical waste and general refuse. Approximately 501,830 m^3 of inert C&D materials would be generated of which 413,350 m^3 (82%) would be reused on-site and 88,480 m^3 (18%) would be delivered to designated Public Fill Reception Facility (PFRF). All pulverised fuel ash (PFA) excavated (approximately 148,850 m^3) would be reused for backfilling on-site so that no off-site disposal of PFA will be required in this Project. Approximately 79,410 m^3 of non-inert C&D materials would be generated of which 15,880 m^3 (20%) would be recycled and about 63,530 m^3 (80%) would be disposed of at designated landfill.

It is estimated that about 50 litres of chemical waste would be generated per month and collected by licensed chemical waste collector for disposal at licensed treatment facility i.e. Chemical Waste Treatment Centre at Tsing Yi. About 650 kg of general refuse would be generated per day. Recyclable materials recovered from the general refuse would be delivered to suitable waste recyclers and any non-recyclables of the general refuse would be disposed of at landfill.

Regular site inspections are recommended during construction phase to ensure the measures are implemented properly.

13.3.4.2 Operational Phase

During the operation phase of the Project, the major sources of MSW will be transported to the I·PARK2 via marine access. The MSW containing vessel will be equipped with GPS Trackers to provide real time vessel location, which serves as an effective surveillance measure to avoid waste dumping at sea. With reference to the prevailing practice of MSW transportation to landfills, the MSW will be fully enclosed in sealed containers or covered entirely to ensure that the MSW do not leak from vessels or vehicles during transportation. Regarding MSW handling in I·PARK2, when unloading MSW into the storage bunker and transferring it using overhead

crane grabs into the combustion chamber, the storage bunker will be kept at negative pressure to ensure no leakage of fugitive emission out of the storage bunker. The potential air quality and health impacts associated with MSW handling during Project operation is expected to be minimal.

In addition, incineration by-products including bottom ash, fly ash and air pollution control (APC) residues would be generated from the Project. It is estimated that approximately 660 to 1,200 tonnes per day (tpd) and 265 tpd of bottom ash would be generated from the Project operation and imported from I·PARK1, respectively for co-treatment. The bottom ash will be treated by screening, crushing, sieving and metal removal, etc. for metal recovery and off-site beneficial uses after meeting the relevant requirements[3]. Disposal of bottom ash at landfill would be the last resort if all possible options of the beneficial uses/outlet are exhausted.

On the other hand, it is estimated that approximately 200 to 400 tpd of fly ash / APC residues would be generated from the Project operation. As the existing technology for recovering fly ash is immature with a high cost, the fly ash / APC residues would be treated by cement solidification or chemical stabilization to ensure compliance with the incineration residue pollution control limits and the leachate parameters set out for landfills in Hong Kong prior to landfill disposal. The Government will keep in view the development of fly ash treatment technology and consider recovering fly ash for beneficial use when the technology becomes mature and cost-effective. The monitoring requirements for the bottom ash and stabilized fly ash / APC residues to be disposed of at landfill given in the EM&A Manual of this Project shall also be followed.

During the operational phase, toxicity characteristic leaching procedure (TCLP) tests for the bottom ash and stabilized fly ash / APC residues to be disposed of at landfill are recommended to ensure the compliance with the proposed Incineration Residue Pollution Control Limits (IRPCL). The proposed sampling frequencies are detailed in **Section 6.9**.

The treated bottom ash for off-site beneficial use would be tested in accordance with the relevant requirements subject to the possible options of beneficial uses/outlet of the treated bottom ash.

Apart from the above, dewatered sludge from on-site wastewater treatment plants, chemical waste and general refuse arising from operation of the Project will be properly handled, collected, treated and/or disposed of at appropriate treatment facilities.

[3] The treatment requirements will be subject to the possible options of beneficial uses/outlet of the treated bottom ash. Taking MSW incineration bottom ash treated for use as aggregate in Mainland China as an example, the relevant requirements in GB/T 25032-2010 "Municipal solid waste incineration bottom ash aggregate" should be met. More stringent treatment requirements might be required for other options of beneficial uses/outlet of the treated bottom ash.

13.3.4.3 Floating Refuse

Floating refuse may be trapped or accumulated along the artificial seawall during construction and operation of the Project. Considering no sharp turns or abrupt indentation for shoreline along the artificial seawall, entrapment or accumulation of floating refuse along the artificial seawall would be minimal. Floating refuse trapped within the Project area will be collected and properly treated or disposed of as general refuse. With the implementation of the recommended mitigation measures during the construction and operational phases of the Project, no adverse impact on waste management is anticipated.

13.3.5 Ecological Impact

13.3.5.1 Terrestrial Ecology

The proposed Project site comprises 24.2 hectares (ha) of wasteland, developed area and ash lagoon with limited ecological value. The impact in terms of direct habitat loss is considered as low. As low to moderate fauna diversity and abundance were recorded within the Project site and the fauna recorded within the Project site generally are highly mobile, direct impact to wildlife due to the Project is expected to be low. As a precautionary measure, site check by qualified ecologist(s) before commencement of the construction will be carried out to confirm there is no breeding activity of avifauna species of conservation importance within the Project site.

Indirect impacts would include noise and human disturbance, air pollutants and site runoff etc. during construction and operational phases. Good site practices and mitigation measures such as quieter construction methods, use of quiet equipment, control of construction site run-off, implementation of construction dust suppression measures / air pollution control measures as well as light and glare control measures are recommended to mitigate the potential disturbance impacts.

With proper implementation of the recommended good site practices and mitigation measures, no adverse terrestrial ecological impact due to the construction and operation of I·PARK2 would be expected.

13.3.5.2 Marine Ecology

The Project would cause a minor loss of marine habitat along the shore of Middle Ash Lagoon and West Ash Lagoon due to the seawall modification and new berthing facility. The affected area would be 4.4 hectares ha and 1.8 ha during construction and operational phases respectively. The ecological value of the affected habitat would be low. The loss of marine habitat caused by this Project is negligible.

Mitigation measures such as non-dredged ground treatment method (i.e. DCM) and deployment of silt curtain are recommended for the proposed marine construction works to

reduce potential impacts on the water quality which will, in turn, reduce impacts on marine ecological resources. Indirect water quality changes to marine life in terms of SS elevations and sedimentation rates arising from the proposed marine construction works are predicted to be insignificant. The predicted water quality changes are short term and localised to immediate vicinity of the works area. Full water quality compliances are predicted at all identified marine ecological sensitive receivers.

During the operational phase, the water quality effects due to the brine from desalination plant and seawater cooling effluent from seawater cooling system (if adopted) into the sea would also be localised in vicinity of the outfalls. Full water quality compliances are predicted at all identified marine ecological sensitive receivers during the Project operation. Neither marine species of conservation importance nor recognized sites of conservation importance are located at and near the Project area. The proposed seawater intakes of the Project will be located at the artificial seawall of I·PARK2 where marine ecological resources would be limited. No adverse impacts are expected from the impingement and entrainment of marine life in the proposed seawater intake systems of the Project.

13.3.6 Fisheries Impact

A literature review of fisheries baseline information in the assessment area has been undertaken. Results from the review indicate that the level of fisheries production of the Project area is low, whereas the level of fisheries operation of the Project area is moderate. Fisheries sensitive receivers identified in the assessment area include the oyster culture activities in Deep Bay, important spawning ground for commercial fisheries resources in North Lantau and artificial reefs in Sha Chau and Lung Kwu Chau Marine Park.

Loss of seabed fisheries habitat is predicted along the shore of middle and west ash lagoons due to the construction and operation of the seawall modification and new berthing facility for I·PARK2. The affected area would be very small of 4.4 ha and 1.8 ha during construction and operational phases respectively. The level of fisheries production at the affected habitat would also be low. The loss of fishing area caused by this Project is considered minor.

Mitigation measures such as non-dredge ground treatment method (i.e. DCM) and deployment of silt curtain are recommended for the proposed marine construction works to reduce potential impacts on the water quality which will, in turn, reduce impacts on fisheries resources. Indirect water quality changes to fisheries resources in terms of SS elevations and dissolved oxygen (DO) depletion from the proposed marine construction works are predicted to be insignificant. The predicted SS elevations and DO depletion are short term and localised to immediate vicinity of the works area. Full SS and DO compliances are predicted at all identified fisheries sensitive receivers.

During the operational phase, the water quality effects due to the brine from desalination plant and spent seawater cooling effluent from seawater cooling system (if adopted) into the sea

would also be localised in close vicinity of the outfalls. For the spent seawater cooling effluent discharge, alternative seawall outfall locations have been considered at West Ash Lagoon which are located further away from the oyster culture activities in Deep Bay with a view to reducing the potential water quality impact. Full water quality compliances are predicted at all identified fisheries sensitive receivers during the Project operation. Neither important nursery nor spawning ground is located at and near the Project area. The ichthyoplankton and fish larvae resources in the assessment area would be limited. No adverse fisheries impacts are expected from the impingement and entrainment of fish and crustacean larvae or eggs in the proposed seawater intake systems of the Project.

Under the existing situation, most of the MSW is delivered to the WENT Landfill via marine route. During the operational phase, MSW will be delivered to I·PARK2 using the same marine route. No new navigation channel for marine vessel is proposed under this Project. Maintenance dredging along the seafront of I·PARK2 is an existing operation. Any future maintenance dredging during the I·PARK2 operation would be similar to that carried out under the existing baseline scenario. No additional fisheries impact would arise from the maintenance dredging work of I·PARK2.

The waste / ash will be placed in containers that are sealed to prevent spillage of the contents during transportation. The containers shall be in good condition and free from damage or any other defects. Marine delivery of waste or ash would not cause any fisheries impact.

13.3.7 Visual Impact

The visual impact assessment shall focus on permanent visual impacts during operation of the Project. Representative public viewing points of the Project site include the sea travellers in the Deep Bay, visitors of T·Park and Tsang Tsui Columbarium and travellers along Nim Wan Road. With proper implementation of the proposed design and mitigation measures including aesthetic design of buildings, infill planting, tree planting along site boundary, green roof and vertical greening the overall visual impact will be ranging from negligible to moderate[4] The I·PARK2 contractor shall further develop the architectural and landscape design during detailed design stage, taking into account the proposed design and mitigation measures to reduce or moderate the visual effects and enhance the overall visual quality.

13.3.8 Health Impact

The health risks arising from construction and operation of I·PARK2 have been identified and the likelihood and consequences to aerial emissions and wastes and ashes that may contain toxic pollutants have been assessed. Inhalation is identified as the major route for aerial

[4] The impact is moderate if there will be some adverse visual effects caused by the Project, but these can be eliminated, reduced or moderated to a certain extent by design / mitigation measures.

emissions arising from operation of the Project while other indirect exposure pathways such as direct dermal contact are negligible. The predicted total carcinogenic risks at all representative health sensitive receivers (HSRs) due to inhalation do not exceed the target acceptable risk level of $1x10^{-5}$ as recommended in the USEPA risk management guidance. Assessment of the cumulative chronic and acute non-carcinogenic health impacts revealed that there would be no exceedance to the relevant local and international criteria due to inhalation. It is concluded that there would be no significant carcinogenic health risk or adverse chronic and acute non-carcinogenic health impacts arising from the aerial emissions of I·Park2.

On the other hand, waste and ash will be fully enclosed in sealed containers or covered entirely to prevent leakage from vessels or vehicles during transportation, while storage and handling of waste and ash will be carried out in an enclosed environment. For the PFA on-site, all PFA excavated would be reused for backfilling on-site and covered by at least 1m thick general fill so that no off-site disposal of PFA will be required in this Project. With proper implementation of the recommended good site practices, the potential health risks from radon emissions associated with PFA arising from the construction and operation of the Project will be minimal. The I·PARK2 contractor will be required to develop and implement a Project-specific emergency response / contingency plan to handle potential accidental events during construction and operation of the I·PARK2 Project with a view to minimising the health impacts associated with the potential accidental events.

13.3.9 Landfill Gas Hazards

The southeastern corner of I·PARK2 falls within the 250m consultation zone of the West New Territories Landfill Extension (WENTX) and therefore a qualitative landfill gas (LFG) hazard assessment has been conducted. Based on the assessment findings, the level of risk is low during construction phase and medium during operation phase. While LFG cut-off trench barrier will be built along the WENTX landfill site boundary under the WENTX project to prevent LFG migration to the Project site, the I·PARK2 contractor will be required to install monitoring wells within the Project site to monitor the LFG concentration. Moreover, LFG protection measures such as passive and/or semi-active control measures and detection systems will be incorporated in the buildings of the I·PARK2 Project. The future I·PARK2 contractor shall prepare a detailed qualitative risk assessment and submit the detailed design of the LFG protection measures to EPD for vetting pursuant to the requirements under the Landfill Gas Hazard Assessment Guidance Note during detailed design stage. With proper implementation of the recommended precautionary and protection measures, no adverse LFG hazard would be anticipated during the construction and operation of the Project.

13.4 Summary of Alternative Mitigation Measures

Alternative mitigation measures considered during the course of EIA study are summarized as follows.

- Different standards for pollution control on the MSW incineration including the standards from the Mainland China (GB 18485-2014) and Shenzhen (SZDB/Z 233-2017), the best available techniques (BAT) reference document for waste incineration in the European Union (EU), as well as the prevailing guidance note on the best practicable means (BPM) for incinerators (municipal waste incineration) in Hong Kong have been considered for deriving the target air emission levels for I·PARK2 during operational phase.

- Treatment of dewatered sludge within the incineration plant of I·PARK2 is preferred and selected over the option of treatment in T·PARK to minimize vehicular traffic air and noise emissions and avoid possible odour emissions during transportation of dewatered sludge during operational phase.

- Instead of the restricting the percussive piling work in non-sensitive hours to minimize the noise impact, non-percussive pilling method is the preferred option and will be adopted as far as practicable to minimize noise disturbances from the Project construction.

- Instead of the conventional method of using closed grab dredger to minimize loss of fines from sediment removal, non-dredged method is proposed for the marine construction of the Project to minimize impact on water quality, marine ecology and fisheries.

- Once-through seawater cooling system is one of the feasible options in the reference design of I·PARK2, which would generate seawater cooling effluent discharge. Alternative outfall options for mitigating the fisheries impact by diverting the Project effluent discharge away from the oyster rafts have been considered. The submarine outfall option is not recommended due to its conflict with existing utilities. Diverting the effluent discharge to the seawall of West Ash Lagoon is the preferred option to prevent adverse fisheries impact.