



世界自然基金會
香港分會

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Mrs. NG KIANG Mei Nei, Millie, JP and Mr. Fung Ho Yin, Owin, JP
Director of Environmental Protection
Environmental Protection Department

46/F, Revenue Tower,
5 Gloucester Road,
Wan Chai, Hong Kong
(Email: eiaopubliccomment2021@epd.gov.hk)

By Email only

Dear Mrs. Ng and Mr. Fung,

Re: Project Profile for:
1. Reclamation for Kau Yi Chau Artificial Islands;
2. Kau Yi Chau Artificial Islands Development; and
3. Hong Kong Island - Northeast Lantau Link
(ESB 349/2021, ESB 350/2021 and ESB 351/2021)

WWF would like to lodge our serious concerns on the captioned project profiles, **and strongly recommend the profiles are withdrawn for revision by the project proponent**, to address the concerns described below. The unprecedented scale of the proposed works warrants planning and assessment to a higher standard than the minimal requirements of a routine application of the Environmental Impact Assessment Ordinance. Planning and assessment must include the context of cumulative impacts of other current and recent major developments, and require prior development of Marine Spatial Planning and a regional Strategic Environmental Assessment. We offer solutions and recommendations on how these challenges can be addressed in the final section of this letter.

Given the increased national and international awareness of the importance of biodiversity with COP15 in Kunming, and the national commitment to ecological civilisation, Hong Kong must take every possible measure to play its part.

together possible™

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Section 1: Lack of Robust Marine Spatial Planning (MSP) and Strategic Environment Assessment (SEA) as a foundation for the EIA process

The proposed reclamation site contains important marine biodiversity. Although poorly studied compared to eastern waters, studies show at least 14 species of octocoral and black coral (Oceanway Corporation, 2018), 28 species of hard coral (WWF, 2021) in east Lantau Island waters, including corals larger than 1m, which indicates long history. WWF has been closely monitoring the marine ecological status and conducted several underwater ecological surveys in that area. Our surveys in 2019 found locally rare marine species, such as the spotted seahorse (*Hippocampus kuda*), pipefish (*Trachyrhamphus* sp.) and sea pen (*Virgularia* sp.). Hydrophone studies at east Lantau have also shown daily records of finless porpoise (*Neophocaena phocaenoides*) (WWF, 2019). According to port surveys 2016/17 conducted by Agriculture, Fisheries and Conservation Department (AFCD), east Lantau waters host relatively high fishing operations and fisheries production.

The proposed work is the largest-ever reclamation project in Hong Kong. Reclamation would not only affect the proposed reclamation sites but would also cause permanent and irreversible impacts beyond the sites themselves, altering and degrading the natural environment of Hong Kong, in a manner that is both unnecessary and expensive. Such construction will not only have direct financial costs of construction, but also immeasurable environmental cost due to increased carbon footprint and loss of biodiversity and ecosystem services. Given the scale of the projects, there is a need for prior rational, standardised planning processes to balance and integrate conservation and development use of marine space and resources; such integrations is fundamental for ecological civilisation. To achieve this, robust *Marine Spatial Planning (MSP) and Strategic Environment Assessment (SEA)* are required as context for the initiation of any EIA process: that is, the EIA process requires prior completion of MSP and SEA.

Lack of overall, integrated spatial planning for use of marine areas

At the moment, there is no overall strategic planning on the utilization of the sea in Hong Kong, leading to increasing conflict between marine users, conflicts between conservation priorities and development and overall lack of efficiency. MSP is a standardised, comprehensive, strategic, consultative and transparent process to analyse and allocate the use of sea areas to minimise conflicts between human activities and maximise benefits, while ensuring the resilience of marine ecosystems and the ecosystem services they provide (UNESCO-IOC/ European Commission, 2021). Just as the government is committed to proper land planning, it should immediately implement an ecosystem-based MSP for proper usage of our sea. Such MSP will then provide critical context and foundational principles for any EIA process for the reclamation proposals.

Lack of updated and robust SEA to evaluate land supply options and nature-based solution

SEA is a formalized, systematic and comprehensive process for evaluating proposed plans and alternatives during the early stage of decision-making process. In order to identify the most sustainable option consistent with the public interest, SEA should critically evaluate: the necessity of the project; all possible potential land supply options, including options other than reclamation; early warning of various

environmental impacts, along with feasible mitigation measures; and public opinions. In particular, SEA should apply the concept of the “Mitigation hierarchy”, in which avoidance and alternatives are given critical priority over offsets and such measures. Although the “Strategic Environmental Assessment for Hong Kong 2030+” report has been undertaken as part of the 2030+ study, it has never been publicly disclosed, making it impossible to assess the rationale for land reclamation.

Section 2: The project profiles fail to adequately incorporate all relevant environmental impacts or risks

1. *Cumulative and residual impacts on marine wildlife are not comprehensively scoped, and were have previously often underestimated.*

Assessing impacts separately for the 3 phases of the project (i.e. i. reclamation of Kau Yi Chau Artificial Island (KYCAI), ii. the development of the island, and iii. Hong Kong Island – Northeast Lantau Link (HKI-NEL) will necessarily underestimate the overall, cumulative impacts of the combined project. Similarly, the project profiles neglect consideration of the cumulative impacts with other development plans proposed under the Lantau Tomorrow Vision, including the proposed Lung Kwu Tan Reclamation, and the Re-planning of Tuen Mun West Area. Thirdly, the project profiles also fail to address the real risks of excessive environmental impacts arising from project delays. In the absence of a concrete project timetable for the proposed Lung Kwu Tan Reclamation and the Re-planning of Tuen Mun West Area (with 220 to 250 ha of proposed reclamation area estimated), we are gravely concerned that the construction phase of the proposed Lung Kwu Tan project will overlap with the reclamation of KYCAI, KYCAI development and/or HKI-NEL.

Serious environmental impacts have previously been documented in such situations. For example, the construction of the Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities (HKBCF) and Tuen Mun – Chek Lap Kok Link (TMCLKL) projects were both delayed, causing overlap with the HKIA Third Runway reclamation works, so that the cumulative disturbance to the marine environment was prolonged and exacerbated. Similarly, according to the EIA reports for the projects Hong Kong – Zhuhai – Macao Bridge (HKLR), HKBCF and TMCLKL, the Brothers Marine Park (BMP) was designated in 2016 to compensate for the irreversible and permanent loss of marine habitat for Chinese white dolphins arising from all three works. It was estimated in the EIA reports that cumulative and residual impacts of habitat loss on dolphins could be effectively mitigated by marine park designation. However, the annual monitoring of marine mammals by AFCD, in BMP and a broader marine region of about 4,000ha north of Lantau, shows that the occurrence and densities of Chinese white dolphins have dropped to very low levels, with no sign of recovery since 2015 (AFCD, 2021) or since completion of construction on the three projects. Thus the cumulative impacts of the three projects have not been effectively assessed; nor have residual impacts been mitigated.

Under the Technical Memorandum on EIA process, there is no clear guideline to address cumulative and residual issue. We urge strong enhancement to the project profile(s) to explicitly and comprehensively assess cumulative and residual impacts on marine wildlife to avoid a repeat of previous losses of our iconic marine wildlife.

Failure to assess ex-situ environmental impacts of filling material sourcing or overall project carbon emissions

The current project profiles do not include assessment of the impacts of sourcing the filling material, nor overall carbon emissions of this project. Obtaining suitable filling material will itself have significant, direct environmental impacts, whatever the source. Dredged sand material from remote sites necessarily causes serious disruption of the ecology at the source site. For example, illegal extraction of marine sand in Penghu, off eastern Taiwan has caused the destruction of squid and fish spawning grounds and habitat for critically endangered Chinese white dolphins *Sousa chinensis taiwanensis*. The use of mechanical sand requires large amounts of washing water, causing water pollution at source sites; fine particles in mechanical sand are difficult to settle and will remain suspended in the water column at the reclamation site, damaging water quality (as discussed in previous Legislative Council meetings).

There is currently a lack of local guidelines regarding the use of recycled aggregates for reclamation, and quality standards of fill materials and sorting of construction waste for production of fill materials differ significantly within and outside Hong Kong, so that the use of lower quality recycled aggregates risks long-term leakage of pollutants and/or toxins from aggregates - long after construction. Globally, the sand industry is very fragmented and unstructured (UNEP, 2019), while Hong Kong lacks local regulation (e.g. issue of permit) or guidelines for the import of sand materials other than marine sand in Hong Kong. Taken together, this will make it very difficult to trace the environmental sustainability of aggregate materials obtained, and carries serious risks that environmental destruction at source sites will be largely under-assessed, unreported, or even illegal where regulated.

Carbon emissions induced in both the construction and operational phases of the artificial island and related development, including the production, transportation and import of filling materials, are expected to be huge. This puts the works at odds with Hong Kong's commitment to a carbon neutral target, as outlined in Hong Kong's Climate Action Plan 2050+. In view of the insufficient local supply of fill, whether from recycled aggregates or mechanical sand, transport, processing and import of these fill materials from and over long distances are required, which in turn greatly increases the carbon footprint of the sourcing process. In particular, crushing of rock or other materials to make mechanical sand is necessarily extremely energy intensive, with consequent carbon costs.

If carbon emission related to proposed work is not properly assessed, avoided and mitigated, this will undermine Hong Kong's role in the national and global efforts in to combat climate change and limit global warming to 1.5° Celsius. The Technical Memorandum of EIA processes, not updated since the 1990s, do not currently include carbon performance. This needs rectification to support current policy on carbon neutrality locally and nationally; specifically, lack of assessment in these profiles will seriously undermine those policies.

The existing project profiles do not include these two important aspects, and thus will significantly underestimate *ex-situ* impacts arising from the proposed works. We urge the project proponent to withdraw the project profiles for further enhancement to address *ex-situ* impacts and carbon emissions.

Section 3: Recommendations for more comprehensive and adequate project profiles.

Robust SEA and MSP be conducted before the initiation of any EIA process

1. A robust regional SEA, which incorporates wide public and expert consultation, and is publicly available, is required. The existing “Strategic Environmental Assessment for Hong Kong 2030+” report must be publicly disclosed with proper consultations.
2. To initiate an eco-system based MSP in Hong Kong, a multi-institutional steering committee should be formed immediately, to coordinate the initiation of MSP, including identification of legal frameworks to develop MSP and its vision, goals and objectives. Participation should include key stakeholders including officials from relevant government bureaus (e.g. environment bureau, development bureau), academics and environmental NGOs, and industry sectors.

If the outcome of the SEA and MSP processes, with their extensive public and expert consultation, is to proceed with the project proposals, then the profiles can be resubmitted, with expanded scope to assess the following issues:

Cumulative impact assessment

1. The three project profiles (i.e. Reclamation for Kau Yi Chau Artificial Islands, Kau Yi Chau Artificial Islands Development and Hong Kong Island-Northeast Lantau Link) must be combined as one single project profile, in order to ensure the cumulative impacts arising from the three closely linked projects can be accessed comprehensively.
2. Cumulative impact assessment should take into consideration all previous, committed and planned coastal developments in the vicinity of the study area, including the transport infrastructure and explicitly including possible delays for projects. Relevant projects include but are not limited to proposed reclamation at Lung Kwu Tan and Siu Ho Wan, and the Integrated Waste Management Facilities at Shek Kwu Chau.
3. Cumulative impact on fisheries from all coastal development in Hong Kong, past, planned and committed should be assessed, to ensure the cumulative impact on hydrodynamics, fisheries resources and replenishment, fishing industry and livelihood of fishermen are evaluated. Assessments should include both desktop review and modelling studies and interviews with fishermen.
4. Ex-situ environmental impacts, especially the impacts of fill material supply, must be included in the profiles.

Baseline Monitoring and Impact Assessment for Marine Mammals

Ecological monitoring of local cetacean species of conservation interest should be designed to obtain a temporally and spatially comprehensive baseline profile and subsequent impact assessment. Key considerations include:

1. Passive acoustic monitoring should be conducted for a minimum period of 24 months to identify detailed shifts in seasonal and diurnal activity of resident cetaceans. In particular, Indo-Pacific finless porpoises (*Neophocaena phocaenoides*) are known to occur seasonally within the proposed reclamation area, but the group number is small, making them challenging to observe visually. In addition, visual monitoring alone is not sufficient, as the porpoises exhibit higher levels of activity at night within the proposed reclamation area (WWF-Hong Kong, 2019, unpublished report). It is also noted that there have been distinct shifts in both porpoise and dolphin habitat use (AFCD, 2021; WWF-Hong Kong, 2021, unpublished data) due to temporary cessation of transboundary ferries due to covid-related travel restrictions. Therefore, studies must encompass additional time to account for any significant changes in anthropogenic activities, particularly following the resumption of ferry traffic operation. Control sites should also be established throughout Hong Kong waters to evaluate and compare habitat importance for resident cetaceans, particularly finless porpoises.
2. Vessel-based line transect surveys, involving both visual and acoustic monitoring and covering a minimum consecutive period of 24 months (including both peak and off-peak porpoise seasons) should be carried out to map shifts in seasonal, daily and diel distribution of marine mammals. Ideally, surveys should be conducted four times monthly to effectively capture seasonal changes.
3. Helicopter survey of all known marine mammal habitats in Hong Kong should be conducted to accurately estimate the abundance of finless porpoises in Hong Kong waters, and the proposed works area in particular. Such aerial surveys should include 8 to 10 days of aerial line-transect, specifically targeting monitoring finless porpoise during their peak season (May to December). This would allow the calculation of the absolute abundance of the population in Hong Kong with a high degree of certainty, against which the currently high mortality could be better assessed, and population status could be established.
4. Risk of cetacean-vessel collision should be modelled and derived from patterns of marine mammal density and estimated vessel traffic in construction and operational phases (i.e. co-occurrence of marine mammals and vessel traffic ; Redfern et al., 2013). The risk models should be developed as part of the MSP procedures for managing multiple uses of the marine environment. This allows the identification of high-risk area(s) and quantification of ship strike risk for accurate impact assessment.
5. Propagation of noise disturbance during construction and operational phases should be modelled (Farcas et al., 2016; Faulkner et al., 2018) to quantify the impact of underwater noise to cetaceans and, thereby, predict the severity of actual impacts from manmade noise (Southall et al., 2007). Modelling results would allow effective mitigation of predicted zones of severe influence (for example, resulting in significant acoustic masking, hearing loss, injury, or even death) and acoustic disturbance.

Baseline monitoring for coral communities

1. Comprehensive coral baseline surveys, with at least 25 stations at east Lantau, is recommended to fully understand the coral community at the vicinity of the proposed reclamation area, with quantitative survey methods, including underwater video transect method to provide highly precise quantitative estimate of coral cover and abundance of benthic taxa. Although visibility in western waters is often poor, experienced survey teams have demonstrated that video transect is feasible in this area during periods of good visibility.

Hydraulic assessment and modelling study

The scale of reclamation will significantly change the hydrodynamics of the surrounding marine area, in turn affecting sediment dispersion and water quality/pollution over potentially large scales, with consequent impacts on marine habitats, biodiversity and fishery resources. These impacts require comprehensive study and modelling work at the scale of the whole Greater Bay Area. Given Hong Kong's intricate coastlines at the mouth of the Pearl River (Zhujiang), the hydrodynamics in the area are complex in time and 3-dimensional space, including significant seasonal change in currents (e.g. in terms of wave height and directions) at East and South-eastern Lantau. With Hong Kong's major sewage outfall not far to the north-east of the reclamation area, scientific studies have identified concerns about "dead zones" on the seafloor; such problems may be seriously exacerbated by changes in water flows (Qian et al., 2018).

1. Thus, modelling must be based on a minimum of one, year-round in-situ ADCP data collection. A short snapshot collection of in-situ data (e.g., 1-3 months) will generate modelling with greatly limited reliability, and likely will underestimate the impact to the whole marine ecosystem. Modelling should include water depths, and be at sufficient scales of time and space that, for example, sediment plumes are not dismissed because they disperse out of the modelled area. Potential impacts should include both physical and chemical hydrodynamics (water movement, sedimentation and transport, water quality/chemistry) and the potential impacts of those changes on biodiversity, fisheries, etc.
2. Further, these impacts should be assessed in concert with the possible impacts of climate change and the cumulative impacts from any previous and planned reclamation projects in the area.

Carbon emissions and climate resilience

1. Detailed calculation of the carbon emissions of the project, including both construction and operational phases, ex-situ and on-site, and the transportation, production and import of filling materials, must be covered in the EIA. The project proponent must illustrate clearly how carbon neutrality can be cost-effectively achieved, in all three proposed projects, and during construction and operation phases, and without undue reliance on offsets, to align with the

commitments of the Hong Kong government in achieving carbon neutrality target to combat climate change.

2. The infrastructure designs for climate resilience must be showcased to withstand the increasing risk from extreme weather events, sea level rises and other effects of a changing climate. Potential risks to the residents on the artificial islands under extreme weather, e.g., flooding and super typhoons should be assessed. To address the synergistic effects of increased extreme weather and sea level rise, infrastructure designs should go beyond the normal standard to withstand one in 200-year extreme weather event.

WWF remains committed to working in partnership with your department and the Hong Kong SAR government to achieve the best possible outcomes for Hong Kong's people and nature.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'L McCook', with a long horizontal flourish extending to the right.

Prof Laurence McCook

Director, Oceans Conservation

WWF-Hong Kong

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