Supplementary Information from AAHK on 3RS EIA Report to ACE EIASC Secretariat
On Chinese White Dolphins, Fisheries, Air Quality, Noise, Health Impact and Methodology

	Request	Supplementary Information	Relevant Sections in EIA Report
(A)	**Chinese white dolphins and the proposed marine park** ➢ **Based on the results of all the photo-identification studies in Hong Kong, would the project proponent provide the information below:**	Please note that the marine mammal impact assessment presented in 3RS EIA Chapter 13 was prepared based on a thorough literature review of all available information available at the time of EIA preparation; this included the AFCD long-term monitoring dataset (including the photo-identification component), AFCD's stranding data records and AFCD reporting in relation to AFCD's long term CWD monitoring programme. The literature review identified an information gap in waters within the HKIAAA marine exclusion zone and to fill the gaps focussed surveys over a 12-14 month survey period were undertaken using a combination of various types of monitoring effort.	
1.	The number of CWD individuals ever recorded in HK since such studies were started in mid 1990s?	Datasets from the almost 20 years of AFCD monitoring effort have been considered in the 3RS EIA assessments. The 2012/13 AFCD report provides the number of identified individuals as 829. Although the 2013/14 AFCD report was not completed at the time of the 3RS EIA assessment, the report updated the number of identified individuals to 841.	Appendix 13.2
2.	How many of these identified individuals were recorded only occasionally in HK in these studies and are	The EIA has acknowledged that CWDs move within individual home ranges varying in size from 3,900 Ha up to 33,900 Ha. Home ranges typically extend across several different areas within HK waters (e.g. the WL area / SCLKC area / etc.) as well as into waters in the Mainland parts of the PRE. The current understanding of the parts of the range of dolphins that occur outside of HK is highly biased by the large	Appendix 13.12

Request	Supplementary Information	Relevant Sections in EIA Report
regarded as visitors?	mismatch in data available from mainland waters compared to the robust dataset available in HK. Although a reliable analysis of current population trends in the Mainland parts of the PRE is not available, available information does support that a significant population exists in PRE waters and that dolphins regularly pass in and out of HK waters in the normal course of moving around their home range. Thus, while some identified CWDs are known to have a larger home range within Hong Kong than others, the extent that they use Mainland PRE cannot be ascertained. In AFCD's 2014 report (Hung 2014), 150 individuals are classified into different categories depending on the number of sightings. Individuals are recognised by Hung as seasonal residents, year-round residents, seasonal visitors, or not determined. As identified above, this assessment will be subject to the bias from the very strong mismatch of data available from Hong kong and the mainland PRE. So, although proportions of these can be calculated (e.g. from the Hong Kong database), this could give a skewed picture because of the data availability mismatch and therefore has not been attempted in the EIA.	
3. How many of these identified individuals were recorded regularly in HK and are regarded as residents?	See above.	
4. How many of these identified individuals were recorded seasonally in Hong Kong and are regarded as seasonal migrants?	See above.	

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5. Of the 54 individuals recorded in the EIA study at the study site, what were the numbers with respect to 1-4 above?	Please refer to the discussion on this issue on pp. 13-32 to 13-34 of the EIA. Such classification of individual dolphins could give a skewed picture because of the data availability mismatch (Hong Kong and PRE) such a distinction has not been attempted in the work done in this EIA. However, what we have been able to look at, for the purposes of providing extra information for ACE members, is to compare the photo identification records from the 3RS EIA surveys in the Airport North area with those from the equivalent AFCD supported monitoring effort. Using the information from the AFCD long term monitoring, the number of individual CWDs photo-identified from the vessel based surveys covering the SWL, WL, NEL, NWL and DB over the same survey period as 3RS EIA vessel survey (i.e. 11 Oct 2012 to 27 Nov 2013) were extracted. The AFCD data identifies that the number of individuals recorded in the overlapping survey period from AFCD's 2012/2013 data is 81 individuals and from the overlapping survey period from AFCD's 2013/2014 data is 70 individuals – i.e. a total of 151 individuals were identified from the AFCD survey effort over the same survey period as the 3RS EIA across all survey areas in Hong Kong waters. Thus, it is reasonable to extrapolate that 32 out of the total of 151 dolphins identified in Hong Kong waters in the period of the 3RS EIA assessment used the airport North survey area. This represents 21% of the total number photo-identified in the AFCD work over an equivalent time-period. However, it should be noted that this information does not quantify how identified CWDs are using the area, which is a key consideration.	Sections 13.4.6.61 – 13.4.6.66

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	After a review of the AFCD data-sets and the 3RS focused survey data sets the following points are supported: • Between 20-50% (depending on the analysis method used) of HK dolphins use the 3RS footprint area as part of their home range. • Essentially all of these dolphins use the area as a small part of their range (<20-25%) and most use it as less than 10% of their range. • They use the area mainly for traveling among 'critical habitat' areas around the Brothers, SCLKC, and West Lantau, but also do some feeding and other activities there. • The 3RS area does not appear to be critical habitat itself, by any of the standard definitions that have been used to define critical habitat for dolphins in HK. This further information does not alter the findings in the EIA that CWDs that use the airport north area are likely to be displaced as 3RS land formation progresses. It is expected that they will shift their activities (to temporarily avoid the areas in and near active 3RS construction areas) into other parts of their individual home-ranges and that they would also shift their east-west movements further north during the construction stage and after construction is completed in the time when a rebound in CWD numbers would be expected.	
6. With all the photo-identification work, a large dataset is available. The photo-identification of	We have considered all available information in the course of this EIA, and an information gap was identified for the areas near to the HKIA - this filled via 12 – 14 months of focused CWD monitoring effort. A full assessment of CWD abundance and population dynamics is provided in the AFCD reports and those assessments make use of individual CWD photo identification efforts for certain analysis. As these AFCD	Sections 13.4.6.49 – 13.4.6.114, Appendices

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individual data is capture and re-capture data. With this data, the population dynamics of the CWDs in Hong Kong between mid 1990s and now could be worked out. Why wasn't this done in the EIA? Could the project proponent do this now and show us the results?	reports were referred to and informed the 3RS EIA assessments, there has not been any need for further effort to work out additional information using the same AFCD datasets as part of the 3RS EIA work effort. AFCD data and reports from the mid 1990's to the present provide a very robust data set and overall give us a good understanding of CWD abundance over time in Hong Kong waters. This information, combined with findings from the 3RS survey efforts have facilitated the thorough impact assessment effort as is reported in the 3RS EIA. As identified in response to question A2 above, it is well recognized that there is a paucity of similarly reliable scientific information on CWD abundance in PRE waters. However, we have used the good information on the abundance and density of dolphins in Hong Kong waters from line transect methods, and this provides very up to date, complete and relevant information on CWD density/abundance in Hong Kong. Such information has informed the assessments in the 3RS EIA.	13.7 – 13.12
➢ **Based on the EIA and EM&A studies of the HKZMB, would the project proponent provide the following information:**		
1. How many identified individuals were recorded in and around the waters of the Brothers Islands?	The focused datasets obtained in the 3RS CWD survey work do not extend to waters around the Brothers. However, the 3RS EIA has referenced the datasets from the long-term AFCD monitoring effort and such information has informed the 3RS EIA. It is noted that AFCD datasets capture changes in abundance over time in Hong Kong waters including around the Brothers Islands and useful assessments on such aspects are provided in the AFCD reports. Because only the 2012/13 AFCD report was available at the time of the 3RS	

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		EIA work the 2012/13 report is the most recent AFCD report referenced in the EIA work.	
2.	Of these identified individuals in the Brothers Islands waters, how many are visitors; residents and seasonal migrants in HK?	A full assessment of CWD abundance and population dynamics is provided in the AFCD reports and those assessments make full and appropriate use of individual CWD photo identification efforts. As these AFCD reports were referred to and informed the 3RS EIA assessments, there has not been any need for further effort to work out further information using the same AFCD datasets as part of the 3RS EIA work effort.	
3.	After the start of the construction work of the HKZMB, how many of these identified dolphins were driven away from the Brothers Islands? Where have they gone?	The AFCD datasets and analysis captures changes in abundance and use around the Brothers effectively, including detailed assessment of the range use shift of individuals from the Brothers Islands in recent years. Because only the 2012/13 AFCD report was available at the time of the 3RS EIA work the 2012/13 report is the most recent AFCD report referenced in the EIA work. For additional information to ACE members, please note that the 2014 AFCD report included further analysis on the range shift of individual dolphins in relation to HZMB projects. This information can be referenced on pages 57-59 and Figures 48 – 49 of the AFCD report) http://www.afcd.gov.hk/english/conservation/con_mar/con_mar_chi/con_mar_chi_chi/con_mar_chi_chi.html The figure from Samuel Hung's report showing the increasing trend in SCLKCMP and decreasing trend in planned BMP – i.e. trends and changes over time - have already been captured in the AFCD work and have informed our own EIA assessments.	

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4.	Following on from No. 3 above, are these dolphins displaced from the Brothers Islands causing any impacts on those dolphins in their new home?	As stated above, the EIA has acknowledged that CWDs move within individual home ranges varying in size from 3,900 Ha up to 33,900 Ha. Home ranges typically extend across several different areas within HK waters (e.g. the WL area / SCLKC area / etc.) as well as into waters in the Mainland parts of the PRE. The current understanding of the parts of the range of dolphins that occur outside of HK is highly biased by the large mismatch in data available from mainland waters compared to the robust dataset available in HK, however, available information does support that a significant population exists in PRE waters and that dolphins regularly pass in and out of HK waters in the normal course of moving around their home range. It is expected that dolphins displaced from a preferred part of their home range around the Brothers (which has previously been considered a critical habitat area for HK dolphins) would likely cause some impact in the parts of their home-range that they might be using more. Impacts may be positive or negative. As there is no evidence that dolphins in Hong Kong are under any sort of food stress, higher uses of the other parts of home-ranges would not for example be expected to have a detrimental effect in terms of increased competition for limited food resources. As mentioned, the current understanding of the parts of the range of dolphins that occur outside of HK is highly biased by the large mismatch in data available from mainland waters compared to the robust dataset available in HK, so limited reliable information is available on impacts in the parts of individual home ranges that extend into Mainland PRE waters.	

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➢	**Would the project proponent please provide the following information of the CWDs in SCLKC Marine Park?**		
1.	How many identified individuals by photo-identification have ever been recorded in the SCLKC Marine Park?	The effectiveness of the SCLKCMP has been discussed in EIA section 13.11.5.26 and in Hoyt (2011, p. 342)[1], which is referenced in Appendix 13.15 of the EIA report. The SCLKCMP consistently has some of the highest densities of dolphins in HK. Details are in Hung (2008)[2] and AFCD's Marine Mammals Monitoring Reports (e.d Hung, 2014) identify that dolphin habitat use patterns between 2009-13 and 2004-08 were largely similar, with the most important dolphin habitats identified being the area around Lung Kwu Chau and along the west coast of Lantau. By all accounts the SCLKCMP has been very effective in assisting dolphin conservation in HK, despite that fact that it was criticised in the early years for being too small, not covering the right areas, and coming too late to help dolphins. Long-term monitoring shows that the SCLKCMP consistently has some of the highest densities of dolphins in HK This information on photo-identification is contained in the current AFCD photo-ID dataset and therefore the	

[1] Hoyt, E. (2011). Marine Protected Areas for Whales, Dolphins and Porpoises, Second Edition. Earthscan.

[2] Hung, S. K. Y. (2008). Habitat use of Indo-Pacific humpback dolphins (Sousa chinensis) in Hong Kong. Doctoral dissertation, University of Hong Kong, pp. 253.

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		3RS EIA has considered the broad changes over time in CWD use of waters around the SCLKC area. Such information is constantly being updated by AFCD's contractor, HKDCS as part of the ongoing AFCD monitoring effort. The EIA has taken full cognizance of AFCD data-sets and reporting.	
2.	How many of these identified individuals are regarded as residents of or dependent on SCLKC Marine Park?	A full assessment of CWD abundance and population dynamics is provided in the AFCD reports and those assessments make full and appropriate use of individual CWD photo identification efforts. As these AFCD reports were referred to and informed the 3RS EIA assessments, there has not been any need for further effort to work out further information using the same AFCD datasets as part of the 3RS EIA work effort. As mentioned previously, the EIA recognizes that home ranges typically extend across several different areas within HK waters (e.g. the WL area / SCLKC area / etc.) as well as into waters in the Mainland parts of the PRE. In AFCD's 2014 report (Hung 2014), 150 individuals are classified into different categories depending on number of sightings. Individuals are recognised by Hung as seasonal residents, year-round residents, seasonal visitors, or not determined. As identified above, this assessment will be subject to the bias from the very strong mismatch of data available from Hong kong and the mainland PRE. So, although proportions of these can be calculated (e.g. from the Hong Kong database), this could give a skewed picture because of the data availability mismatch and therefore has not been attempted in the EIA.	
3.	Since photo-identification study data is available, what is the trend of the number of individual residents of	As stated and presented elsewhere, the trend in the SCLKC MP is increasing (see Hung 2014). Please refer to the answer to question 1 in this section of responses.	

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	CWD in SCLKC Marine Park?		
➢	**Any alternative in designating the proposed marine park in phases before commencement of works and/or during the construction phase of the project; would marine reserves give a much stronger protection to the CWDs impacted by the proposed 3Rs project than marine parks; detailed explanation on why these alternatives were not adopted in the EIA report**	On the question of Marine Reserves versus Marine Parks and respective "value' of either designation in terms of conservation and protection for CWDs, the EIA has recommended designation of the large area of new Marine Park as the most appropriate option. Our understanding of additional restrictions applicable to marine reserves rather than marine parks is that within marine reserves there is a complete prohibition of boating (i.e. no person shall within a marine reserve fish, swim, dive or carry out any boating [CAP 476A, Section 3 and 6]) As there are many stakeholders involved when designating a marine park or a marine reserve, it is expected that the increased restrictions of a marine reserve as identified would likely result in even greater objections to a marine reserve proposal for such a large area among other user groups, and could indeed threaten or cause delays in the process of designation. As vessel traffic at a restricted speed is compatible with safe use of an area by CWDs and that we are not intending to preclude all vessels from this large area, the judgement is that a marine park designation is appropriate in this instance. A firm commitment in the EIA is the development of a Marine Park Management Plan prior to establishment of the Marine Park. The development plan will look to identify areas within the overall area of proposed marine park that may benefit from additional protection measures – as are prescribed and possible within the Marine Park Ordinance. The alternative of designating the proposed marine park in phases before commencement of works and/or	

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	during construction phase of the project was not adopted in the EIA report as we firmly believe that the mitigation measures already proposed in the report meet the requirements of EIAO and are appropriate and sufficient. Notwithstanding this, however, we shall continue to liaise with Government and, where appropriate, AA would cooperate fully with relevant Bureaux and Departments of the Hong Kong Government in relation to proposed CWD mitigation / compensation. AA will also set up a marine ecology and fisheries enhancement fund to support the measures.	
➢ **Practicality of designating another marine park/reserve at western/southwestern part of Lantau as an off-site compensation for construction impacts**	AA shall continue to liaise with Government and, where appropriate, AA would cooperate fully with relevant Bureaux and Departments of the Hong Kong Government in relation to proposed CWD mitigation / compensation. AA will also set up a marine ecology and fisheries enhancement fund to support the measures.	
➢ **Review on the speed limit of 15 knots currently proposed for the high speed ferries operated by Skypier; any discussion in reducing the traffic frequency and route**	The 3RS EIA report has projected and considered the likely future numbers of HSFs expected in North Lantau Waters and this is summarised in Table 1 below.	

<table>
<tr><th>Request</th><th>Supplementary Information</th><th>Relevant Sections in EIA Report</th></tr>
<tr><td>diversion of these HSFs from Urmston Road 龍鼓水道; information on vessels other than those operated by Skypier using that water channel in the north Lantau waters</td><td>
Table 1: Actual and Projected Daily HSFs navigating N. Lantau Waters
<table>
<tr><th></th><th>2011*</th><th>2021#</th><th>2030#</th></tr>
<tr><td>HSFs between Airport & Sha Chau</td><td></td><td></td><td></td></tr>
<tr><td>- SkyPier</td><td>34 (59%)</td><td>45 (60%)</td><td>50 (59%)</td></tr>
<tr><td>- Other</td><td>24 (41%)</td><td>30 (40%)</td><td>35 (41%)</td></tr>
<tr><td>HSFs using Urmston Road</td><td></td><td></td><td></td></tr>
<tr><td>- SkyPier</td><td>54 (50%)</td><td>70 (50%)</td><td>80 (50%)</td></tr>
<tr><td>- Other</td><td>54 (50%)</td><td>70 (50%)</td><td>80 (50%)</td></tr>
</table>
* Daily average movements identified from Marine Department AIS data
# Daily average movements projected in Marine Traffic Impact Assessment (BMT, 2012)

Non-SkyPier HSFs navigating North Lantau waters are those travelling between Hong Kong Macau Ferry Terminal (HKMFT) and Hong Kong China Ferry Terminal (HKCFT) and ports in the North, East and North West of the Pearl River Estuary. In addition, although the preferential route for HSFs travelling between Hong Kong and Macau / Zhuhai is south of Lantau, a small percentage of this traffic will utilize North Lantau waters (for example during inclement weather and/ or during high sea swells south of Lantau). By referring to ferry schedules (which can be accessed via the websites of the ferry operators) the 2011 estimate of 24 non-SkyPier vessels navigating between the airport and Sha Chau is around 8% of the total scheduled
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	sailings to and from Macau / Zhuhai (total daily sailings around 300). On the recommendation to limit diverted SkyPier HSFs to 15 knots, several studies of the effects of vessels on marine mammals have indicated a 'safe' speed of 10 knots or less, and also that as speeds increase from 10 knots, the risk of vessel collision also increases. The 15 knot speed is seen as a reasonable compromise between the desired 10 knots for dolphin conservation and what is attainable for high-speed ferries without for example having unacceptable impacts on passenger wellbeing. Note that currently, many HSFs travel through North Lantau (both north and south of the SCLKC MP) at 30-40 knots, and slowing to 15 knots is seen as a strong improvement for dolphin protection. AAHK again reiterates it has proposed an additional precautionary measure further to receiving feedback on this aspect during the public inspection period. The additional measure is to limit the number of HSFs operating to and from SkyPier to an annual daily average of 99.	
➢ **Review the speed limit of the Skypier high speed ferries inside the PRE CWD Nature Reserve in China.**	SkyPier HSFs must adhere to all relevant speed restrictions both in Hong Kong and in Mainland PRE waters. In the 3RS EIA we are required to focus on the situation and associated controls within Hong Kong waters. Nonetheless, the PRE CWD Nature Reserve in China layout is shown in the attached figure:	

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	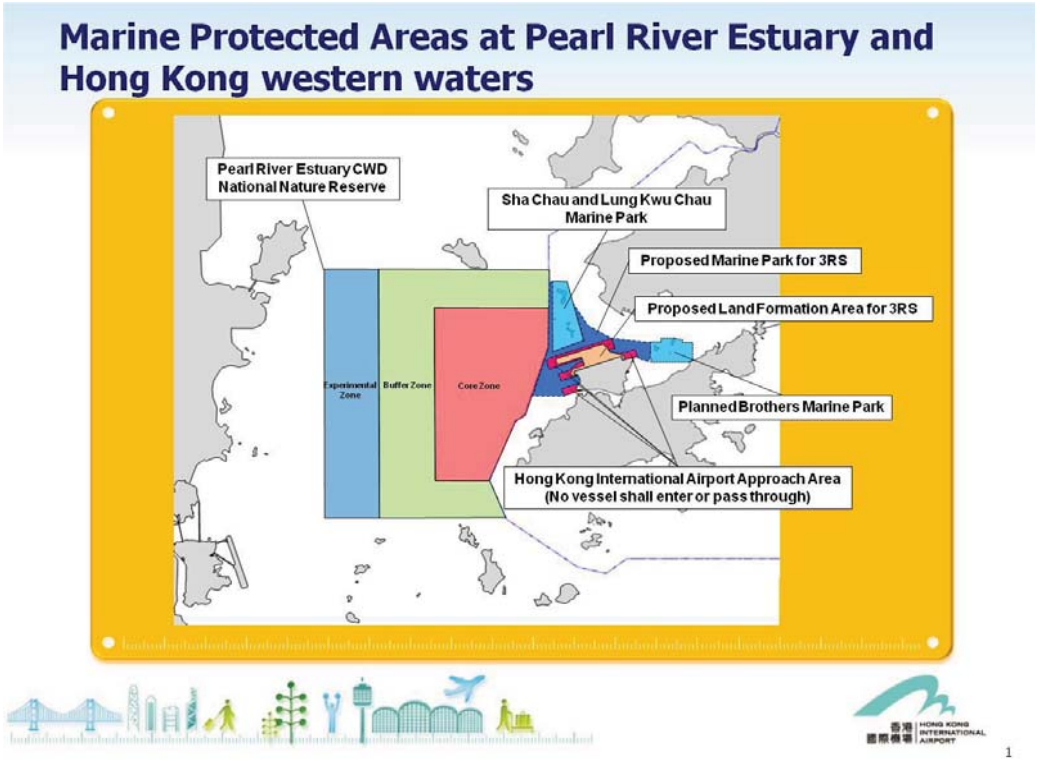 The current SkyPier HSF routing to and from Macau/Zhuhai takes HSFs through the middle of the core zone of the nature reserve. The diversion of such ferry traffic north of SCLKCMP will naturally have the effect of diverting a larger portion of such ferry traffic away from the core area.	

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➢ **Supporting evidence/commitment from relevant policy bureau/department on the designation of the proposed marine park; any fall-back or alternative on the "what if" scenario**	Given the significance of Marine Park establishment as a key mitigation measure, the successful establishment of the proposed Marine Park is of key importance. The Administration has made a firm commitment to seek to designate the proposed marine park of approximately 2,400 ha in the waters north of the 3RS project in accordance with the statutory process stipulated in the Marine Parks Ordinance, as a mitigation measure for the permanent habitat loss arising from the 3RS project. AAHK will seek to complete the designation tentatively around 2023 to tie in with the full operation of the 3RS. To supplement, as extracted from 2014 Policy Agenda, the HKIA will reach its full capacity in the next few years. There is an urgent need to construct a third runway to maintain our position as an aviation hub as well as our competitiveness. Planning work is being taken forward at full speed with a view to commissioning the third runway by 2023. And another relevant extract from 2014-15 Budget on Government's support for the project mentioned "The Government is assisting the Airport Authority Hong Kong (AA) to press ahead with planning for a three-runway system. The project, will foster our long-term economic development and enhance our competitiveness. The AA is conducting the environmental impact assessment with a view to securing approval this year in order to take forward the project as soon as possible for commissioning in 2023." Should the EIA report be approved, all mitigation measures as recommended in the EIA report including designation of the proposed marine park will become the statutory requirements of the project proponent under the EIA Ordinance. The AAHK proposes to commence preparatory work and the process of Marine	

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	Park establishment as early as possible, with the target to complete the designation of the proposed Marine Park tentatively around 2023 to tie in with the full operation of the 3RS. As part of this preparatory work effort, a thorough consultation of all directly and indirectly affected stakeholders shall be undertaken. A marine park management plan will also be submitted to Director of Environmental Protection (DEP) for approval before the commissioning of the 3RS project.	
➢ **Information on the performance of the PRE National Nature Reserve in respect of conservation of CWD identified in that part of water bodies**	The PRE CWD National Nature Reserve has a range of prescribed controls in place to protect CWDs. According to the regulations for natural reserves under the People's Republic of China, illegal fishing, reclamation and dredging as well as other activities causing damages or adverse impacts on the targeted resources are prohibited within the nature reserve, unless allowed by laws or other administrative regulations. Reference in Chinese only http://www.cwd.gov.cn/more.asp?id=463 (Section 26) http://www.cwd.gov.cn/more.asp?id=461 (Section 15) There is however no apparent control on high-speed ferries. AAHK is not privy to information on performance or success of conservation / effectiveness of related measures taken in the National Nature Reserve. In addition and as stated, there is poor understanding of abundance and population dynamics of the dolphins in Mainland PRE side, although the literature review in the EIA identifies the population to be around 2,500 individuals in total. Long term changes in abundance	

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	and aspects of population biology on the Mainland PRE are not available and therefore estimates of effectiveness of conservation measures are not possible.	
➢ **Information on the Marine Ecology Enhancement Strategy**	Section 13.13 of the EIA has provided the framework of the proposed Marine Ecology and Fisheries Enhancement Strategy (MEFES) for enhancing the marine ecological environment. This is in addition to the mitigation measures proposed in the EIA, and has the aim of contributing to enhancing marine ecology (including CWD) and fisheries resources in north Lantau waters. As presented in EIA Sections 13.13.2 to 13.13.4, the MEFES will be framed to cover the following key aspects: • **Enhancement of habitats for marine ecology and fishery resources** The enhancement measures would include but not limited to eco-enhancement designs of seawall for promoting re-colonisation of intertidal and sub-tidal fauna as well as recruitment of juvenile fishes; introduction of potential fisheries "no-take-zone/ enhancement areas" in the future extended HKIAAA with restricted vessel entry to help in betterment of marine fauna and fisheries resources; and deployment of artificial reefs to provide hard substrates for recolonisation of marine fauna if these can be shown to be beneficial to fisheries resources. Details of the enhancement measures will be established at the detailed design stage. • **Encouragement of scientific research and studies** In order to further the understanding of CWDs and marine environment, it is proposed to set up a Marine Research Programme in the northwestern part of Lantau, which could support and/or collaborate with academic institutes to conduct scientific researches and studies that aim to: - Provide long-term monitoring and/or in-depth understanding of the marine resources; and - Facilitate the development of practices, measures and/or programmes for enhancement of marine ecology resources.	Section 13.13

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	Examples of such researches and studies could include monitoring of CWDs in northwest Hong Kong waters / adjacent waters in Pearl River Estuary (PRE); modelling studies of CWD activities / fisheries resources to predict impacts of proposed marine infrastructure projects; monitoring of coral and benthic fauna at the future HKIAAAs and marine parks; study of the intertidal and estuarine habitats at north Lantau in which there are records of seagrass beds, horseshoe crabs, pipefishes and/or other species of ecological importance; investigation of the effectiveness of eco-enhancement seawall designs and/or artificial reefs; and ecological and fisheries resources study before and after the designation of marine park. • **Promotion of environmental education and eco-tourism** It is proposed to support initiatives that promote environmental education and eco-tourism initiatives relating to marine ecology and fisheries along the north Lantau coast and in northwest Lantau waters. Examples of such initiatives could include: - Establishment of eco-trails with displays introducing the conservation of terrestrial / marine ecology and fisheries resources of north Lantau and surrounding waters - Promotion of eco-tourism in the marine parks with environmentally friendly code of practice - Development of eco-tourism for the public to raise their awareness on sustainable fishing operations - Organisation of campaigns for cleaning of sandy shores at the SCLKCMP, San Tau Beach SSSI, etc. - Horseshoe crabs breeding and release programme at north Lantau soft shores - Education programme for providing a platform for local school groups and general public, to learn more about the local marine ecology as well as CWD ecology As given in Section 13.13.5 of the EIA, the above MEFES will be supported by an Environmental Enhancement Fund (EEF) to be set up by AAHK. However at this early stage in the development of the EEF and its potential initiatives, it	

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	is premature to discuss the exact funding amount and mechanisms for allocation of funds to proposed initiatives. The MEFES and associated management arrangements, funding amounts and fund allocation mechanisms will be established prior to commencement of the construction phase of the project. AAHK will continue to engage with a range of fisheries and other stakeholder groups so that their concerns and suggestions on fisheries and other potential marine ecological enhancement measures can be taken into consideration where appropriate during the formulation of the MEFES and then during MEFES implementation.	
(B) Fisheries and coral community		
➢ **Comparison of the economic loss over the loss of fisheries grounds with that used in the HZMB EIA project as the % loss cited by the latter was much higher; level of compensation for the fisheries groups being displaced**	Based on the fisheries impact assessment from the HZMB EIA, no specific % in economic loss over the loss of fisheries grounds has been cited. The HZMB EIA has cited that the temporary loss of maximally 301 ha of fishing ground for six years and permanent loss of 168 ha fishing ground after construction, which were estimated as respectively 0.2% and 0.1% of the 1,651 km^2 (or 165,100 ha) of Hong Kong's total marine waters (EPD 2005) available for fishing. For the 3RS EIA, the total (permanent plus temporary) loss of fishing ground during construction phase is approximately 1,392 ha whereas the permanent loss of fishing ground during the operation phase will amount to 768 ha (410 ha + 358 ha), representing respectively about 0.9% and 0.5% of the total Hong Kong marine waters of approximately 162,460 ha available for fishing (a more conservative size with the exclusion of marine reserve, principal fairway, typhoon shelter, etc. where fishing is not allowed). For the fisheries production loss, the reclamation area for the HKBCF is located mainly within Grid Cell of the area in	Sections 14.4, 14.7

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	Brothers Islands with relatively higher fisheries production (i.e. 200 – 400 kg/ ha/ year) in terms of weight, and values ranged from HK$1,000 – 10,000 /ha according to the Port Survey 2006 findings by AFCD. For 3RS project, the overall fisheries production in terms of weight within the 3RS formation footprint was moderately low (100 – 200 kg/ha/year) and in terms of value was moderately low to moderate (HK$1,000 – 5,000/ha). When compared to the overall capture fisheries production, the HKZMB EIA using an overall of about 158,000 tonnes production in 2008. For 3RS EIA, the overall production in 2013 in Hong Kong is about 170,129 tonnes (AFCD, 2014). Therefore, the proposed 3RS land formation and associated marine works of approximate 672 ha will affect approx. 0.04 – 0.08 % of overall capture fisheries production in Hong Kong.	
➢ **Mitigation measures for the loss of fisheries grounds during the construction phase**	As detailed in Section 14.9 of the EIA, the mitigation measures that could help alleviate the impacts due to loss of fishing grounds during construction phase include minimisation of land formation footprint from 827 ha to 650 ha; consideration of alternative alignments for submarine pipeline diversion to avoid/ minimise disturbance on the seabed; use of the construction methods that can avoid/ minimise impacts on marine environment (e.g. using non-dredge method for ground improvement works, adopting HDD for diversion of submarine fuel pipelines, locating cable field joint away from the existing SCLKCMP and avoiding affecting the existing cable laid under the seabed within the SCLKCMP); strict enforcement of no-dumping policy; good construction site practices; and measures to mitigate indirect disturbance on marine ecology and fisheries resources due to potential deterioration of water quality. Upon completion of the construction phase, the permanent loss of fishing ground and fisheries habitats (and resources) will be compensated by establishment of the proposed 2,400-ha marine park to connect with the existing SCLKCMP and the planned BMP. While fishing activities will be managed through a permit system within the proposed marine park, the potential fisheries resources recovery due to the enhanced protection measures to be applied for the proposed	Sections 14.9 and 14.11

Request	Supplementary Information	Relevant Sections in EIA Report
	marine park including speed restriction, restriction of anthropogenic disturbance, restriction of fishing in core areas and the synergistic effect of the connected marine protected areas with HKIAAA as fisheries no-take zone will benefit the adjacent fishing grounds by the spill over effect, thereby reducing the impact on loss of fishing grounds. A local study demonstrating the spill over effect after establishment of marine protected areas including the SCLKCMP has been reviewed in Section 14.9.1.22 of the EIA while overseas examples demonstrating the benefits of marine protected areas on fishermen operating in marine parks and adjacent areas are cited in Section 14.9.1.25 of the EIA. Given the significance of the proposed marine park establishment as a key mitigation measure, advance designation has been considered, however, it is not practicable to seek to designate the proposed marine park while construction activities for the 3RS project are ongoing. Therefore, on top of the proposed mitigation measures, AAHK also suggests that a Fisheries Enhancement Strategy (FES) with Fisheries Enhancement Fund should be initiated to support the sustainable development of the fisheries industry. Details of the framework for the FES are provided in Sections 14.11.1.4 – 14.11.1.10 of the EIA.	
➢ **Material mitigation measures to be adopted in conserving the rare species identified, e.g. longheaded eagle ray, long-tooth grouper and gorgonian coral species**	As assessed in Section 13.8.1.16 to 13.8.1.19, of the six fish species of conservation importance recorded during the fisheries survey, five species were found both within and outside the land formation footprint and one species was found only within the footprint. The density of the species of conservation importance within the footprint was not shown to be comparatively higher than other survey areas. Where they were recorded in the footprint by fisheries survey, the density was often low. Due to the high mobility of these marine fish species, small population to be affected (as demonstrated by their relatively low density within the footprint) and availability of suitable habitats in other areas such as the Brothers, SCLKCMP, north and west Chek Lap Kok waters, the impact of direct habitat loss of 650 ha of open marine water on these marine fauna and species of conservation importance is considered as moderate importance.	Sections 13.8, 13.11 and 14.9

Request	Supplementary Information	Relevant Sections in EIA Report
	As detailed in Section 13.11, the relevant mitigation measures for the loss of open marine waters during construction phase include minimisation of project footprint from 827 ha to 650 ha; consideration of alternative alignments for submarine pipeline diversion to avoid/ minimise disturbance on the seabed; use of the construction methods that can avoid/ minimise impacts on marine environment (e.g. using non-dredge method for ground improvement works, adopting HDD for diversion of submarine fuel pipelines, locating cable field joint away from the existing SCLKCMP and avoid affecting the existing cable laid under the seabed within the SCLKCMP); strict enforcement of no-dumping policy; good construction site practices; and measures to mitigate indirect disturbance on marine ecology and fisheries resources due to potential deterioration of water quality. Upon completion of the construction phase, the permanent loss of fishing ground and fisheries habitats (and resources) will be compensated by establishment of the proposed 2,400-ha marine park to connect with the existing SCLKCMP and the planned BMP. While fishing activities will be managed through a permit system within the proposed marine park, the potential fisheries resources recovery due to the enhanced protection measures to be applied for the proposed marine park including speed restriction, restriction of anthropogenic disturbance, restriction of fishing in core area and the synergic effect of the connected marine protected areas with HKIAAA as fisheries no-take zone will benefit the adjacent fishing ground by the spill over effect, thereby reducing the impact on loss of fishing ground. A local study demonstrating the spill over effect after establishment of marine protected areas including the SCLKCMP has been reviewed in Section 14.9.1.22 of the EIA while overseas examples demonstrating the benefits of marine protected areas on fishermen operating in marine parks and adjacent areas are cited in Section 14.9.1.25 of the EIA. As detailed in Section 13.8.1.2 to 13.8.1.5, the loss of hard bottom sub-tidal habitats, including the loss of low coverage of the coral species that are not in good conditions, is considered of low-moderate significance upon completion of construction. As detailed in Section 13.11.4, a pre-construction coral dive survey at the artificial	

Request	Supplementary Information	Relevant Sections in EIA Report
	seawalls on north and northeast sides of the existing airport island has been proposed, to check the status of the ahermatypic cup coral and other coral species that will be subject to direct impact and to review the feasibility of translocation. Considering the common distribution of the coral species in western Hong Kong waters and with the re-provision of 13-km artificial seawall of similar design and substrates (but longer than the 5.9-km existing seawall to be removed), the coral species is anticipated to recolonize at the sub-tidal zone along with time. With the extension of the HKIAAA as a marine exclusion zone, the re-established habitat will be protected from anthrogenic disturbance. The impact of loss of sub-tidal habitat is considered to be low during the operation phase, and no further mitigation measure is required.	
➢ **Any concrete measures in the proposed plan for the translocation of coral**	The preliminary methodology for pre-construction coral dive survey at the directly affected site and potential recipient site(s) has been proposed in Sections 10.2.2.2 – 10.2.2.12 of the EM&A Manual. A pre-construction coral dive survey plan and report will be prepared for agreement with the Authority prior to the commencement of survey. The aim of the survey is to identify any coral colonies suitable for translocation. A detailed pre-construction coral survey plan with potential recipient sites and translocation plan will be prepared prior to the commencement of construction. Determination of the potential for coral translocation will be based on the conservation importance of the coral species (including hard corals, soft corals and octocorals), the coral health conditions, size of the communities and feasibility for translocation (e.g. attached to large boulders but <50 cm in diameter and considered as manageable of translocation with minimal destruction of the coral communities).	Sections 10.2.2.2 – 10.2.2.12 of the EM&A Manual
➢ **Any mitigation measures for the loss of fisheries grounds during the**	Please see response to mitigation measures for the loss of fisheries grounds during the construction phase above. As detailed in Section 13.13.2, the proposed artificial reef deployment and eco-enhancement seawall design have been proposed as ones of the enhancement measures on top of the recommended mitigation measures. As the	Section 13.13, Section 14.11

Request	Supplementary Information	Relevant Sections in EIA Report
construction phase, e.g. artificial reef, eco-design of seawall, etc.; supporting evidence on the suitability and sustainability of these measures	enhancement measures are not part of the mitigation measures, the feasibility of enhancement measures will be subject to review at a later stage. As detailed in Section 13.13.3 of the EIA, one of the key aspects to be covered by the proposed Marine Ecology and Fisheries Enhancement Strategy (an enhancement measure) is encouragement of scientific research and studies, which could include studies on the effectiveness of eco-enhancement seawall design and/or artificial reefs. It has also proposed to formulate and implement a Fisheries Enhancement Strategy (FES) as detailed in Section 14.11 with the aim of providing support to: - Assist fishermen operating in the western Hong Kong waters in better coping with required changes to their fishing activities resulting from the proposed project; and - Enhance marine ecology and fisheries resources in western Hong Kong waters especially the Lantau waters. The principles of the FES shall be to: - Offer a range of practical efforts / measures that would be beneficial to fishermen / fishing communities affected by the project and the related mitigation measures; - Provide on-going effort and initiatives to enhance marine fisheries resources and related habitats and ecosystems; and - Promote sustainable fisheries operations. Making reference to feedback and suggestions obtained from the fisheries interview survey as well as from the various	

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	stakeholder engagement exercises organised by AAHK (including fishermen briefings), it is proposed that the FES should be framed under the following three key aspect areas: (a) ***Support and enhance on-going fisheries operations:*** For those fishermen that require to operate in alternative fishing grounds as a result of the construction and operation of the project, potential measures could include supporting fishermen in adapting their modes of fishing operation to suit different marine environments; assisting fishermen in improving their operation efficiency and/or achieving better environmental performance through purchasing new fishing equipment / upgrading fishing gear; strengthening fisheries resources by re-stocking / release of suitable fish fry; and monitoring of fisheries resources at appropriate locations (e.g., within HKIAAA, Marine Parks). (b) ***Support measures that assist in shifting fisheries operations:*** Some fishermen may consider shifting their modes of fishing operation in view of the project and the latest fisheries management regime. Potential measures may include provide training to assist employment opportunities. For those shifting to mariculture or suspending capture fisheries activities but retaining the existing operation of mariculture activities, assistant could be provided through training, development of advanced technologies / techniques to improve fisheries production; enhancement of feed efficiency and fish health by use of improved fish feed formulas and effective disease prevention measures. (c) ***Support the promotion and enhancement of fisheries-related business opportunities:*** Potential measures could include supporting fishermen in diversifying their fishing operations; and training of fishermen on developing and running fisheries-related ecotourism or sustainable seafood trading business. The three key FES aspect areas will require significant and ongoing funding over a number of years in order for the	

<table>
<tr><th>Request</th><th>Supplementary Information</th><th>Relevant Sections in EIA Report</th></tr>
<tr><td></td><td>key aims to be realised. AAHK acknowledges responsibility for such with Fisheries Enhancement Fund, however at this early stage in the development of the FES and its potential initiatives, further discussion will be conducted at a later stage to determine the exact funding amount and mechanisms for allocation of funds to proposed initiatives.
It is proposed that the FES, associated management arrangements, funding amounts and fund allocation mechanisms shall be established prior to commencement of the construction phase of the project. AAHK will continue to engage with a range of fisheries stakeholder groups so that their concerns and suggestions on fisheries enhancement measures can be taken into consideration where appropriate during the formulation of the FES and then during FES implementation.</td><td></td></tr>
<tr><td>(C) <u>Air quality and noise and impact on health</u>
➢ Explanation and justification on the assumptions of different modellings used in measuring air quality and noise impact</td><td><u>Air Quality</u>

The key assumptions for emissions from the Pearl River Delta Economic Zone (PRDEZ) and Hong Kong SAR are summarized below. For details, please refer to the relevant sections in Chapter 5 of the 3RS EIA report, including Sections 5.3.4.99 to 5.3.4.106, Table 5.3.75, Table 5.3.77 and Appendix 5.3.18.

<table>
<tr><th>Item</th><th>Emission Assumptions</th><th>Modelling Assumptions</th><th>Explanation and Justification</th></tr>
<tr><td colspan="4">PRDEZ Emissions</td></tr>
<tr><td>PRDEZ Emissions</td><td>• Emission based on JWGSDEP 12th Meeting 2012 and</td><td>• Modelled inside PATH to predict the future ambient air quality</td><td>• Based on the latest available information;
• The lower emission</td></tr>
</table>
</td><td>Sections 5.3.4.99 to 5.3.4.106</td></tr>
</table>

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		capped at Yr 2020 • The emission levels are higher than the estimates provided in the Mid-Term Review Report as adopted in the HZMB EIA Study		reduction target was adopted for conservative assessment purpose	
	Hong Kong Emissions				
	Power plant Emissions	• Emissions from power plant are capped through Specific Licences based on the "Third Technical Memorandum for Allocation of Emission Allowances in respect of	• Modelled inside PATH to predict the future ambient air quality	• Based on the latest available information	

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		Specified Liciences" issued under the Air Pollution Control Ordinance (Cap. 311) , which will be effective from 2017 • Emissions are assumed to be capped at these levels without further improvement			
	Road Emissions	• Based on the latest EPD's EMFAC-HK V2.6 model released in Jan 2014	<u>For ambient air quality:</u> • Modelled inside PATH <u>For proximity infrastructure within 5km from project boundary:</u> • Modelled by a near field model (CALINE4)	• EPD's EMFAC-HK V2.6 has taken into account the planned vehicular emissions control committed by HKSAR Government. Compared with the previous version which was adopted in the HZMB EIA, the latest EMFAC-HK V2.6 has	

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				incorporated in the following key changes: 1. Revised technical group fraction to reflect updated implementation schedule for Euro VI standards; 2. Included subsidy programme for the replacement of catalytic converters and oxygen sensors on LPG/petrol taxi and LPG light bus. For LPG private light bus >3.5t, new technology groups were added. 3. Revised implementation date of I/M programme using remote sensing and dynamometer testing for	

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				petrol/ LPG vehicles would start from Apr 2014. 4. Implementation of the programme on mandatory retirement of pre-Euro IV diesel commercial vehicles.	
	Navigation Emissions	<u>For ambient air quality:</u> Emission was projected using marine growth rate (based on Port of HK Statistical Table, Hong Kong Port Cargo Forecast, etc) as projection surrogate, taking into account the latest emission control strategy. <u>For Skypier and Chu</u>	<u>For ambient air quality:</u> • Modelled inside PATH <u>For Skypier and Chu Kong Shipping Enterprises:</u> • Modelled by a near field model (AERMOD)	• Based on the latest available information and committed control policy in HK and IMO	

Request	Supplementary Information				Relevant Sections in EIA Report
		Kong Shipping Enterprises: • Based on existing schedules, questionnaires, interview with operators and EPD's Study on Marine Vessels Emission Inventory (2012)			
	Other Fuel Emissions	For ambient air quality: • Emissions were projected based on population growth. For proximity infrastructure within 5km from project boundary: • Emissions based on available information from relevant SP	For ambient air quality: • Modelled inside PATH For proximity infrastructure within 5km from project boundary: • Modelled by a near field model (AERMOD)	• Based on the latest available information • Based on the latest available information	

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		licenses and previous EIA reports.			
	Emissions from non-combustion sources	• Emission was projected based on population growth	• Modelling inside PATH	• Based on the latest available information	
	Aviation Emissions				
	Aviation Emissions	• LTO emissions projection undertaking by IATA, taken into account introduction of new engines and continuous improvement of aircraft engines; • For other non-LTO emissions, please refer to S5.3.4 and S5.3.5 of the EIA	• Impact on Lantau area was modelled by near field models (AERMOD and CALINE4); • Impact on Tuen Mun Tap Shek Kok area was modelled by PATH model given the long distance from the airport; • Spatial emission distribution based on	• Based on the latest available information and aircraft emission policy of ICAO	

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	report for the details	3RS	

Noise

Regarding aircraft noise impact assessment, the assumptions / input data are listed and discussed in detail in **Sections 7.3.3.7 to 7.3.3.34** and the associated appendices presented as part of the 3RS EIA Report. The key aspects are recapped below:-

Sections 7.3.3.7 to 7.3.3.34

- Study Scenarios: The three future scenarios namely (a) worst operation mode; (b) interim phase operation mode; and (c) full operation mode are in accordance with the EIA Study Brief requirements. Sequential INM Analysis was first performed as a screening tool to identify the worst assessment year with maximum noise emission for subsequent assessment;
- Primary Mode of Operation: "Arrivals only, Departures only, Mixed" (ADM) is adopted as the primary mode of 3RS operation. The noise mitigation measures described in Section 7.3.3.11 and reproduced below will be implemented as standard HKIA operating procedures in 3RS primary operating mode.
  (a) Putting south runway on standby where possible at night;
  (b) Requiring departures via West Lamma Channel during east flow at night, subject to acceptable operational and safety consideration;
  (c) New arrival RNP Track 6 for preferential use in west flow direction; and
  (d) Implementation of preferential runway use programme.
- Input Data: Major input data to INM includes aircraft fleet mix, airport layout, aircraft flight tracks, and operational data. These are prepared in detail from various contributors, including design consultants, radar data by CAD, air traffic forecast by IATA and aerospace simulations by NATS for the future

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	scenarios. It shall be noted that the approach adopted is in accordance with ICAO Doc 9911 and provides a robust approach to the aircraft noise impact assessment. As stated in **Section 7.3.3.12**, validity of the recommended mitigation measures, and relevant input data, including operation modes, has been confirmed with CAD.	
➢ Justification on the assumptions on newer models of aircrafts with lower emission level used in the EIA assessment	**<u>Air Quality</u>** With reference to the details presented in **Appendix 5.3.1-2b** of the 3RS EIA Report, the requested justification on the assumptions on newer models of aircraft with lower emission level used in the EIA assessment are summarized below. As illustrated page 12 of Appendix 5.3.1-2b, it is anticipated that seven new families of aircraft will be deployed at HKIA before 2038. Six of these new aircraft models are currently under development by Airbus and Boeing. It means the high level specifications for these aircraft models and the fitting engines are already known, as well as the targeted date of entry-in-service. These new aircraft families have already been outlined on page 12 of Appendix 5.3.1-2b, with information on the fitting engine types and entry-in-service date and the information are reproduced below for easy reference:	Appendices 2.1 and 5.3.1-2b

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Example of New Aircraft	Estimated Entry In-Service at HKIA	Engine Type	Comments
Airbus A350-900	Late 2015	Trent XWB-79	▪ Only one selected engine so far
Airbus A350-1000	Late 2017	Trent XWB-97	▪ Rolls Royce given the monopoly on this aircraft sub-type
Airbus A320neo	2018	CFMI Leap-1A PW1127G	
Boeing 777-9X	2020	GE9X9	▪ GE given the monopoly on this aircraft
Boeing 737-MAX	2022	CFMI Leap-1B	▪ CFMI given the monopoly on this aircraft
Airbus A350 Freighter	2025	Trent XWB-84	▪ Only one selected engine so far
Airbus A380neo	2026	GEnx-1B70 Trent XWB-74 RR Advance 3	

The main drivers for aircraft replacement are: Safety, pressure to reduce operating costs and maintenance, high jet fuel prices, increased utilization of aircraft (in number of hours/day), and passenger preference for new aircraft.

IATA undertook a survey to seek input from 40 passenger and cargo airlines representing 80% of 2011 traffic. 31 airlines representing 67% of the air traffic movements recorded during the 2011 busy day responded and provided input. The responded airlines indicated that they phase out their aircraft after 15 to 25 years of operations with the vast majority of them (representing 82% of the traffic) saying between 20 and 25 years.

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The information collected from the specific airlines operating at HKIA is consistent with observations made worldwide. Therefore, it has been considered the information received from the surveyed airlines is reliable.

- Boeing estimates that the average retirement age of passenger aircraft was slightly above 20 years in 2012 (source: http://www.boeing.com/assets/pdf/commercial/aircraft_economic_life_whitepaper.pdf).
- Analyzing the fleets of the major airlines worldwide one can also observe that current average aircraft age by type never exceeds 25 years and rarely exceeds 20 years (see table below).

Average fleet age by airlines and by general aircraft type (selected airlines)

Aircraft	American Airlines	Air Canada	United Airlines	US Airways	Air France	British Airways	Lufthansa	KLM	TAM	Air China	Air New Zealand	All Nippon Airways	Asiana	Cathay Pacific	China Airlines	China Eastern	China Southern	Garuda	Japan Airlines	Qantas	El Al	Emirates
Airbus A300																19.6						
Airbus A318					9	4.8																
Airbus A319	0.7	16.3	14.4	13.7	13.7	12.4	12.3		7.9	8.9						6.3	8					2.8
Airbus A320		21.1	16	14.9	7.6	7.8	12.2		7.7	4	6.5	19.3	7			6.9	5.4					
Airbus A321	0.3	12.2		5.7	11	8.6	9.7		3.8	3.8			6.6			4.5	5.8					
Airbus A330		13.8		7.3	11.5		7	6	8.9	4.3			4.8	7.5	6.7	4.4	4.6	7.7		6.8		13.3
Airbus A340					16.1		11.1			15.8				17	12.6	10.5						12.1
Airbus A380					3.7	1.1	3.4										2.6			4.8		2.9
Boeing 737				24.4		21.6	23.1			19.4	15.3					16.4	19.7	18.2				
Boeing 737 Next Gen	6.5		9.1					7.9		6.3		4.5			10.9	5	5.4	4.8	6.2	6.9	9	
Boeing 747			18.8		16.1	19.1	11.3	19.4		18.1	19.3		18.3	10.3	12.1		11.9	20.3		16.2	18.8	6.6
Boeing 757	18.5		18.8	20.9						18.7							17.9					
Boeing 767	20.3	21	17	24.3		21			4.1		18.6	14.7	17.7						11.1	19.5	18.7	
Boeing 777	11.1	5.1	15		9.6	12.3	0.5	7.4	3.1	5.6	6.1	10.3	7.9	7			9.8	0.8	11.7		10.9	6.1
Boeing 787			1.1			0.8						1.6					0.9		1.3			
McDonnell Douglas MD-11							15.8	20														
McDonnell Douglas MD-80/90	22.1																					
Embraer 135/145																7.8	9.6					
Embraer 190/195		7.2		6.5													2.1					
ATR 42/72																		0.4				
Canadair Regiona Jet (CRJ)																		1.1				

Source: AirSafe.com (http://www.airsafe.com/events/airlines/fleetage.htm)

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	As already highlighted in Section 9 of Appendix 2.1, when preparing the busy day schedules, aircraft replacement was based on the following consideration by IATA: • Age of the aircraft in operation • Airline phasing out plans • Airline fleet development plans (incl. aircraft on order) • Type of route: range and size Looking at Cathay Pacific / Dragonair, for example, a total of over one hundred aircraft are on order for delivery between now and 2025 confirming the intent of the Hong Kong based carrier to renew their fleet: • 21 x B777-9X • 18 x B777-300ER • 10 x A330-300 • 58 x A350 • 4 x B747-8F Source: http://www.cathaypacific.com/content/dam/cx/about-us/investor-relations/interim-annual-reports/en/2013_annual-report_en.pdf	
	<u>Noise</u> On the aircraft noise aspect, as detailed in **Appendix 7.3.2**, when an aircraft is not contained in the INM available aircraft databases, a substitution must be used. Aircraft currently not represented in the INM aircraft databases but are forecasted to be operating at HKIA in the future, were determined by using appropriate aircraft substitutions. Substitution by the newest available and similar model is adopted, which is a conservative approach because future aircraft should be developed with quieter technology. FAA's view was consulted as technical support.	**<u>Noise</u>** Section 7.3; Appendix 7.3.2

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		As stated in **Section 7.3.3.12**, validity of the relevant input data, including the said substitution, has been confirmed with CAD.	
➢	Scenario testing of the southern runway (planned to be at standby after midnight at around 1% use);	As discussed in **Section 7.3.3.21**, regarding putting south runway in standby during night time, taking into account operational requirements such as recovering from an incident or other major operational disruption (e.g. typhoon), it was assumed that the south runway would only be used for 1% of total yearly night period in the noise modelling run for the years 2030 and 2032 scenarios. This is reflected in **Attachments 3B and 3C in Appendix 7.3.5**. The sum of movements in runways 07R and 25L between 2300 and 0659 (ie. Night 2 to Night 5) contributes 1% to the sum of movements of all runways between the same night time period. This is the input data to the INM for aircraft noise simulation. It is essential to understand that since aircraft noise in terms of NEF adopted for planning purpose represents cumulative noise for average-annual daily conditions by definition, rather than individual / single day event. Therefore, it would not be appropriate to model the 1% use of the south runway under a separate scenario.	Section 7.3
	Quantitative measures for auditing and monitoring purpose other than using NEF as the calculation methodology;	As detailed in **Section 4.1** of EM&A Manual, the following major tasks have been recommended: • A Prediction Verification: A verification on the effectiveness of measures to mitigate aircraft noise impact of the project shall be undertaken upon availability of relevant airport operation data for the first full year operation of the proposed third runway as described in of the EIA Report. As part of the prediction verification exercise, AAHK should collect radar data showing airport and flight operations for the first full year operation of the proposed third runway from CAD. Based on the radar data collected, the AAHK should carry out aircraft noise contour simulation. • Annual Review Report: Various information / data, including radar data, will be collected and reviewed	Section 4.1, EM&A Manual

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	in terms of runway and flight track utilisations for checking effective implementation of mitigation measures proposed. Moreover, available operational noise data collated by the relevant authorities will also be included and referenced. • 5-year Noise Contour Report: Actual flight data will be analysed to prepare NEF contour to confirm the representativeness of the earlier noise analyses. We believe that the above EM&A tasks could quantitatively monitor and audit aircraft noise during operation of the 3RS.	
Evidence of commitment or understanding with CAD and the Mainland aviation authority on the strategy of putting the southern runway on midnight standby mode	As stated in **Section 7.3.3.12**, validity of the recommended mitigation measures (including putting south runway on standby during night time), and relevant input data, including operation modes, has been confirmed with CAD. As already pointed out in Para. 2.3.6.6 of the EIA report, "there is a plan agreed among relevant civil aviation authorities of Mainland, Macao and Hong Kong to address the issues relating to optimizing PRD airspace.". However, it shall be noted that the strategy of putting the south runway on standby at nighttime is not directly relevant to optimization of PRD airspace.	Section 7.3
➢ Complaint from a Tsuen Wan District Councillor (letter enclosed) that there was a marked jump of noise exceedance case of 80 dB(A) at Ma Wan	As discussed in **Section 7.3.3.11**, a number of aircraft noise mitigation measures have been identified and these will be implemented as standard HKIA operating procedures in the operation of the 3RS under the primary operating mode, in particular the following:- • A new arrival Required Navigation Performance (RNP) Track 6 has been designed for preferential use in the west flow direction (i.e., runway 25 direction) between 2300 and 0659 and it is assumed that up to 95% of flights may preferentially use this new Track 6 instead of the existing straight-in tracks by year	Section 7.3

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from one case in 1997 to over 300 in 2007. There should be concrete and material mitigation measures proposed in the EIA report to address the residents' concern, including those living in Ma Wan, Tsing Yi, Siu Lam and Tuen Mun, etc.	2030; and • Implementing a preferential runway use programme when wind conditions allow such that west flow is used when departures dominate while east flow is used when arrivals dominate during night-time. These would help reduce the percentage of flight movements near / over Ma Wan in the future 3RS operation. Besides, AAHK has also been working closely with the CAD to formulate a series of direct noise mitigation measures for reducing aircraft noise under the existing airport operation. These include the banning of Marginally Compliant Chapter 3 aircraft for landings and take-offs at HKIA during nighttime since the end of March this year. CAD has planned to extend the MCC3-Prohibited Period to cover the whole day for the existing two-runway operation from late October 2014. Since February 2012, the CAD has implemented a new set of flight procedures that aim to allow aircraft which could use satellite-based navigation technology in their flights to adhere closely to the nominal centre line of the flight track when departing to the northeast of the Hong Kong International Airport (HKIA) and making south turn to the West Lamma Channel, thereby keeping the aircraft at a distance away from the areas in the vicinity of the flight paths, and reducing the impact of aircraft noise on these areas.	
➢ On AQ – AAHK's explanation/comments on FoE's query on the lower NOx concentration level in Tung Chung/Sha Chau/Sha Lo Wan area	Firstly, we would like to point out that both the HZMB EIA and 3RS EIA did not include operational air quality assessment result in Sha Chau area. On analyzing the results of the HZMB EIA and 3RS EIA, the major emissions in the HZMB EIA case, in particular in the Tung Chung area, is from vehicular emissions. On comparing **Table 5.3.59** & **Table 5.3.63** of the 3RS EIA report and **Appendix 5D** & **Appendix 5F** of the HZMB EIA report, the vehicular emission	Chapter 5

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	when compared with the assessment result in the HZMB projects; what is the assessment for the situation in the Tsuen Wan/Ting Kau/Siu Lam/Tuen Mun area	of NO_x in Lantau area in the 3RS EIA is around 50 – 80 % lower than that of HZMB EIA. Hence, this reduction in vehicular emission would result in a significant drop in NO_2 concentration in the Tung Chung / Sha Lo Wan area. To further clarify, the lower in vehicular emissions in 3RS EIA is due to the adoption of the latest vehicular emission control policy proposed by the Government, which includes the followings: • Tightening the vehicular emission standard to more stringent Euro VI • Including subsidy programme for the replacement of catalytic converters and oxygen sensors on LPG/petrol taxi and LPG light bus. • Revising implementation date of I/M programme using remote sensing and dynamometer testing for petrol/ LPG vehicles would start from Apr 2014. • Implementing the programme on mandatory retirement of pre-Euro IV diesel commercial vehicles. According to the EIA study brief, the study area for the operational air quality assessment is 5km from the project boundary. Hence, there is no assessment for the Tsuen Wan / Ting Kau / Siu Lam / Tuen Mun Area (except for Tap Shek Kok Area). For the Tap Shek Kok area which is within 5km from the project boundary, no non-compliance against HKAQO is predicted in the current study. From the air quality modelling results presented in Table 5.5.2, it can also be noted that nitrogen dioxide originating from airport operation under 3RS will account for only about 2μg/m^3 of the annual NO_2 concentrations (i.e., 5% of AQO limit) at Tung Chung. According to, for example, the definition of the impact magnitude for changes in ambient pollutant concentrations recommended by the Institute of Air Quality Management (UK), a change of the order of 1-5% of the annual AQO limit can be regarded as small.	
➢	On Noise – noise exceedance at 60-70	Health impact by aircraft noise is evaluated in **Section 17.3**. In particular, the key health end points of annoyance and self-reported sleep disturbance are assessed in metrics of L_{den} and L_{night} respectively, rather	Section 17.3

	Request	Supplementary Information	Relevant Sections in EIA Report
	dB(A) in HZMB case has reckoned health impact; any comparable assessment measures done for 3RS rather than relying on the NEF calculation methodology	than NEF. To our understanding, health impact assessment related to noise was not conducted in the HZMB EIA Study.	
➢	Concerning table 17.3.2, while there would be a net decrease in the overall highly annoyed population, please provide geographical breakdown of the net increase in the highly annoyed population group in the 50 – 55db range and compared thereof with the net decrease in the highly	The HIA analysis on aircraft noise focused on comparing the changes of health impacts between the operation of 3RS and 2RS in 2030, i.e., the year of "worst operation mode", which represented the maximum total aircraft noise emission. The assessment methodology was developed after a review of relevant practices in Hong Kong and overseas. As described in Section 17.3.3.12 of the EIA Report, taking into account the aircraft noise standard adopted in Hong Kong and the findings of the aircraft noise assessment presented in Section 7.3, the noise sensitive populated districts/regions located adjacent to the NEF25 contour line in year 2030 have been identified as the locations of interest and considered collectively as the assessment area for a quantitative comparison of the 3RS scenario with the 2RS scenario. From the established annoyance analysis, it is noted that the net increase in the highly annoyed population group in the 50-55 Lden, dB range is contributed by exposure in Tung Chung area but this is associated with a reduction of exposure population in the 55-60dB range in Tung Chung in the presence of the proposed mitigation measure of putting the south runway on standby where possible at nighttime between 2300 and 0659.	Section 17.3

Request	Supplementary Information	Relevant Sections in EIA Report
annoyed population group in the 55 – 60db range so as to quantify the percentage of overlap of these two groups of population and to ascertain whether the net increase in the 50 – 55db range is arisen from the same or a separate geographical area		
(D) <u>Methodology</u> ➢ To provide information <u>in table format</u> regarding Dr Hung Wing-tat's question (AAHK's response to Q.5) on the comparison and contrast of the environmental benefits and disbenfits of various scenarios with or without the project, i.e. Two-Runway System vs Three-Runway System	Based on the details presented in Chapters 2 and 3 of the EIA report, the environmental benefits and disbenfits associated with the 2RS and 3RS scenarios are summarized below.	Sections 2 and 3

<table>
<tr><th>Request</th><th>Supplementary Information</th><th>Relevant Sections in EIA Report</th></tr>
<tr><td></td><td>
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<tr><th>Scenario</th><th>Environmental Benefits</th><th>Environmental Disbenefits</th></tr>
<tr><td>2RS</td><td>Absence of the environmental impacts identified in Sections 5 to 16.</td><td>As discussed in Section 2.5.4, the absence of the 3RS may lead to:
There would not be any spare capacity for preferential use of runways and flight paths. Flights on existing routes over populated areas would only increase, thereby potentially worsening aircraft noise impacts to populated areas.
Without the third runway, the effective measure of putting the south runway on standby during nighttime where possible proposed for 3RS operation cannot be introduced i.e., the south runway will need to be used during those nights when the existing north runway is under maintenance in the 2RS operation.
Air traffic congestion would also increase, leading to increased holding times for landing and take-off. This would increase aircraft emissions on the ground and in the local airspace.</td></tr>
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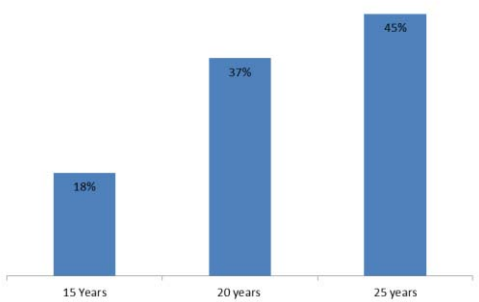
Request	Supplementary Information			Relevant Sections in EIA Report
			• Other environmental efficiency improvements associated with design and operation of facilities and infrastructure associated with 3RS would not be realized in the absence of the project.	
	3RS	As discussed in **Section 2.4.5**, the environmental benefits include: • Allow more flexibility in airport operation, including avoid night time use of the southern runway • Allow implementation of preferential flight track use for aircraft landing and take-off. This will minimise air traffic movement over populated areas and reduce the number of noise sensitive receivers coverd by the NEF contours. • With increased runway capacity, the waiting time required for approaching aircrafts to land will	The environmental disbenefits associated with the 3RS are the impacts identified and assessed throughout **Sections 5 to 16**.	

Request	Supplementary Information			Relevant Sections in EIA Report
		be reduced, thereby reducing the associated emissions arising from aircrafts circling the airport. • Enable beneficial use of unwanted materials generated by other projects. • Create opportunities for incorporating elements into the design of facilities and infrastructure that are able to enhance environmental efficiency and minimise environmental impacts.		
➢ Information on the "wide survey" report mentioned in AAHK's response. Identity of individual airlines will not be required	In order to make an estimate on when aircraft would be retired, IATA sought detailed inputs from 40 airlines representing 80% of the ATMs on the 2011 HKIA busy day. 31 airlines representing 67% of the air traffic movements recorded during the 2011 busy day responded and provided input. Airline fleet mix was adjusted throughout the years to follow the plans communicated by (or assumed for) each airline also considering the actual age of the aircraft and the airline phasing out plans for specific aircraft types when available.			Section 2.3.4 and Appendix 2.1

Request	Supplementary Information	Relevant Sections in EIA Report
	The key messages drawn from the survey as regards with fleet are the following: All surveyed airlines plan to retire their aircraft after 15 to 25 years of operations (see chart), with a majority of them mentioning 20 to 25 years; **Phasing out age for airliners** in % of respondent busy day ATM  *Source: HKIA Airlines survey administered by IATA on behalf of AAHK, November 2012* • On average 20 years is the most mentioned operational life time for narrow-body aircraft while 25 years is the most frequent for wide-body aircraft; • B747-400 (passenger version) will be fully taken out from HKIA by 2023, while B747-400F (cargo version) will be in use until 2034; • A340 will be fully retired by 2019; • A330-300 and B777-300ER will be flown throughout the all period; • MD11F will be retired by 2019 and A300-600F before 2025	

Request	Supplementary Information	Relevant Sections in EIA Report
➢ Information on the survey form presented to the 40 airlines as mentioned in AAHK's response	A copy of the questionnaire used by IATA in the survey has been attached separately for members' reference.	Section 2.3.4 and Appendix 2.1