

12 CONCLUSIONS

12.1 Introduction

12.1.1 The Telegraph Bay EIA has focused on identifying and providing mitigation options for the potential impacts associated with both the advance works / construction phase of the development and the post-development site occupation.

12.1.2 The following aspects have been assessed:

- Air Quality;
- Noise;
- Sewage;
- Water Quality;
- Waste Management Implications;
- Ecology (Terrestrial and Marine); and
- Landscape and Visual Impacts.

12.1.3 The findings of the assessments are summarised in Table 12.1 which details:

- Key impacts (without mitigation measures) for each of the environmental aspects considered;
- Proposed measures (where appropriate) to mitigate against the identified impact; and
- Residual impacts (following implementation of mitigation measures).

12.1.4 The residual impacts define the acceptability or otherwise of the project, and are categorised in general accordance with guidance offered by the Technical Memorandum on Environmental Impact Assessment Process (EPD, 1997). Five impact categories have been adopted:

- The impact is *beneficial* if the project will improve the overall quality of the environmental aspect under consideration;
- The impact is *acceptable* if the assessment indicates that there will be no significant effects on the environmental aspect under consideration;
- The impact is *acceptable with mitigation measures* if there will be some adverse effects, but these can be eliminated, reduced or offset to a large extent by specific measures;
- The impact is *unacceptable* if the adverse effects are considered excessive and are unable to be practically mitigated. In these circumstances compensation may have to be considered by Government; and
- The impact is *undetermined* if significant adverse effects are likely, but the extent to which they may occur or be mitigated cannot be determined from the study. Further detailed study will be required.

12.1.5 The time scale over which the impacts will occur has also been categorised into short, medium or long term, and reversible or irreversible.

Table 12.1 Summary of Environmental Assessment Findings

Environmental Aspect	Key impacts (without mitigation measures)	Proposed Mitigation Measures	Residual Impacts (following mitigation)	Time Scale of Impacts
Air Quality (Construction)	Short term elevated dust levels are expected.	Regular watering of haul road surfaces, on-site vehicle speed control and covering/dampening of stockpiles in dry/windy conditions.	Acceptable with mitigation measures.	Short term, reversible.
(Operational)	Odour (during maintenance stage).	Central deodorization system with two primary treatment systems for emergency breakdown and media replacement period. Removal of solids/sludge in enclosed environment with all the air treated prior to discharge.	Acceptable with mitigation measures.	Short term, reversible.
Noise (Construction)	Elevated construction noise levels are anticipated.	Adoption of quiet plant, 3m high noise barrier along northern site of Site 1 and use of acoustic barriers for selected equipment during examination periods.	Acceptable with mitigation measures.	Short term, reversible.
(Operational)	Traffic noise impacts from Route 7.	Noise barriers (roadside and central reserve), and partial noise enclosures.	Acceptable with mitigation measures.	Not applicable.
Water Quality (Construction)	Elevated suspended sediment concentrations in the vicinity of construction works.	Use of controlled dredging techniques as required. Collection and off-site disposal of sewage, coverage and containment of loose materials and associated run-off. Appropriate treatment of all effluent prior to discharge.	Acceptable with mitigation measures.	Short term, reversible.
(Operational)	Sewage treatment plant (dilution model indicates minimal impacts).	Chemically enhanced primary treatment and disinfection prior to discharge.	Acceptable with mitigation measures.	Short term, reversible.

Environmental Aspect	Key impacts (without mitigation measures)	Proposed Mitigation Measures	Residual Impacts (following mitigation)	Time Scale of Impacts
Wastes (Construction)	Wastes produced during construction will include excess surcharge material from reclamation activities, excavated spoil, waste from associated construction works, marine dredgings, small quantities of chemical wastes, sewage and municipal wastes.	Normal construction waste management measures are proposed, including standard marine disposal practice, full consideration on the potential for re-use of excess spoil, segregation of recyclable and non-recyclable wastes (where practicable) and good housekeeping practice to minimise nuisances.	Acceptable with mitigation measures.	Not applicable.
(Operational)	Sewage and municipal wastes.	Sewage treated in CEPT works. Good housekeeping practices for waste storage/handling.	Acceptable with mitigation measures.	Not applicable.

Environmental Aspect	Key impacts (without mitigation measures)	Proposed Mitigation Measures	Residual Impacts (following mitigation)	Time Scale of Impacts
Ecology (Construction)	Habitat loss:			
	<ul style="list-style-type: none"> 1ha of woodland and 1 ha of shrubland 	Clearance in phases to allow mobile species to relocate. Fencing to prevent access into remaining areas. On-site compensation (compensatory planting).	None	Long term, irreversible
	<ul style="list-style-type: none"> 20 m of southern stream 	Realignment as close as possible to existing course and use of gabions to simulate natural habitat.	Acceptable with mitigation measures.	Long term, irreversible
	<ul style="list-style-type: none"> 150 m of marine intertidal area 	None proposed.	Acceptable.	Long term irreversible
	Noise and dust	Construction dust and noise measures will be provided to meet EPD criteria. Good site management practice should be adopted to minimise impacts.	None.	Short term, reversible
	Increased suspended solids and sediment levels in streams and subtidal areas	No specific measures proposed. Good site housekeeping will minimise impacts.	None.	Short term, reversible
(Operational)	Noise and dust	Fences to limit access into the remaining woodland areas. Inclusion of dust-tolerant species in compensatory planting.	None.	Long term, reversible
	Wastewater/sewage discharges	Sewage discharge will be treated by CEPT works.	None.	Long term, reversible

Environmental Aspect	Key impacts (without mitigation measures)	Proposed Mitigation Measures	Residual Impacts (following mitigation)	Time Scale of Impacts
Landscape & Visual (Construction)	Loss of trees.	Full tree survey, felling application, protection and re-provisioning in accordance with WBTC 24/94.	Acceptable with mitigation measures.	Long term, irreversible.
	Views of construction works.	Elevated location of VSRs precludes mitigation measures, e.g. hoardings.	Short term only.	Short term, reversible.
(Operational)	Change in landscape character.	Creation of new high-rise residential landscape character of quality.	Acceptable with mitigation measures.	Long term, irreversible.
	Change in visual character.	Impacts minimised during design stage, e.g. retention of view corridors. Creation of new development of coherent landscape and visual feature.	Acceptable with mitigation measures.	Long term, irreversible.

12.2 Air Quality

- 12.2.1 The FDM modelling results indicate that with dust suppression measures, such as regular watering unpaved haul roads, controlling on-site vehicle speed to 10 km/hr and covering / dampening stockpiles during dry and windy conditions, the 1-hour TSP criterion and 24-hour TSP AQO will be met at all identified air sensitive receivers.
- 12.2.2 CALINE4 modelling results indicate that without direct mitigation, the worst case NO₂ and RSP concentrations are well below the applicable AQO levels at the identified ground level air sensitive receivers. Because the NO₂ and RSP concentrations due to vehicular emissions from the nearby roadways decrease with elevation, it is concluded that the operational air quality impacts from the proposed Road D1 and Route 7 are insignificant.
- 12.2.3 With the implementation of the proposed deodorization system, the predicted odour impacts from the sewage treatment works are anticipated to be acceptable. The ISCST3 modelling results indicate that the odour concentration at the nearest ASRs comply with the established criterion in EIA-TM. Odour control during maintenance stages have been outlined.

12.3 Noise

- 12.3.1 The EIA assessment has concluded that there are no adverse noise impacts which cannot be appropriately mitigated that are associated with construction of Telegraph Bay Development and Route 7 (Telegraph Bay section only). The contractors however will be required to use acoustic barriers for selected plant during examination periods.
- 12.3.2 With the proposed mitigation measures, the predicted traffic noise levels at all identified sensitive receivers (residential premises and education institutes) comply with the criteria set out in the EIA-TM.
- 12.3.3 With the proposed mitigation measures, the traffic noise levels from access roads within the proposed development will not adversely impact nearby NSRs.

12.4 Sewage

- 12.4.1 The study concluded that the only feasible proposal is to provide a Sewage Treatment Works with preliminary treatment/screening, CEPT and disinfection at ground level within the G/IC site. Disposal of effluent from this STW in the interim period will be via a temporary 300m submarine outfall. Upon commissioning of the SSDS stage III/IV scheme (2006/7) the submarine outfall can be abandoned and the CEPT facility should be removed, leaving the land available for other uses within the G/IC area.

12.5 Water

- 12.5.1 Through the implementation of the recommended mitigated measures and management practices, it is anticipated that the impacts upon the seawater intake points and freshwater streams will be temporary and minimal.

- 12.5.2 With the adoption of proper mitigation measures during the dredging of marine mud for submarine outfall construction and surcharging work, the disturbance to the marine bed and loss of dredged and fill material can be minimised. Therefore, no significant impacts upon the East Lamma Channel and corals to the North of Lamma Island arising from these activities is expected.
- 12.5.3 The construction of quay deck may create short term impacts on the marine water quality and the situation will be restored once the piling work is finished. By proper phasing of the piling work, the impacts can be further controlled. Given the physical separation between the quay deck and corals, the impacts upon the corals from the quay deck construction will be insignificant as the majority of the pollutants would be well dispersed / diluted before reaching it.
- 12.5.4 By realigning the “Southern Stream” prior to the commencement of the southern access construction, the impacts upon the stream will be minimal provided that the design of the proposed stream alignment has avoided significant alternation to the stream flow hydraulics.
- 12.5.5 During prolonged or excessive wet weather periods, even after implementing the precautions detailed in Appendix A2 of ProPECC PN 1/94, discharges of waters high in suspended solids may occur. However, given the temporary nature of such events, the actual water quality impacts within the East Lamma Channel would be minimal.
- 12.5.6 It is anticipated that any impacts will be minor, temporary and localised if the identified mitigation measures are properly applied. It is envisaged that there will be no significant impact on the existing seawater intakes, drain outfalls and on both marine and fresh water ecology.
- 12.5.7 During operation, the dilution model results indicate that even the largest mixing zone (with an area of 96m x 210m) will not reach the coral community nor any of the seawater intakes or storm drains outfall locations. The related impacts are therefore considered to be negligible. No residual impacts have been identified during the operational phase although sewage outfall monitoring programme has been recommended to validate the dilution modelling results.

12.6 Waste

- 12.6.1 In order to suitably manage the potential environmental effects full consideration should be given of the re-use of surplus clean material on site (where practicable) or within other development projects once material balances are known.
- 12.6.2 In view the large volumes of material to be removed during the advance and construction works this would assist in reducing impacts to known pressures on the filling capacity of public filling areas.
- 12.6.3 All mitigation measures and waste management procedures outlined within the EIA should be in place to control or eliminate the potential impacts to the environment from waste generation. Provided these are in place the potential impacts to the environment are considered to be minimal.

12.7 Ecology

12.7.1 The faunal and floral element of the habitats were not identified to be rare although three protected species were recorded. The intertidal zone is largely part of the reclamation which has a low diversity of marine flora and fauna. There are also two natural rocky shore areas to the north and south of the reclaimed area which also have a low diversity of marine flora and fauna and no rare or protected species have been identified. The shoreline is not known to have an established coral community, which would be affected by the development project.

12.8 Landscape and Visual Impact

12.8.1 The incorporation of the opportunities and constraints, identified in the landscape and visual resource analysis, during the design process (as described in LWP2 and ENWP3) has avoided many of the potential impacts of the development and resulted in a single preferred option being formulated. This preferred option has a number of impact minimisation features integrally designed to avoid excessive conflict on the surrounding sensitive receivers.

12.8.2 A scheme of this type and scale will inevitably result in significant landscape and visual impact, as have been identified by the assessments. The primary ones are the loss of local woodland at the base of the existing surrounding hill and the visual impacts to the residents in close proximity to the site. However, the type and scale of the development, together with the elevated location and height of the surrounding VSRs, result in opportunities for direct mitigation, such as screen planting, to alleviate the impacts being limited.

12.8.3 The development will change the existing landscape and visual character of the area, from an area of open reclamation, which is naturally revegetating, to a modern high-rise residential area. The Landscape Master Plan, although it cannot provide direct mitigation such as screen planting, for all those affected visually aims to complement the urban layout and arrangement of the blocks and help create a new urban and landscape character to the area.

12.9 Environmental Monitoring and Audit

12.9.1 The environmental monitoring and audit (EM&A) programme will be prepared in conjunction with the final EIA Report for the project. The EM&A plan will specify environmental monitoring to be conducted prior to and during the construction phase. Only sewage outfall marine water quality monitoring and discrete noise measurements have been proposed for the operational phase.

12.9.2 A recommended approach for the EM&A programme, which follows EPD guidelines, is set out below in Table 12.2.

Table 12.2 Recommended Approach for EM&A Programme

<i>Approaches</i>	Description
Environmental Monitoring	This includes the systematic collection of environmental data with various monitoring activities such as: <ul style="list-style-type: none"> ● Baseline Monitoring ● Impact Monitoring ● Compliance Monitoring
Environmental Quality Performance Limits	<ul style="list-style-type: none"> ● For the purpose of environmental monitoring and audit, environmental quality performance limits are normally in the form of a set of action/limit levels. ● In addition, a trigger level below the action level may be set up to provide early warning of deteriorating environmental quality that may exceed the action level.
Environmental Monitoring and Audit Documentation	Documents normally required are: <ul style="list-style-type: none"> ● EM&A Manual ● Baseline Monitoring Report ● Regular and Summary EM&A Reports

12.9.3 The EM&A programme, which describes the environmental monitoring requirements should include baseline, impact and compliance monitoring. In addition, recommendations for environmental complaint procedures should also be presented, as will the proposed reporting and audit requirements. Event Contingency Plans also need to be contained in the EM&A Programme which specify procedures and actions to manage the Project’s response to any identified unacceptable environmental impacts.

12.9.4 The EM&A requirements, such as locations for monitoring stations parameters, frequency and duration for baseline, impact and compliance monitoring as well as environmental quality performance limits (Action and Limit levels), will also need to be developed in greater detail when construction activities are confirmed and full details of the development are available.

12.9.5 Environmental auditing is recommended to test the adequacy of the overall environmental management systems and the effectiveness of the environmental monitoring programme adopted. These audits should be carried out by an independent body on a regular basis, say at monthly intervals. The audit should cover the following:

- Reviewing and verifying information available in records developed through the monitoring programme;
- Identify specific issues of non-compliance and recommendations to rectify them; and
- Check effectiveness of control measures and review the need for further control measures.

12.9.6 In addition to the above, audit of environmental complaints handling should also be carried out to verify that complaints are properly channelled and addressed.

12.10 References

EPD (1997) Technical Memorandum on Environmental Impact Assessment Process, Hong Kong Government.