



Contents

5.	Land	5-1
5.1	Earthworks	5-1
5.1.1	Fill	5-1
5.1.2	Erosion	5-2
5.1.3	Acid Sulphate Soils	5-3
5.2	Mineral Resources	5-4
5.3	Landscape Character and Visual Amenity	5-4
5.3.1	Impacts on Visual Amenity	5-4
5.3.2	Mitigation Measures	5-6
5.4	Native Title	5-8



5. Land

5.1 Earthworks

A number of submissions requested further detail of proposed earthworks associated with the HHI Development. In particular, submitters were concerned that insufficient detail was provided to adequately assess potential impacts.

Specific details on the type, location and size of excavation activities will be dependent on the final development configuration. At this stage of project planning, the final development configuration has not been completed, as a result earthworks plans cannot be developed. All earthworks will be contained within the mapped HHI Development footprint presented in Section 2.1 of this Supplementary Report. As discussed in Section 3.2.1 of the EIS, the development principles for slopes, hills and drainage include:

- design and conduct earthworks to avoid significant changes to topography and minimise cut and fill;
- natural catchments and flows are maintained through earthworks and stormwater management;
- principles of Water Sensitive Urban Design are followed for all stormwater management;
- avoid areas that are naturally waterlogged and/or avoid widespread clearing.
- avoid unstable slopes where significant engineering solutions are required to ensure stability; and
- views from headland and Hummock Hill are retained and public viewing areas provided.

The strategies for meeting these principles and to minimise potential impacts include:

- Master Plan avoids steep slopes. Development on hillsides is minimal;
- hillsides and ridgelines are not altered by bulk earthworks;
- stormwater management system maintains existing quality and quantity of flow;
- public access is to headland and hill top areas in accordance with Code for Conservation Precinct; and
- erosion prone area and estuarine area is retained as an undeveloped corridor.

5.1.1 Fill

One submission requested detailed information showing the location of where fill material external to the site will be used and also requested information about the source of this fill material.

As discussed in Section 5.1 above, specific details on the type, location and size of excavation activities are not available at this stage of project planning. However, in the case where fill material is required to be brought on site from an external source the following principles will be adhered to:

- ensure that any fill material brought on to the site meets the requirements of:
 - National Environmental Protection (Assessment and Site Contamination) Measure;

- Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland (1998);
- all fill material must be virgin excavated natural material (soil, aggregate etc);
- ensure that the site source of the imported fill is not listed on the EMR/CLR Register;
- conduct visual inspections of the imported fill material to ensure that it contains no waste material; and
- obtain documentation from the fill provider, which must contain the following:
 - date of arrival on site;
 - volume/ quantity of fill material;
 - provider;
 - source of fill material; and
 - documentation that the site of the fill material is not listed on the EMR/ CLR.

5.1.2 Erosion

Several submissions raised the issue about the control of erosion and sediment during construction and the need to mitigate potential impacts.

As discussed in Section 5.2.4 of the EIS, potential disturbance to land, and in particular clearing of vegetation may lead to exposure of erosion prone soils. Erosion of these soils can result in releases of fine sand and clay particles and suspended sediment materials to local drainage lines and streams. Sedimentation of the waterways results in the deterioration in water quality and aquatic habitat values and, in more severe cases, effects on flows and flooding characteristics of these watercourses. Sedimentation may also impact on marine water quality and habitat values in the adjacent World Heritage Area.

It is proposed to manage erosion and sediment through the development of an Erosion and Sediment Control Plan (ESCP), which complies with erosion and sediment control guidelines for Queensland Construction Sites (Witheridge and Walker, 1996) which include measures such as:

- consider construction sequence and timing to minimise exposure to rain and ephemeral stream flows;
- minimise areas of disturbance, particularly of dispersive material;
- ensure suspended sediment levels in waters discharged are no, or marginally, higher than in receiving waters;
- employ progressive site clearance and site rehabilitation techniques;
- utilise sediment barriers and sedimentation ponds;
- protect stockpiles of soil material with quick-growing grass species;
- protect areas from excess run-on flows;
- shape landforms to take account of the erodibility of soil materials used;



- protect significant vegetation within the riparian zone for as long as possible. Employ revegetation guidelines outlined in Abernethy and Rutherford (1999) and Rutherford et al. (2000), including using vegetation species common locally and appropriate to the soil materials;
- rapid revegetation of disturbed areas;
- diverting uncontaminated run off away from cleared/contaminated areas;
- controlling runoff through sedimentation dams, drains and disposing to stable drainage lines;
- bunding stockpiled material;
- remove of loose, surplus excavated sand, gravel and clays to prevent excessive erosion;
- confining traffic to defined roads and access tracks;
- compacting high traffic areas; and
- excavations backfilled and covered with topsoil.

Further discussion of mitigation measures is provided in Section 17.4.4 of the Supplementary Report.

5.1.2.1 Beach Access

One submission claimed that although the HHI Development does not encroach on erosion prone areas defined in Policy 2.2.2 of the

State Coastal Management Plan, that access to the beach would damage the dunes.

The proposed HHI Development, apart from the boat ramp, bridge and water infrastructure is located outside of the coastal management district which is also the erosion prone area. Infrastructure within the district is proposed to be designed and constructed to minimise impacts to coastal process and resources. They will be subject to a development assessment process following the EIS whereby relevant conditions can be applied to minimise impacts if necessary.

Access to the beach will be controlled through designated pathways for pedestrian use only. The public access ways will be constructed to prevent informal paths to the beach being created by residents and visitors. These pathways will be limited in number, positioned to avoid the loss of specimen plants within the vine thicket, and be of low impact construction. Construction will include sand ladders at the beach access points, and short sections of boardwalk through particularly vulnerable areas such as natural flow paths.

5.1.3 Acid Sulphate Soils

Several submissions raised the issue of acid sulphate soils (ASS) and requested further information on the location and extent of filling and excavation of lands below 5m AHD. An ASS Investigation Report and/or ASS Management Plan are also requested in accordance with State Planning Policy 2/02: *Planning and Managing Development Involving Acid Sulfate Soils*.

ASS are found in the intertidal zone and mangroves and potentially in the sands below the water table in land unit Qb1 on the northern side of Hummock Hill Island. ASS are likely to be disturbed around the existing causeway during the construction of the bridge to Hummock Hill Island and the



construction of a boat ramp located to the east of the bridge. The amount of disturbance is likely to be low and easily managed through a Potential Acid Sulphate Soil (PASS) Management Plan.

The PASS management plan will be prepared and implemented in accordance with the provisions of the SPP2/02 and the Queensland Acid Sulfate Soils Investigation Team (QASSIT) guidelines as discussed in Section 5.2.2 of the EIS and Section 17.4.4.2 of the Supplementary Report. Disturbance of soil above the threshold does not create an inconsistency with the SPP where an appropriate management plan is put in place as part of the relevant approvals process.

5.2 Mineral Resources

One submission raised the issue about the potential sterilisation of the mineral resource on Hummock Hill Island. In particular the submitter was concerned about transportation of materials through a residential area, buffer areas between residential areas and mining areas and the value assigned to the mineral sands in the EIS.

The Proponent has met with the EPM (Exploration Permit for Minerals) holder over an area of mineral sands on the western end of Hummock Hill Island. The Proponent has advised the EPM holder of the project and the plans for the development, that an EIS for the project was being prepared to obtain approval for the project to proceed and invited comment on the EIS. The EPM holder was also given a copy of the project Initial Advice Statement.

To date, the Proponent has not received a response from the EPM holder concerning the project and possible impact on the mineral sands deposit.

5.3 Landscape Character and Visual Amenity

5.3.1 *Impacts on Visual Amenity*

A number of submissions raised issues about the impact the HHI Development will have on the visual amenity of Hummock Hill Island and surrounding areas. Specifically, submitters were concerned that the EIS:

- did not provide sufficient detail with respect to visual amenity disturbance;
- provided limited analysis of impacts on views from the coastline and afar;
- did not provide adequate analysis of the impacts of the proposed bridge on the Great Barrier Reef World Heritage World Heritage Area;
- provided insufficient detail in relation to visual amenity issues associated with street lighting; and
- did not adequately assess the visual impact of the desalination plant.

The methodology adopted for undertaking the landscape character and visual impact assessment was described in Section 5.1.3, 5.1.4 and Appendix A7.6 of the EIS. The assessment was extensive and was consistent with Sections 3.1.1.6, 3.1.1.7, 3.1.2.5 and 3.1.2.6 of the HHI Development Terms of Reference and also the Significant Impact Guidelines (1.1) issued by DEH (2006).



The assessment included:

- existing landscape and visual environment analysis through:
 - description of the existing landscape character which provides a general description of the scenic values of Hummock Hill Island and the surrounding landscape;
 - classification of the landscape into landscape character units; the distinct areas that share common landscape features and characteristics;
 - description of the existing visual amenity of the broader landscape supported by photographs that illustrate existing outlooks from key viewing locations, a computer generated visual exposure analysis, and identification of sensitive visual receptors;
 - identification of valued landscapes. Reference has been made to the relevant planning framework and context which includes landscape and scenic values described for the Great Barrier Reef World Heritage Area, the State Coastal Management Plan (2002) and the Miriam Vale Planning Scheme; and
- assessment of the likely landscape and visual impacts through:
 - description of the sources of potential landscape and visual modifications associated with the HHI Development;
 - description of landscape and visual modifications for each identified landscape value having regard to criteria such as landscape sensitivity and the significance of likely impacts;
 - description of landscape and visual modifications for each of the identified sensitive receivers utilising where possible three-dimensional simulations; and
- description of proposed appropriate mitigation measures to avoid, reduce, remedy or offset negative visual impacts resulting from the HHI Development.

5.3.1.1 Coastal Views

Potential impacts to views from the coastline and further afield were specifically addressed in Section 5.1.4.1 and Table 5-24 of the EIS. The assessment found that overall the impact was considered to be slight to moderate, depending on the proximity of the sensitive receptor to Hummock Hill Island.

5.3.1.2 Bridge Impacts

The construction and operation of a bridge across Boyne Creek between the mainland and Hummock Hill Island is identified as a potential impact to visual amenity in Section 5.2.5.1 of the EIS.

Table 5-23 of the EIS identifies the impact of the bridge across Boyne creek as having a “high” magnitude of change in the landscape. The localised significance of the bridge affecting the visual amenity of “mangrove systems of exceptional beauty” could be considered to be large. However, the actual impact area is very small with limited viewpoints. The significant mangrove and tidal flat systems surrounding Hummock Hill Island will remain unaffected from the majority of viewpoints. No visual impact will be incurred by the GBRMP.



The tidal flows in this area have a large influence on the usability of the water for recreational fishing and boating (i.e. uses consistent with those within the GBRWHA) with particular difficulties finding a channel at low tide. This influences local receptor sensitivity which is more likely to be low to negligible. Given that the overall magnitude of the change is considered low, the local significance of the impact to the Great Barrier Reef is considered slight.

5.3.1.3 Lighting Impacts

Impacts associated with lighting during operation are addressed in Section 5.2.6 of the EIS and Section 13.8 of the Supplementary Report. Operational lighting will consist of permanent street lighting, building illumination, security lighting and pedestrian walkway lighting. It is expected that the phased nature of the proposed HHI Development will provide a gradual increase in artificial lighting density through the 16 year development period.

Initial artificial lighting will be associated with the cross Island boulevard (Clarks Road will not have street lighting) and headland area. Artificial lighting in the headland area in particular can impact marine turtles during the nesting season. This area will require specific design mitigation of lighting to minimise impacts to low density marine turtle nesting on the main beach of Hummock Hill Island as discussed in Section 15 of the EIS.

Mitigation objectives will be to eliminate or minimise diffuse lighting pollution outside required illuminated areas and maximise opportunities to utilise innovative and emerging solutions to public lighting impacts, such as emerging LED technologies. Achievement of these objectives will minimise adverse disturbance to both human and fauna receptors. All proposed external lighting will be required to comply with the relevant AS1158 (2005) standard. Specific mitigation measures are described in Section 5.2.6.2 of the EIS.

5.3.1.4 Desalination Plant

The visual impact of the desalination plant on the HHI Development will be minimal. The plant will be located in a screened area in a low lying part of Hummock Hill Island. Visual impact will be contained locally and the plant will not be visible from any locations external to Hummock Hill Island. Any potential impacts are proposed to be managed through a range of mitigation measures including but not limited to vegetation screening. In addition, as stated in Section 2.2.1 of the EIS, the design and visual appearance of buildings will be controlled by performance criteria contained in the approved Plan of Development for the HHI Development. Performance criteria may address design aspects such as building height, mass, site coverage and building materials to ensure that the design of buildings creates a strong identity both within precincts and throughout the community as a whole and creates a high standard of amenity and character.

The implementation of such mitigation measures will ensure any impact from the desalination plant will be minimal.

5.3.2 Mitigation Measures

One submission raised an issue about the proposed mitigation measures for potential impacts to landscape character and visual amenity described in the EIS. Specifically, the submitter was concerned that there was insufficient detail provided for the mitigation measures.



It is considered that the mitigation measures proposed are commensurate with the level of risk posed by the HHI Development. Section 5.2.5 of the EIS describes in detail the proposed mitigation measures including:

- bridge should be designed to achieve visual permeability. This means that the receptor should maintain some view of the landscape beyond the bridge;
- buildings and infrastructure including road cuttings should be sited below any prominent ridge line or hilltop so that there are no visible changes in the skyline;
- the location and design of access roads and driveways should conform to the landform and cause minimum visual impact or erosion hazard. Screen plantings on the sides of roads can mitigate any disturbance caused by initial loss of vegetation;
- the roof tops of buildings should not protrude above the canopy height of the surrounding vegetation;
- where the cladding of any part of a house (including the roof and rain water tanks) is proposed to be in metal sheet, this cladding be required to be colorbond or painted in muted tones to reduce reflection;
- where the wall cladding of a house is proposed to be in excess of 25% timber siding or fibre cement siding or metal sheet, the cladding can be required to be painted or stained in muted tones prior to occupation of the house or within a specified time thereafter;
- reflective factory finished metal sheets i.e. untreated galvanised sheet, aluminium, zincalume, or white, off white or silver paint finishes will not be permitted for roofs unless the slope of the roof is 10% or less;
- existing vegetation should be retained on site and selected clearing undertaken for building envelopes and public spaces;
- landscaped areas in public and private spaces planted using species that are native and occur locally on Hummock Hill Island;
- additional plantings can be undertaken including mature trees of a height above 10 metres increasing density and screening qualities of vegetation. A dense under storey can also be planted;
- restrict development on the elevated sections of the island and cluster development on the lower plains;
- limit development on the hills and slopes to single storey residences reducing vertical bulk and scale;
- limit development to two storey dwellings or 8.5 metres above natural ground level allowing a greater diversity of housing types and design options;
- all lights in buildings and in public spaces will be focussed on the areas required and where possible be equipped with motion sensor switches to minimise light duration;
- external lighting will be shielded to limit extraneous light where necessary or faced away from coastal and habitat areas;
- all external lighting of the site should conform to the following Australian standards:
 - AS 1158 - Road lighting; and



- AS 4282 - Control of the obtrusive effects of outdoor lighting.

5.4 Native Title

Several submissions raised issues in relation to Native Title issues including statutory obligations, native title rights, procedural rights and the need for native title notification.

Native title has been extinguished over the special lease area. Any development outside the special lease (ie bridge, boat ramps, walkway access to beaches) will be designated road reserve and public infrastructure and native title will be suppressed over these areas.

Multiple submissions raised concerns regarding potential impacts on native title areas within the HHI Development. One submitter specifically discussed a need to address the associated impacts of the link road to the Colosseum Inlet boat ramp.

Cultural Heritage values (including both indigenous and non-indigenous) can exist on an area regardless of the nature of land tenure. A Cultural Heritage Management Plan (CHMP) was accepted by DERM in January 2007. Construction works will be conducted in accordance with the requirements of the CHMP. Incorporation of recommended mitigation and management measures outlined in Section 13.4 of the EIS and in Appendix A7.10 (EIS) will manage impacts to areas of cultural heritage significance to acceptable levels.