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16. Health and Safety Hazard and Risk

16.1 Public Health

16.1.1 Vector Borne Disease Management

Two submissions claimed that the EIS did not provide sufficient detail about the management of mosquitoes and biting midges and that a Vector Management Plan (VMP) should be developed as part of the EIS.

The management of vectors such as mosquitoes and biting midges will be in accordance with the measures outlined in Section 14.3.16 and 20.4.4.2 of the EIS. The Proponent is committed to developing and implementing a VMP in accordance with the Queensland Health *Guidelines to minimise mosquito and biting midge problems in new development areas* (2002) and in consultation with Queensland Health and the Gladstone Regional Council as part of the construction and operation of the HHI Development. The VMP will address (at least) the following matters:

- breaks in any continuous vegetation lines leading to residential areas;
- roadway embankment construction should be designed to eliminate (if possible) any standing water impoundment or redirection of water flows into potential mosquito breeding areas;
- stormwater drainage should be designed to avoid silt accumulation and be free draining. Exit points from drains into waterways or wetlands should be designed to avoid habitat changes at discharge points;
- when planning landscapes in the HHI Development, consider appropriate strategies for shade creation for reducing ultra-violet exposure as well as keeping vegetation surrounding dwellings to a minimum for mosquito and midge management. Reducing vegetation around dwellings reduces insect harbouring areas and increases air flow surrounding the house. Also keep lawns well mowed as any activity that reduces sheltering sites and lowers humidity surrounding the house will help to deter mosquitoes and biting midges; and
- keep insect screens well maintained. If biting midge is a problem entering through fly screens, smaller mesh sizes such as found in products like "Solar Mesh" may stop entry. Screens can also be sprayed with insecticide barriers to deter midges. The newer lower toxic surface sprays containing synthetic pyrethroids can be very effective.

A relatively small proportion of the proposed HHI Development is located in an area which could receive insect pests during ideal conditions for dispersal from wetland habitats. Prevailing south-easterly winds could move insect pests into the near-coastal precincts of the HHI Development. No physical modification of biting insect habitat or chemical control is considered necessary or appropriate, given the sensitivity of receiving environments.

With regard to artificial waterbodies that will be created as part of the HHI Development, the colonisation by mosquitoes and biting midges can be managed by careful design. Specific

techniques will include designing batter slopes to ensure that isolated stagnant ponds are not created when water levels fall.

16.1.2 Water Supply

One submission claimed that the EIS did not provide sufficient information on public health risks associated with the independent water supply including rainwater tanks and greywater use. In particular, the submission wanted more information on the use of rainwater for potable purposes, the applications for greywater and recycled water, the design and operation of the desalination and wastewater treatment plants.

As discussed in **Appendix B4** the preferred water supply system for the proposed HHI Development is an integrated system comprising of:

- the provision of a potable (drinking) water supply from a desalination plant (or mainland supply if more appropriate);
- rainwater tanks on each property for capture of roof-water for internal, non-potable uses (eg laundry, hot water, shower, etc);
- reticulation of recycled water to households for toilet flushing and external irrigation;
- an on-site sewage and recycled water treatment plant; and
- a wet weather storage to balance recycled water production and demand.

It should be noted that rainwater is not intended for potable supply purposes.

The *Queensland Water Recycling Guidelines* (December 2005) nominate a range of appropriate uses for varying recycled water qualities. Within the urban context, Class A+ recycled water is required for reticulation to householders, and is considered suitable for toilet flushing and external uses (such as garden irrigation). The relevant quality criteria for various uses are outlined in Table 4.3 of Appendix A7.1 of the EIS. Note that due to the introduction of a new Water Supply Act (discussed below), the water quality requirements may have changed and should be reviewed prior to further progression of the design.

On July 1st, 2008 the *Water Supply (Safety and Reliability) Act 2008* (the Act) came into effect in Queensland, administered by the Queensland Department of Environment and Resource Management (DERM) (previously DNRW). The Act supersedes the previous *Queensland Water Recycling Guidelines*, December 2005 which were regulated by the EPA (now amalgamated with the DERM). The Act includes provisions for recycled water with the aim of:

- protecting public health
- for critical recycled water schemes, ensuring continuity of operation to meet essential water supply needs.

For schemes commencing supply after 1 July 2009 an approved Recycled Water Management Plan (RWMP) (or exemption) must be in place before supply of recycled water commences. A RWMP is a documented risk based system for managing production and supply of recycled water. The steps involved in preparation of a RWMP are:

1) Assemble Risk Assessment Team;
2) Document description the treatment system (including source water), uses, recycled water quality and levels of exposure;
3) Identify hazards and assess risks;
4) Determine Critical Control Points, Quality Control Points and control measures;
5) Establish critical limits for each control measure;
6) Establish monitoring, validation and verification programs; and
7) Prepare management procedures and corrective actions.

Steps 1-5 take a Hazard Analysis and Critical Control Points (HACCP) approach to the management of risks and will be undertaken during the detailed planning and design of the scheme. Validation and verification of the scheme are newer concepts and will need further discussion and liaison with DERM to determine the specific requirements for each scheme.

A supply of potable water is proposed to be provided from a desalination plant on Hummock Hill Island; however desalination is one of several possible options for supplying water. It is considered to be the most feasible option at this time. Further detailed analysis (including analysis of ocean impacts) will be required to confirm that this is the most suitable option. Several additional approvals (e.g. ERA) will also be required prior to construction of the plant, and these will require extensive studies and analysis to be completed. The process proposed in the EIS is a Mechanical Vapour Compression (MVC) Desalination Process (refer Section 3.4.1.4 of the EIS). It should be noted that this is one potentially viable technology, however a range of technologies will be considered during the detailed planning and design phases to ensure that the most appropriate technology is utilised.

The water provided by the desalination plant will meet the requirements of the Australian Drinking Water Guidelines. A comprehensive HACCP plan will be developed to ensure that any potential human health impacts are managed.

16.2 Hazard and Risk

16.2.1 Provision of Emergency Services

One submission was concerned that the absence of emergency services on Hummock Hill Island for the first three years was inadequate and posed a risk to public safety.

As discussed in Section 18.2.3.2 of the EIS, the general approach to emergency response on-site will involve:

- A team in the construction employees to provide a first response capability (e.g. occupational first aid and basic fire fighting) from the commencement of construction;
- For specialist emergency response services, the HHI Development will rely on the service provided by the local Queensland Police and Department of Community Safety officers stationed in Gladstone, Boyne Island, Calliope and Miriam Vale (i.e. via the 000 service) and once established the emergency services present on Hummock Hill Island;
- The emergency controller, who will be the on-duty operations team leader, will control and coordinate emergency response actions on site until such time as the incident is either effectively managed or handed over to external emergency services;
- Stores, restaurants, commercial premises and offices will be fitted with approved and certified fire detection (smoke detectors) and sprinkler systems;
- First aid fire fighting equipment (hand held extinguishers and fire hoses) will be installed at strategic points at the HHI Development;
- All fire fighting facilities and equipment will be serviced, maintained and inspected by a certified body;
- Site induction training will include emergency response actions;
- Fire drills will be undertaken on a regular basis where necessary by construction personnel;
- Permanent facilities, such as fuel storage areas, will have a dedicated fire alarm, suppression and fire fighting systems;
- Site fire fighting capabilities also will be addressed in the Emergency Response Plan; and
- The Principal Contractor will liaise with local State Emergency Services and local ambulance and hospital services with respect to planning for Emergency Response.

As discussed in Section 16.2.7.2 of the EIS planning for emergency services on Hummock Hill Island would be done in consultation with and to the satisfaction of the relevant emergency services providers including the Department of Community Safety, Queensland Police Service, and Surf Life Saving Queensland. Planning for emergency services facilities would ensure compatibility with longer-term plans of the relevant agencies and as identified by the DES the location and role of emergency services facilities will be determined subject to operational requirements and regional service plans.

16.2.2 Bushfire Risk and Management

Several submissions raised the issue that the EIS did not adequately consider bushfire risk and mitigation.

The EIS contained an assessment of bushfire risk in Section 18.2.3.4 of the EIS, and concluded that areas with a medium to high bush fire risk based on SPP 1/03 (such as the western slopes of the central ridge) are to be avoided or incorporate the designated cleared buffer distance required under SPP 1/03.

Submissions have noted that the bushfire risk across Hummock Hill Island is extreme, however, this is an overly simplistic view and, for many areas simply inaccurate. Using the methodology set out in the SPP 1/03 Guideline, risk varies from medium to high across HHI Development area.

The Bushfire Risk Analysis Map Overlay defines risk at a strategic level and highlights the need for the detailed assessment to be undertaken. Following this detailed assessment, areas identified as Natural Hazards under the SPP 1/03 will be required to meet the requirements set out in the SPP (Section A.4.6).

Section A.4.6 of Annex 4 of SPP 1/03 outlines the requirements for development within a Natural Hazard Area, as follows:

- Avoiding areas of High or Medium bushfire hazard; or
- Mitigating the risk through:
  -Allotment design and the siting of buildings; and
- Including firebreaks that provide adequate:
  -Setbacks between buildings/structures and hazardous vegetation, and
  -Access for fire-fighting/other emergency vehicles;
- Providing adequate road access for fire-fighting/other emergency vehicles and safe evacuation; and
- Providing an adequate and accessible water supply for firefighting purposes.

Based on the strategic bushfire risk assessment the Proponent has already committed to either avoiding or incorporating the designated cleared buffer distance required under SPP1/03 for areas identified as having medium to high bushfire risk.

A firebreak (incorporating a managed fire trail) of at least 30 m will be maintained around the entire perimeter of the HHI Development area. This will provide a substantial physical barrier and access for fire fighting purposes.

Any substantial patches of vegetation which remain within the HHI Development matrix will either be buffered from development or subject to fuel control, including the establishment of fuel free and fuel reduced zones.

One submission requested clarification about the statement in Table 7.6 of the EIS that the HHI Development will be designed to incorporate measures to meet Specific Outcomes 6 and 7 in SPP 1/03.

The reference to Outcome 7 of the SPP1/03 was in error and it should have read Outcomes 1, 2, and 6 as well as Appendix 7. Section 2.1.2.3 of the EIS identifies the relevant Outcomes 1 and2 of SPP 1/03.

16.2.3 Storm Surge

Two submissions suggested that inundation modelling should factor in predictions for sea-level rise and subsequent increased storm surge occurrence. The issue of Storm Tide Flooding was specifically considered in Section 9.2.5.1 (potential impact) and Section 9.3.1.3 of the EIS.

Areas between 3.3 m and 3.6 m AHD are considered to have a low storm tide severity as defined in the *State Coastal Management Plan Guideline – Mitigating the Adverse Impacts of Storm Tide Inundation* (2006).

All development behind the current erosion prone areas such as the Bay Zone is not considered to be significantly impacted by potential storm surge for up to a 100 year event. It is proposed that some filling, using sand material derive from excavation of the lagoons, will be conducted to provide an additional safety factor in areas that are in the 3.3 m to 3.6 m AHD range. Reference to the Miriam Vale Shire Planning Scheme Policy No. 1 requires building floor levels to be 0.4 m above the storm surge level of 2.5m, i.e. 2.9m AHD. Whilst this figure does not agree with the reported 100 year storm surge levels of CES, building floor levels will be constructed 0.4 m above the RL+3.3 m to RL+3.6 m AHD to ensure protection from such events and ensure future sustainability of these areas.

Placement of fill will be limited to areas within the Bay Zone and a relatively small area of the Lagoon Zone that fall under the above AHD heights. South of this are elevation increases to 5 m – 7m AHD and is not at risk from storm surge. The design levels are not considered to present a serious impediment or constraint on the future development of this area (CES, 2005).