REPORT FOR THE ESTABLISHMENT OF A COASTAL SETBACK LINE FOR THE TONGAAT HULETT DEVELOPMENT PROPERTIES: TINLEY MANOR TO THE TUGELA RIVER MOUTH, KWAZULU-NATAL - PHASE TWO.

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For

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1. SCOPE OF WORK

Tongaat Hulett Developments (THD) wishes to complete a coastal setback line analysis of its land holdings from Tinley Manor to the Tugela river mouth along the KwaZulu-Natal coastline. In phase one an assessment of this land was undertaken but a coastal setback line was not finalized. In this report the determination of two coastal set back lines are undertaken. A physical process or coastal hazard line based on the physical processes at each location and a limited development set back line based on current environmental assets.

2. APPROACH TO MODELING COASTAL SET BACK LINES

The approach taken in this report is similar to the current approach being taken at a national level. The process involves 5 separate steps. The first four steps result in the determination of the physical processes or coastal hazard line. The subsequent remaining step result in the determination of the limited set back line.

Step 1

Calculate the wave run up position along the coast based on a chosen offshore wave height and return period. This work was done in phase one and an offshore 1:10 year wave height of 7,1m was combined with three scenario's of sea level rise, namely 300mm, 600mm and 1000m. For this step a sea level rise scenario of 1m was adopted.

Step 2

The erosion of the coast allows for overstep land to slip seaward and the toe is undercut. This slip failure analysis was undertaken as part of phase 1 and so wherever this slip failure lies inland of the wave run up calculated in Step 1 then the slip failure line will take preceedance.

Step 3

The coastline erodes during storm events and the effect is to move the wave run up level (calculated in step 1) inland. In order to assess this factor a long historical record of storm erosion data is required. This can also be modeled using a storm erosion model such as

SBEACH but these models needs to be calibrated with data. In this case no data exists and so an estimate of likely storm erosion has to be made based on experience and a consideration of the beach, wave, storm duration and sediment characteristics at the location. In this study an allowance of 20m of shoreline retreat has been chosen to reflect a typical short term storm erosion buffer.

Step 4

The next step involves determining the long term erosional trends of the shoreline. If the coast is retreating then an allowance equal to 100 years at the calculate rate of retreat is factored in. Dynamically stable or accreting shorelines are normally deemed to be stable and no allowance is made for the long term changes. In this case no long term trend was included given that these areas are relatively stable.

OUTPUT 1: PHYSICAL PROCESSES/ COASTAL HAZARD LINE

Step 5

This step looks at the environmental assets along the coast. Typically these are the estuaries and the coastal forest, grasslands, etc. The estuarine areas were defined in the previous study and so the outer edge of the estuary was taken as the edge of the limited set back line. The areas between the estuaries were looked at from an environmental viewpoint and all important coastal habitats were included sea ward of the limited development line.

OUTPUT 2: LIMITED DEVELOPMENT LINE

These two lines are shown as an example in Figure 1.

Figure 1: Typical example of a hazard line and a limited development line in the study area

3. DELIVERABLES

The main deliverables of this phase of this project is an electronic GIS shape file showing the 2 coastal setback lines and a short specialist report detailing the findings of this work (this report).

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