

## MEMORANDUM: ECOLOGICAL SIGNIFICANCE OF LANDWARD SAMPHIRE COMMUNITIES AT MARDIE

### Purpose

The purpose of this review is to examine the local significance of the landward samphire communities at Mardie, of which it is proposed to disturb up to 854 ha of a total mapped extent of 1,128 ha (76%).

The significance of this impact relates directly to the significance of the vegetation communities. EPA Guidance Statement No. 51 (EPA, 2004) has been used to derive the criteria used to assess the significance of the vegetation, namely:

- statutory listing (TEC) or other listing (PEC)
- extent is below a threshold level
- scarcity
- unusual species
- novel combinations of species
- a role as a refuge
- a role as a key habitat for threatened species or large populations representing a significant proportion of the local to regional total population of a species
- being representative of the range of a unit (particularly, a good local and/or regional example of a unit in 'prime' habitat, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range)
- a restricted distribution.

### Description of vegetation community

The landward samphire communities (including TtSvTc) contain the following survey sites (Phoenix 2020): MS035, MS30, MSP236, MSP116Q1, MSP60AQ1, MSP116Q3, MSP116Q4, MSP211, MSP60AQ2, MSP60AQ3, MSP022Q2, MSP022Q3, MSP022Q4, MSP218, MSP231.

The species and cover recorded at each survey site have been catalogued in the attached Excel spreadsheet.

### Ecological significance considerations

1. *Do the landward samphire communities support rare or restricted species, or range extensions?*
  - No threatened or priority flora recorded in any of the survey sites
  - Two unidentifiable *Tecticornia* spp (*Tecticornia* sp. affinity to *T. halocnemoides* LOSA and *Tecticornia* sp. sterile 1) were recorded in the landward communities but are also present and in higher numbers in the seaward communities
  - 1 *Tecticornia* found only in the landward communities (*Tecticornia indica* subsp. *bidens*); all other *Tecticornia* species are found in both types or are restricted to the seaward communities.
  - *T. indica* subsp. *bidens* has an extremely widespread distribution across 17 IBRA regions
  - Other native plant species restricted to the landward samphire communities were:

*Dactyloctenium radulans*  
*Gomphrena canescens*  
*Lawrenia viridigrisea*  
*Pluchea rubelliflora*  
*Pterocaulon sphacelatum*  
*Sclerolaena costata*  
*Streptoglossa adscendens*  
*Streptoglossa bubakii*  
*Trianthema cusackianum* (western-most record)  
*Triodia epactia*

*Triodia longiceps*  
*Vachellia farnesiana*

All species were recorded at multiple sites in other terrestrial vegetation communities at Mardie and none are classified as threatened or appear to have restricted distribution at a bioregional level.

- *Trianthema cusackianum* appears the western-most record of this species but most of the sites in which it is recorded are located above the intertidal area and outside of the Development Envelope.
2. *Are the landward samphire communities unique in terms of their assemblage?*
    - The landward samphire communities have a low species diversity (average of 6 species/site) and appear to be more defined by absence of some key species common to the seaward communities (e.g. *Muellerolimon salicorniaceum*) or by the widespread presence of dryland species, such as *Eragrostis falcata*.
    - The dendrogram in Phoenix does not indicate strong clustering across the survey sites listed above, except for sites located as part of a transect (eg MSP022Q2-4).
  3. *Are the landward samphire communities important for the survival of a species/population?*
    - Phoenix did not identify any species specifically utilising these areas, including migratory shorebirds
  4. *Are there other examples of this community sub-type outside of the study area/impact site?*
    - Figure 69 of the ERD (provided in Figure 1 below) showed regional mapping conducted by Stantec. The landward samphires were not a target of this survey, however it does provide some context of the presence of similar BCH zonation in the region. Both north and south of the Proposal there are similar areas of mudflats, which would be expected to have similar landward samphire communities on the eastern fringe. There is evidence of this in aerial photos from Google Earth; Figures 2 and 3 are from the eastern side of the mudflats south and north of the Proposal respectively (coordinates are on the photos). The landward samphire communities within the Proposal are therefore not the only representation of this vegetation type in the region.
    - Vegetation mapping at Cape Preston by AECOM (2009) classified and mapped local community types Ls1: *Tecticornia halocnemoides* subsp. *tenuis* Open Samphire Herbland over brown clayey loam and Ls2: *Tecticornia halocnemoides* Samphire Herbland on brown clay (1081 ha mapped).
    - At Mardie (30 km to the southwest), *T. halocnemoides* subsp. *tenuis* was the dominant T taxa in the landward communities and was almost totally absent from the seaward communities. LS1 also has a very low diversity and cover, and occupies a very similar position in the landscape. LS1 also supports *T indica* subsp. *bidens*, further strengthening the argument that this is the same community type

## Conclusion

The EPA (2002) significance criteria for vegetation communities and their application to the landward samphire vegetation communities (considered as a whole) are summarised below.

| Significance Criterion   | Assessment Advice   |
|--------------------------|---|
| Listing status           | Not listed and does not share similarities with the descriptions of any listed TEC or PEC.  |
| Extent remaining         | The proposal will place the known remaining extent of the vegetation type below the EPA (2000) threshold value of 30%; however it is highly likely that other examples exist, including at Cape Preston, 33 km to the north (the existing community extends 25 km across the project study area). Mardie Minerals will commit to identifying and mapping additional examples of the landward samphire community prior to impacting that community on a large scale (when the ponds are filled). |
| Scarcity                 | Refer to 'Restricted distribution' criterion.   |
| Contains unusual species | The assemblage does not contain unusual species   |

| Significance Criterion   | Assessment Advice  |
|--|--|
| Contains novel combinations of species   | The assemblage contains plant taxa that are relatively widespread across the regions. Diversity is very low (average of 6 sp per site).  |
| Has a role as a refuge   | The assemblage contains plant taxa that are relatively widespread across the regions. Phoenix did not identify and fauna species reliant on the vegetation community.  |
| Has a role as a key habitat for threatened species or large populations representing a significant proportion of the local to regional total population of a species   | Not listed and does not share similarities with the descriptions of any listed TEC or PEC. The assemblage contains plant taxa that are relatively widespread across the regions.<br><br>No threatened or locally abundant fauna species were recorded in the vegetation community. It has a relatively low level of use by migratory shorebirds when compared to the seaward samphire communities. |
| Is a representative of the range of a unit (particularly, a good local and/or regional example of a unit in 'prime' habitat, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range) | There is insufficient regional vegetation mapping to address this criterion.   |
| Has a restricted distribution  | The mapped extent of the landward samphire community is restricted to the project survey area. Other examples are considered to exist to the north and south with a high level of confidence based on other mapping programs. This will be confirmed by additional regional mapping prior to large-scale disturbance of this community type.   |

### References

- Aecom Australia Pty Ltd (2009). *Balmoral North and Balmoral South Stage 2 Flora and Vegetation Assessment*. Unpublished report prepared for Mineralogy Pty Ltd 7 May 2009.
- Environmental Protection Authority (EPA) (2000). *Position Statement No. 2: Environmental Protection of Native Vegetation in Western Australia*.
- Environmental Protection Authority (EPA) (2004). *Assessment Guidance No. 51. Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia*

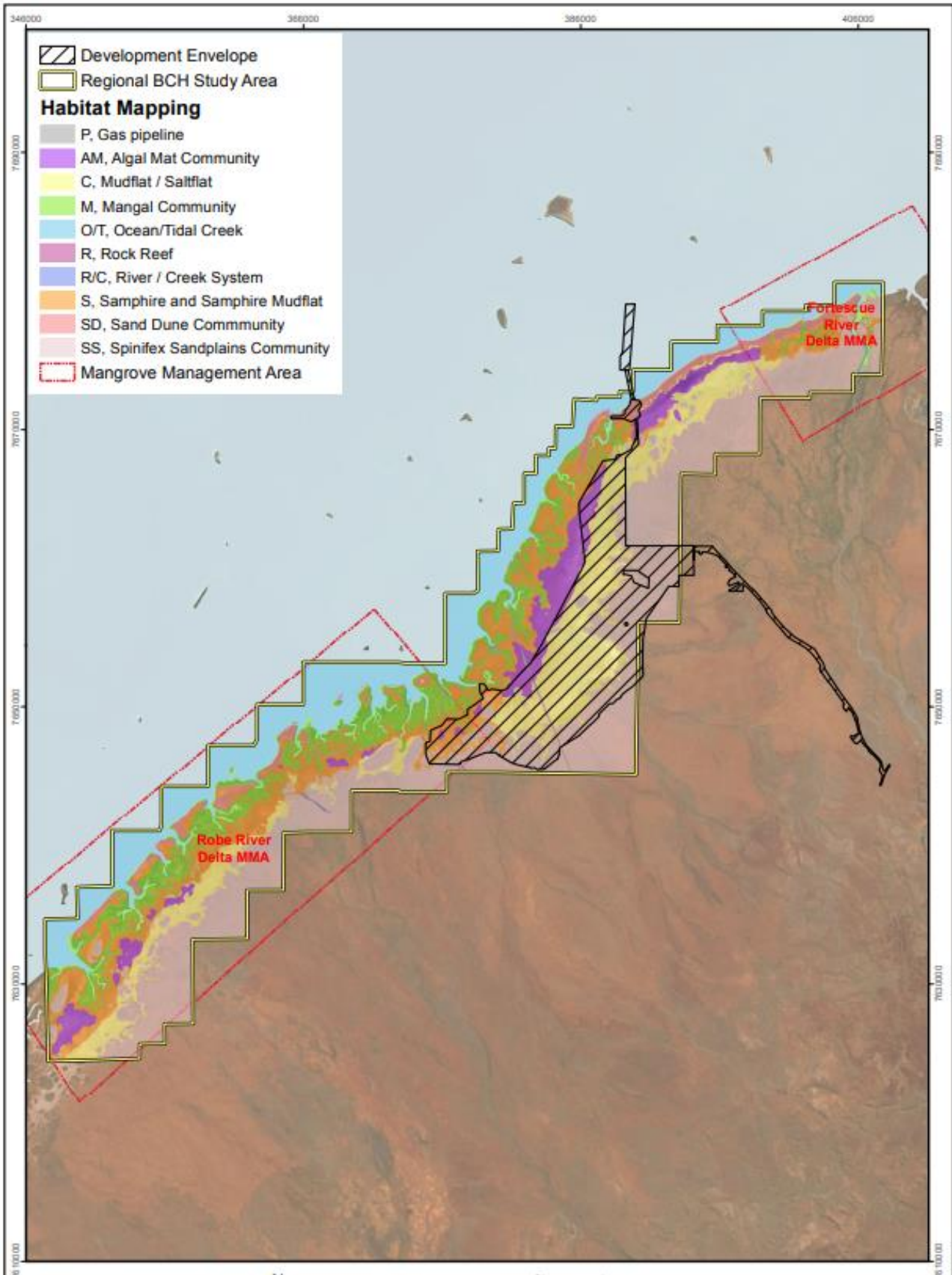
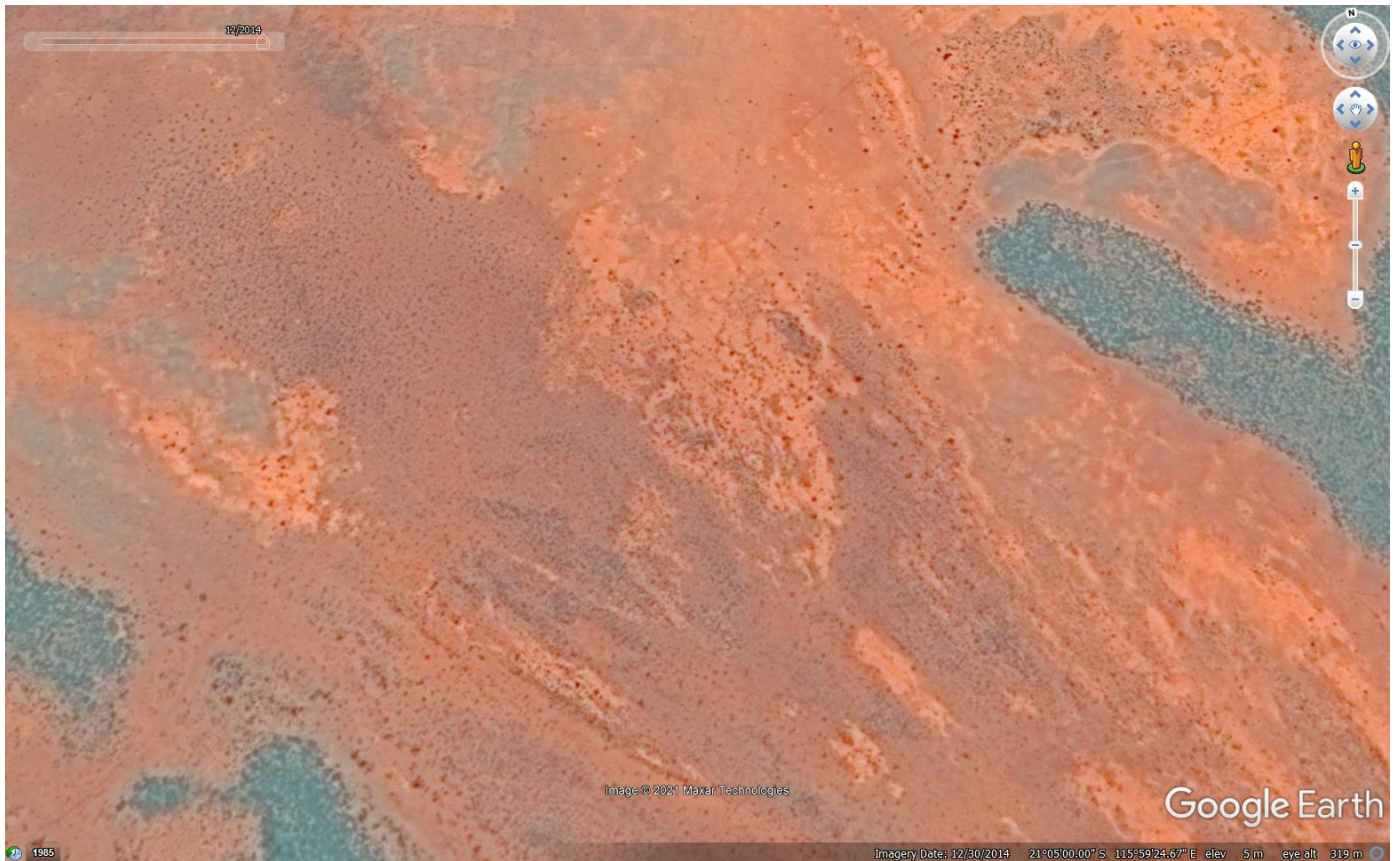


Figure 1: Stantec regional BCH mapping



**Figure 2: Example of landward samphire communities on the eastern side of the mudflats south of the Proposal**



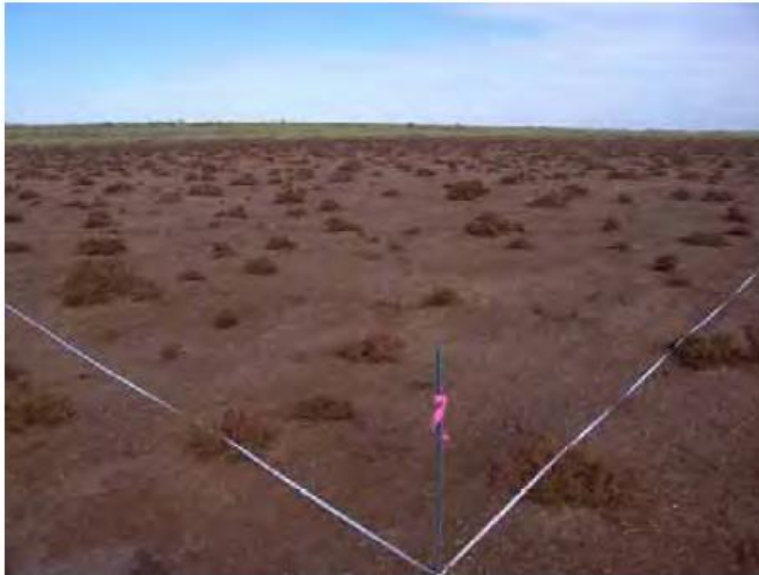
**Figure 3: Example of landward samphire communities on the eastern side of the mudflats north of the Proposal**

**Balmoral North & South**
**Area 2 (M0800118 – M08000122)**
**Site BN10**
**Date** 27/09/2008 **Type** Q 50 X 50

**MGA Zone** 50 411362mE 7675691mN

**Soil** Brown clay loam

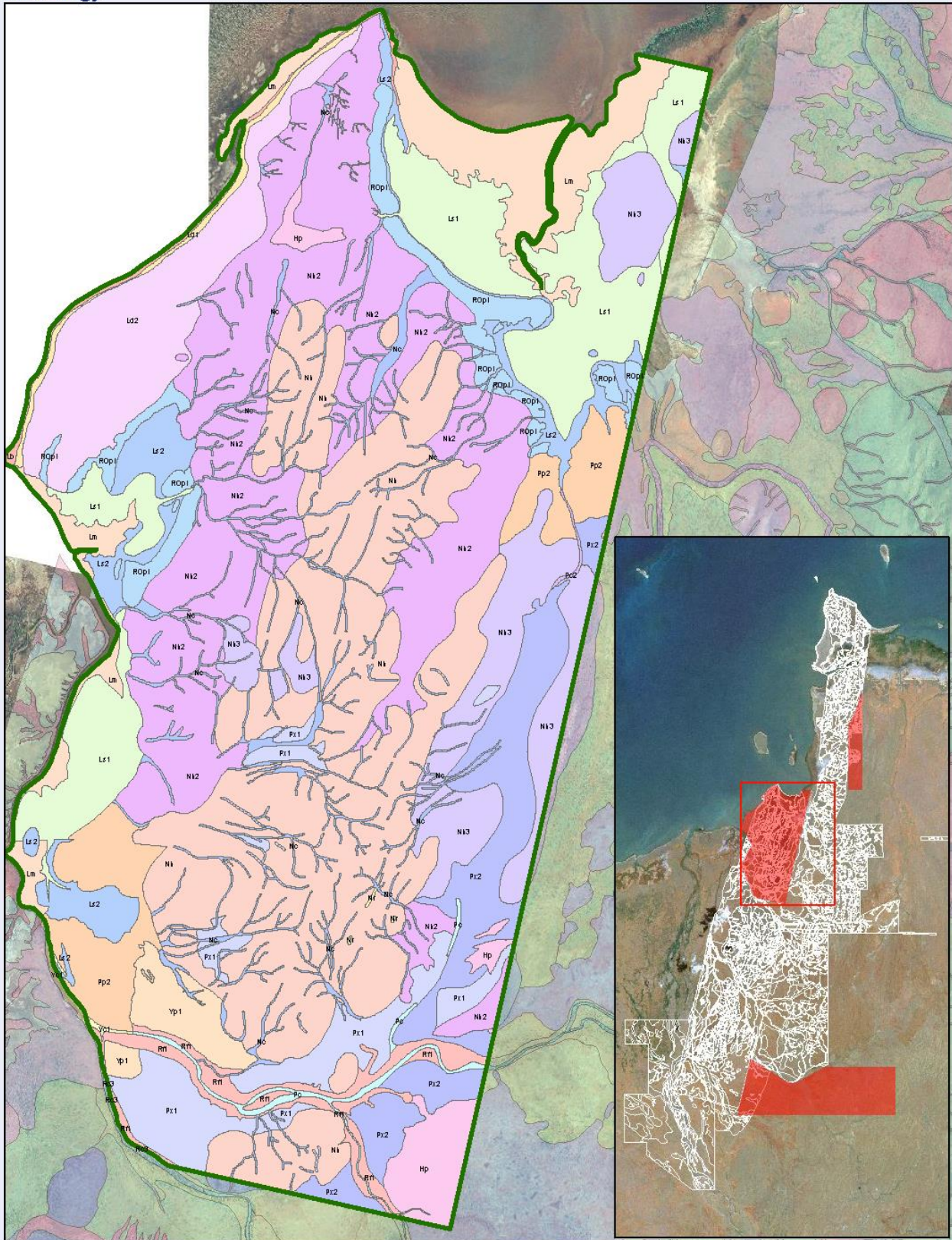
**Vegetation** Ls1 - *Tecticornia halocnemoides* subsp. *tenuis* Open Samphire Herbland over brown clayey loam.

**Condition** Good

**SPECIES LIST:**

| Quadrat Name   | Cover | Height | Specimen Notes |
|--|-------|--------|----------------|
| <i>Tecticornia halocnemoides</i>                           | <1    | 0.15   | BN86           |
| <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>      | 15    | 0.3    | BN84           |
| <i>Tecticornia indica</i> subsp. <i>bidens</i>             | <1    | 0.15   | BN83           |
| <i>Tecticornia pterygosperma</i> subsp. <i>denticulata</i> | <1    | 0.1    | BN85           |

**Figure 4:** An example of site vegetation type Ls1 *Tecticornia halocnemoides* subsp. *tenuis* Open Samphire Herbland over brown clayey loam.

**Mineralogy**



**Figure 5: Vegetation communities classified and mapped for the Mineralogy Cape Preston proposal (Aecom, 2009), including the LS1 (light green) and LS2 (pale blue) communities that share significant similarities to the landward samphire community at Mardie.**