



## Chinderah Bypass - Hydraulic Placement of Sand

Principal: Road & Traffic Authority NSW

Location: Tweed Heads, NSW

### Introduction

It takes time to adapt to new regulations and methodologies; however, the Chinderah Bypass contract saw Neumann Contractors placed in a situation that required experience that was yet to be gained. No precedence had been set, so a sharp learning curve was essential.

The Chinderah Bypass was a technically complex project that required a combination of best management practices and the conception of new industry practices to achieve the desired end. Modifying the original concept during the construction phase through systematic scientific research and a touch of entrepreneurship has seen a potential environmental nightmare turned around to benefit both the contractor and the community.

Despite the difficulties faced during the project, Neumann Contractors completed the contract to the clients' requirements on time and within budget. A success worthy of winning the 1997 National Case Earth Award for demonstrating a commitment to innovation and best practice in the field of environmental in civil construction.

Environmental Impact Studies (EIS) had concluded that increasing the waterway by removing sand would reduce the risk of flooding of adjacent low lying developed areas. Therefore the dredging of the River was part of a longer-term plan for the Chinderah Bypass area.

The dredging operation was to be conducted with strict control as the road traversed over 800m of tidal wetland, crossing three large tidal drains and areas that were considered environmentally sensitive.

To further complicate the situation, prior testing had revealed that existing soils in the road corridor had recorded a significant Acid Sulphate Potential.



## Chinderah Bypass – Hydraulic Placement of Sand (continued)

### Scope of Work:

The scope of works included:

- Importation by dredge of approximately 700,000m<sup>3</sup> of fill,
- Dredging of alluvial sand from the Tweed River directly to the road corridor,
- Pollution mitigation measures relating to sand pumping operations,
- Containment and treatment of dredge tailwater to meet EPA standards,
- Containment and disposal of Acid Sulphate dredge residue.

### Challenges

The dredging operation was to be conducted with strict control as the road traversed over 800m of tidal wetland, crossing three large tidal drains and the following areas that were considered environmentally sensitive:

- Two separate coastal wetlands, including an area of mangroves,
- A coastal dune area, and
- The only remaining section of rainforest in the district contained a stand of endangered trees.

### Innovation

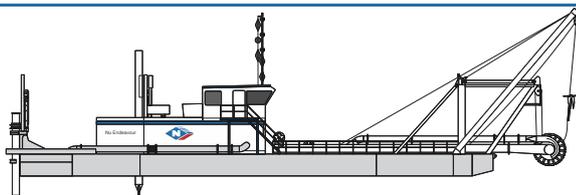
There were many environmental challenges on the Chinderah Bypass; some of the methods for overcoming these were:

- During the dredging process, the sand and silts separated within the slurry. At the dredge head, the sand separates, allowing the tailwater containing the acid sulphate silt to run to the lowest point. A secondary pumping system had been established to pump the tailwater and fines to a temporary sedimentation pond and treatment facility.
- A water treatment facility with a 132,000m<sup>3</sup> capacity was constructed on thirty-two hectares of land adjacent to the road's corridor leased from a sugarcane farmer.
- The final 75,000m<sup>3</sup> of topsoil product was sold on the Gold Coast and won several prominent supporters amongst the landscape industry

### Outcome

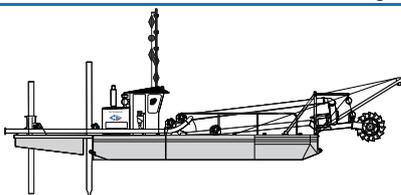
The Chinderah Bypass project was a great success for all those involved and became a valuable building block in the future treatment and management of acid sulphate soils. Neumann's soil treatment has been the topic of several scientific publications, including the National Conference on Acid Sulphate Soil. Throughout the contract, interested visitors to the site included:

- ASSMAC Committee,
- Department of Agriculture,
- Department of Natural Resources,
- Queensland and NSW Acid Sulphate Committees,
- Federal Airports Commission,
- Tweed Shire Council, and
- Gold Coast City Council.



Nu Endeavour Cutter Suction Dredge

Length:.....34.78m  
 Nominal Production Rate:..... 650m<sup>3</sup>/hr  
 Total Power/Power at Pump: .. 1,454/1,044kW (1,950/1400 hp)  
 Pipeline Diameter: ..... 450 mm  
 Maximum Digging Depth:.....15 metres  
 Gross Weight: ..... 220 Tonnes



Nu Enterprise Cutter Suction Dredge

Length:..... 12.0m (18.0m LOA)  
 Nominal Production Rate:.....125m<sup>3</sup>/hr  
 Total Power/Power at Pump: ..... 216/172kw (290/230 hp)  
 Pipeline Diameter: .....250 mm  
 Maximum Digging Depth:.....7.5 metres  
 Gross Weight: ..... 32 Tonnes