

# PORT OF NEWCASTLE, NSW, AUSTRALIA - MAINTENANCE DREDGING AND UNCONFINED SEA DISPOSAL OF DREDGE MATERIAL

Greg Britton, Royal HaskoningDHV, [greg.britton@rhdhv.com](mailto:greg.britton@rhdhv.com)  
Ali Watters, Royal HaskoningDHV, [ali.watters@rhdhv.com](mailto:ali.watters@rhdhv.com)

## INTRODUCTION

The Port of Newcastle is the largest port on the East Coast of Australia and the world's largest coal export port. It currently handles 4,700 ship movements and 166 million tonnes of cargo annually. The trade is worth \$37 billion to the national economy annually.

The port is located on the Hunter River, a major river in NSW having a catchment area of approximately 37,000km<sup>2</sup> and a length of approximately 460km. The river is subject to freshwater flows and major flooding which introduce fluvial sediments to the port. Marine sediments are also introduced into the port entrance area by coastal processes.

Continual maintenance dredging is required within the port to ensure safe navigation. It is fundamental to the continued operation and viability of the port. Dredging commenced in the port in 1859 and has been virtually continuous since that time. Maintenance dredging is carried out by a trailing suction hopper dredger (TSHD), the 'David Allan', which is owned and operated by the Port of Newcastle (Figure 1).



Figure 1 - The David Allan trailing suction hopper dredger

The majority of the maintenance dredge material is placed offshore in an established dredge material ground (DMG) located in 25 to 30m water depth. Maintenance dredge material having a low fines content (less than 10% by weight) is placed offshore from an adjacent beach (Stockton Beach) for purposes of beach nourishment to address erosion issues.

Placement of maintenance dredge material at the DMG is regulated by the Australian Government under a 10 year maintenance dredging permit, the first of its kind issued in Australia. The 10 year permit volume is approximately 8 million m<sup>3</sup>. The permit is underpinned by a Long Term Monitoring and Management Plan (LTMMMP).

Placement of the sandy textured material off Stockton Beach is regulated by the NSW Government. Annual average volumes are approximately 25,000m<sup>3</sup> per year.

The DMG is dispersive, meaning that not all of the maintenance dredge material placed at the DMG is retained at the site. Substantial quantities are mobilised and transported away from the DMG by ocean waves and currents. Knowledge of the fate of this material is a central issue in the assessment of the environmental impacts of the maintenance dredging and unconfined sea disposal of the dredge material.

## OUTLINE OF PAPER

The Paper would outline the following:

- brief overview of the significance of the Port of Newcastle to the local, State and National economies
- the history of maintenance dredging
- the statutory and legislative framework for maintenance dredging
- the characterisation of the maintenance dredge material, physically and geochemically
- the methods of dredging and dredge material disposal considered in the LTMMMP
- the physical sediment processes operating at the DMG and in the far field (Figure 2)
- the environmental impacts of the disposal of dredge material at the DMG, in particular the fate of the material and the methodologies used to determine this fate, including a simple but very powerful approach of using the characteristics of the dredge material as tracers
- the environmental impacts of the disposal of dredge material off Stockton Beach for purposes of beach nourishment

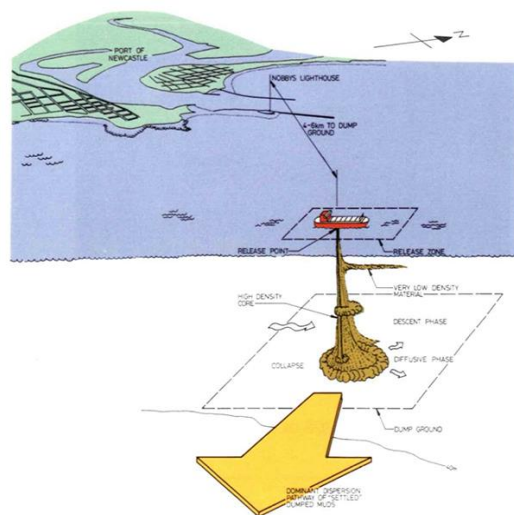


Figure 2 - Sediment processes at the DMG