

PORT BOTANY CONTAINER TERMINAL EXPANSION PROJECT

Questions & Answers

Dredging and Reclamation Work

Q. What is dredging and reclamation?

A. Dredging is the term given to digging, gathering, or pulling out material to deepen waterways, create harbours, channels, locks, docks and berths, and keep approaches to boat ramps clear. The material removed during dredging can vary greatly and can be any combination of rocks, clays, silts or sands.

Reclamation for this project involves the use of dredged sands to provide material that will form the land mass for the new container terminal and new recreational boat ramp and for the reshaping of Penrhyn Estuary.

Q. Why is dredging taking place?

A. The dredging provides for the deepening of the port to allow access by container vessels to the new facility, to create a recreational boating channel from the new recreational boat ramp to the wider Bay and to provide materials for the reclamation of the new terminal area and the new recreational boat ramp.

Q. When will dredging works commence?

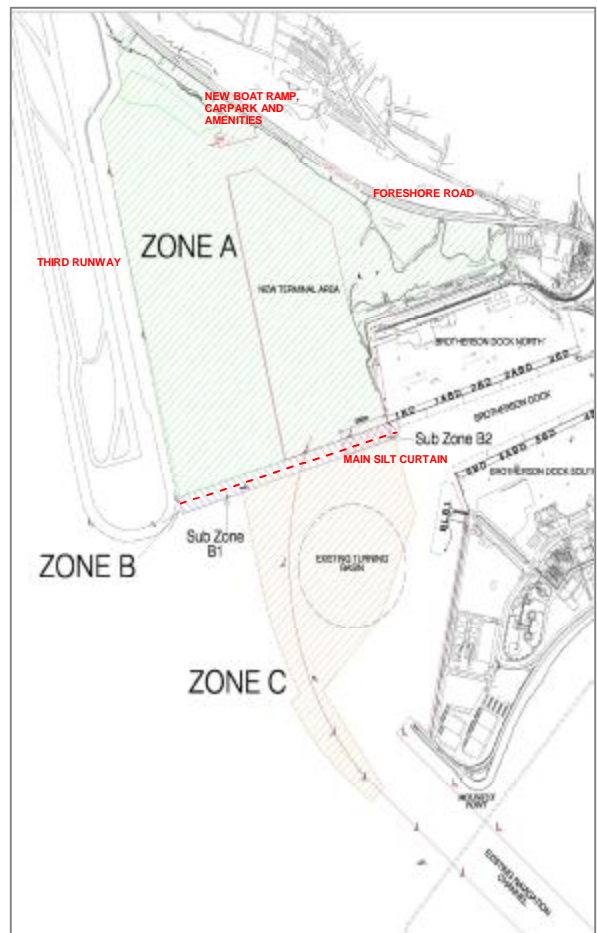
A. Dredging works commenced in September 2008 and will continue until March 2010. The container terminal works is is scheduled for

completion in early 2011. The dredging vessels are operational 24 hours a day for 7 days a week.

Q. Where is the dredging taking place?

A. The Marine Works Area is shown in Figure 1 and comprises of three zones - A, B and C as shown. Dredging occurs within defined areas of each zone.

Figure 1: Marine Works Area



Q. What machinery is used on this Project for dredging?

A. There are two types of dredger being used on this project. A 'cutter suction dredger' and a 'trailing suction hopper dredger'. A total of four dredgers will be in operation on the Project at set times within the programme (refer Figures 3, 4, 5 and 6).

A 'cutter suction dredge' is a stationary dredge. The cutter head loosens the soil under water and the water and soil mixture is then pumped via pipelines to the discharge location. At the reclamation, the water runs off and the soil remains in place.

An image illustrating how the cutter suction dredger works is shown in Figure 2.

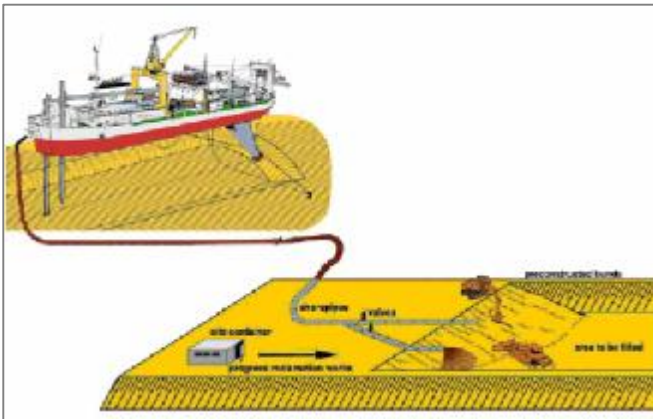


Figure 2: Methodology of dredging for bulk work. Utilising a cutter suction dredge

A trailing suction hopper dredger (TSHD) trails its suction pipe when working, and loads the sand into the hopper in the vessel. When the hopper is full, it sails to the reclamation area, and places the material by splitting open over the complete length of the vessel.

The 'Nu Bounty' arrived on site in August 2008



Figure 3: Cutter Suction Dredge Nu Bounty and departed in February 2009 (Figure 3). The 'Leonardo Da Vinci' (Figure 4) arrived in February 2009 departed in April 2009. The 'De Bougainville' (Figure 5) will arrive in June 2009 and will leave in approximately August 2009. The 'Marco Polo' (Figure 6) will arrive in approximately August 2009 and will remain until the completion of dredging, being approximately March 2010.



Figure 4: Cutter Suction Dredge Leonardo Da Vinci



Figure 5: Trailing Suction Hopper Dredge De Bougainville



Figure 6: Cutter Suction Dredge Marco Polo

Q. How deep do you dredge? How much sand is dredged?

- A. The final bed level after dredging will be a minimum of 16.5 metres alongside the new terminal and 15.5 metres in the ship turning basin. Some isolated locations could be up to 23 metres deep.

A total of approximately 8 million cubic metres of sand will be dredged.

Q. Where will dredged material be sent?

- A. Dredged sand will be used to create the additional 63 hectare area for the new terminal, the new recreational boat ramp and to enhance Penrhyn Estuary.

Sand material from the cutter suction dredge will be pumped by pipeline to the reclamation area and spread out using bulldozers or the 'spreader pontoon DN10' (see Figure 7) for the creation of the new terminal area and the new recreational boat ramp. Materials deemed not suitable for

reclamation will be placed back into the selected dredged areas by the 'spreader pontoon'.

The 'De Bougainville' will be trimming the overflow of the trench, taking away the sands and removing high spots in the turning basin and access channel. Unlike a cutter suction dredge, the trailing cutter suction dredge does not need a spreader pontoon as dredged materials are deposited directly from the on board hopper.




Figure 7: Spreader Pontoon DN10

Q. What is the environmental impact of dredging and reclamation?

- A. All dredging and reclamation activities involve short term effects such as turbidity and plumes or cloudy water. Localised turbidity (suspended sediment) will be generated by both dredging and reclamation activities. Turbidity plumes are common in the active work area during dredging activities.

To minimise the spread of turbidity and potential impacts on sensitive areas, such as the seagrass, silt curtains are being used. The main silt curtain is located between Brotherson Dock and the third



runway at Sydney Airport and will control turbidity entering the main part of Botany Bay (see Figure 1). This silt curtain has a permanent gate for recreational vessels for access to and from Botany Bay and a separate temporary gate for construction vessels to pass through. A second silt curtain is placed around the seagrass that adjoins Foreshore Beach.

Some turbidity is allowed outside the primary silt curtain--but it must meet stringent NSW Department of Environment and Climate Change criteria for total suspended solids (TSS). If any turbidity outside the silt curtain exceeds these criteria--the work must stop immediately until acceptable turbidity levels are achieved.

Temporary silt curtains will also be deployed around work areas as required for additional protection.

Routine weekly and monthly water quality monitoring is being undertaken at nine locations around the project site to identify any impacts to Botany Bay and Penrhyn Estuary. Water is being tested for physical parameters such as temperature, pH, salinity, and dissolved oxygen, as well as for total suspended solids (TSS), nutrients, chlorophyll, organics and heavy metals in some areas.

Monthly environmental monitoring reports will be available on the website.

A separate fact sheet on Turbidity and the Monitoring of Dredged Material is available by contacting the Project.

Q. Will there be any impact on air quality?


- A. To avoid potential spread of dust and sand to the airport and other neighbouring sites, geotextile screens of about 30cm high on wooden poles will be erected at regular intervals on reclaimed areas and stockpiles. The dredged material will be wet when extracted from the bay and placed into the reclamation areas. This will help control and minimise wind-blown sand and dust.

If required, additional dust controls and mitigation measures will be implemented during periods of high winds. This could include the application of a thin bitumen cover, applying additional water or sprinkler systems, seeding the exposed areas with grass or the installation of dust or sand drift fences.

Q. How much noise will the dredging machinery make?

- A. Noise modelling indicates that that there will be minimal noise impacts on residents as a result of dredging and reclamation. This modelling will be verified during construction. Monitoring of noise levels will be conducted during the day and at night on a monthly basis throughout the construction period.

It is thought that the trailing suction hopper dredge will be more efficient in terms of noise than the cutter suction dredge.



Q. What measures are being used to minimise noise related to dredging?

- A. Measures to minimise noise include selection of equipment appropriate to night time works, reduction in the number of machines operating at night and where possible the use of alternate reversing beepers with less intrusive tones.

To further ensure that noise impacts for nearby residences are minimised during construction, two temporary sand mounds approximately two metres high were built. One will be located within the reclamation area, and another located near Foreshore Road adjacent to the new boat ramp.

Q. What measures are being used to minimise impacts on recreational water craft?

- A. During dredging, recreational boat operators will use a clearly delineated 30 metre wide recreational boating channel. This recreational channel is defined by marker buoys and lights in accordance with requirements and regulations as set by NSW Maritime.

Prior to any changes to the navigation boating channel, information is provided to boat operators by way of a marine notice in the Sydney Morning Herald, advertisements, maillots to local businesses and updates at the Penrhyn Estuary boat ramp community information board.

To minimise any congestion at the existing boat ramp wharf a separate temporary loadout wharf for Project related vessels has been constructed. This is located approximately 1km north-west of

the existing boat ramp. Work vessels will only use the public wharf at Penrhyn Estuary for short periods for loading and unloading and will not be moored there. When work vessels are not required for construction activity they are moored away from the public boat ramp.

Note: A Question and Answer sheet about changes to the navigation boating channel is available by contacting the Project.

Q. What measures are being used to minimise impacts on current port operations?

- A. All current port operators are updated by the Project in regular briefings and are sent formal notices by NSW Maritime and the Sydney Harbour Master.

Q. How do I find out more about the construction phase of the Project?

- A. Web: www.sydneyports.com.au
Project Information Line: (free call):1800 177 722
Email: portbotany@baulderstone.com.au