

REPORT

Gladesville Bridge Marina Development

Sediment Management Report

Client: Gladesville Bridge Marina

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1 Introduction & Background

This **Sediment Management** report has been prepared as part of an Environmental Impact Statement (EIS) to accompany a Development Application (DA), lodged with Canada Bay Council under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

It addresses the following SEARs requirements:

Contamination

- detailed assessment of the extent and nature of any contamination of the soil, groundwater and marine sediments – Page 1
- assessment of potential risks to human health and the environmental receptors in the vicinity of the site – Page 1
- a description and appraisal of mitigation and monitoring measures – Page 1

Soil and Water

- details of sediment and erosion controls – Page 2

The Gladesville Bridge Marina includes a water-based structure and a land-based building, which is located at 380 Victoria Place, Drummoyne within the Canada Bay Local Government Area (LGA). The site is located on the southern foreshore of the Parramatta River, to the west of the Gladesville Bridge.

The site is approximately 19,740m² in area, comprising an approximate 1,740m² land-based component and an approximate 18,000m² of lease area, which accommodates the water-based component. An aerial photo of the site is shown at Figure 1.

Figure 1 Aerial photograph of the site



A summary of GBM's current services is as follows:

- 50 floating berths; berth sizes range from 25' to 75.5' (7.6m to 23m)
- 44 swing moorings; swing moorings are available for boats, with the most popular lengths from 17' (5.2m) up to 50' (15m), although there is no limit in length
- Total capacity for 99 boats
- Complimentary tender service available 7 days a week, transporting customers to and from the marina pontoons to their vessels on the swing moorings
- Dinghies availability for after-hours use
- Slipways – antifouling, boat surveys and painting. The slipway can accommodate vessels up to 60' (18m) LOA and 16' (5m) beam. Non-flybridge power vessels of up to 40' (13m) are able to be housed in our undercover slipway area for all weather painting and repairs
- Pump out facilities
- Food and beverage kiosk (currently machine based)
- Boat repairs
- Shipwright services
- Mechanical services
- Work berths
- New and used boat sales
- Charter operation (back-of-house).

The proposed development constitutes alterations and additions to the marina berth layout to provide overall storage for 130 vessels comprising 15 swing moorings and 115 floating berths (**Figure 2**). The works include:

- removal of 29 existing moorings and retention of 15 existing swing moorings;
- construction of 65 new floating berth spaces of varying sizes, that increases the number of floating berths from 50 to 115;
- cessation of slipway activities;
- demolition of the slipway rails and demolition of the internal office mezzanine structure within the covered slipway area; and
- provision of 8 new valet car parking spaces within the existing slipway area.

As the proposed development constitutes a 'Marina', with an intended capacity of more than 15 vessels having a length of 20 metres or more and an intended capacity of more than 80 vessels of any size, it is classified as 'Designated Development' under Schedule 3, Clause 23 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation).

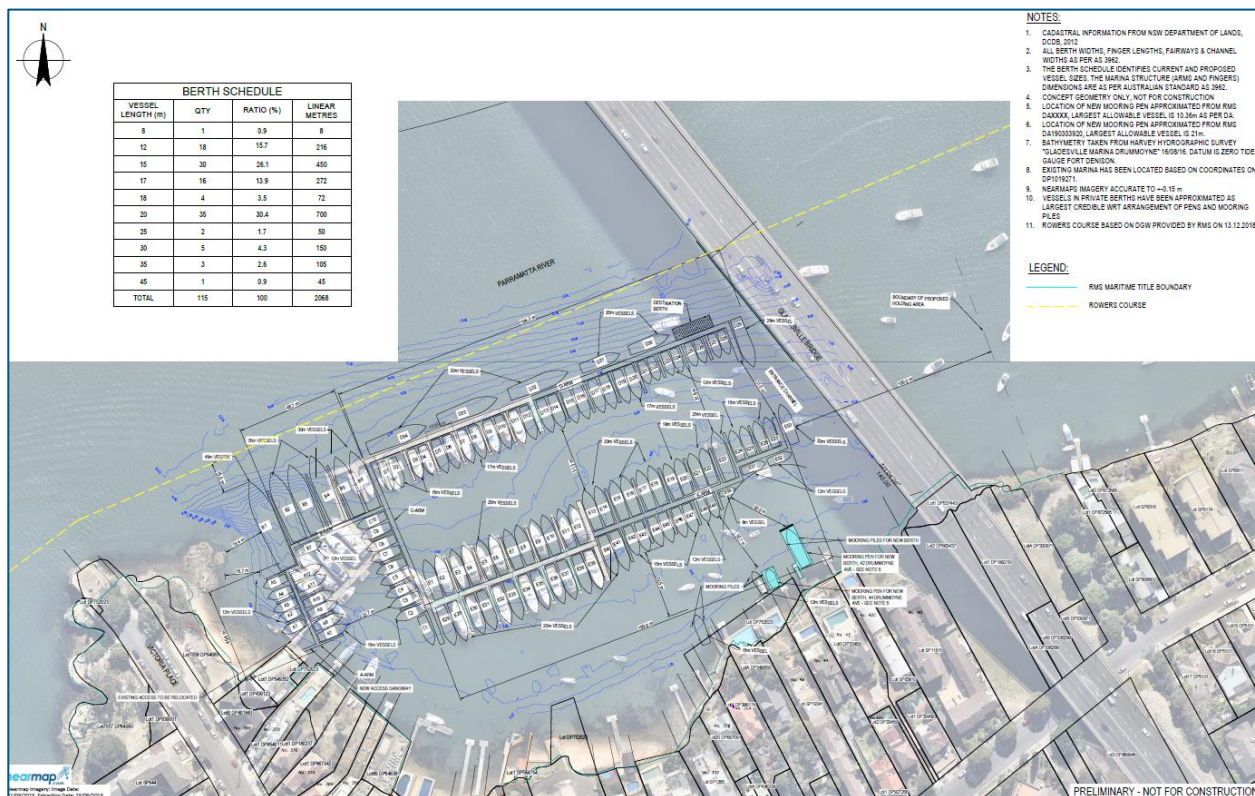


Figure 2 Gladesville Bridge Marina Development Concept Design

2 Contamination Assessment

2.1 Overview

Zoic Environmental Pty Ltd (Zoic) was requested by Gladesville Bay Marina Pty Ltd to complete a contamination assessment of soil, sediment and groundwater for the site. The objective of the Contamination Assessment was to identify soil, sediment and groundwater contamination at the site, with respect to relevant human health and ecological criteria, to support submission of a Development Application to Council.

The assessment included a desktop study of relevant background information and a site investigation. The desktop assessment found that two underground petrol storage tanks (UST) had been removed from the site. In addition, organotins (tributyltin – TBT) had been used in boat cleaning and maintenance activities.

The site investigations comprised drilling of five boreholes and installation of two groundwater wells. Soil samples were recovered from the soil profile and water samples were taken from the groundwater wells. Sediment sample were recovered from three locations including two adjoining the slipway. Samples were tested for a range of chemicals of potential concern (COPC) comprising heavy metals, petroleum hydrocarbons (TPH), polyaromatic hydrocarbons (PAHs), organotins and asbestos.

The soil analytical results indicated concentrations of COPC were below the adopted human health criteria for all samples analysed. No asbestos was detected in the soil samples. The results indicated there is no human health risk posed by concentrations of COPC in the soil.

Reported concentrations of hydrocarbons in the groundwater samples indicated a low risk of vapour intrusion/exposure, which is further mitigated by the site being covered with concrete hardstand. Zoic concluded there is no human health risk posed by concentrations of COPC in the groundwater samples tested.

Chromium, copper and zinc were identified in the groundwater at concentrations above the adopted marine water criteria. However, Zoic considered that the exceedances do not significantly exceed the criteria to pose an ecological risk and are indicative of the pervasive nature of these metals in an urban environment.

Based on the results of the soil and groundwater testing, Zoic concluded that there is a low likelihood that the former UST tankpits have any ongoing impact on soil or groundwater on site.

The results of the sediment analysis showed concentrations in exceedance of the relevant sediment quality guidelines. Reported concentrations of TPH, heavy metals (copper, nickel, lead, mercury and zinc) and TBT in the slipway sediments indicated that the concentrations may pose potential for human health and ecological exposure risk.

Soils/sediment beneath the slipway could not be investigated as the site was operational at the time of investigations.

Further sampling was undertaken to characterise sediment quality in the offshore development area by Marine Pollution Research. Sediments were collected from eight inshore locations. Samples were analysed for a range of metals and for total organic carbon (TOC). The results indicated:

- Sediment composition was variable with % fines ranging from 13 to 54% and sediments from the sites closer to the slipway generally had higher fines proportions in bottom samples compared to surface.
- Whilst lead concentrations were uniformly elevated, MPR noted that the concentrations were generally below the mean Port Jackson concentration of 364mg/kg.
- Sediments in close proximity to the slipway recorded elevated levels of copper and zinc however levels were well below the Port Jackson means of 188 and 651mg/kg respectively.
- Whilst mercury concentrations were generally below detection three surface sediment samples from sites remote to the slipway had concentrations just above the guideline value

2.2 Sediment Management Implications

The results of the contamination assessment indicated that any extension/improvement of the marina facilities must take into consideration the need to avoid/reduce sediment disturbance at and in close proximity to the slipway to minimise impacts to flora and fauna and prevent future human exposure to impacted sediment. Due to the potential ecological and human health exposure risk, Zoic concluded that a site Remedial Action Plan (RAP) should be prepared to facilitate the site redevelopment. The RAP should propose remedial measures and detail site management requirements. In particular, offsite disposal of material impacted with organotins will be required in accordance with the *NSW EPA Organotin Waste Material Chemical Control Order 1989*.

2.3 Remedial Action Plan

Zoic was subsequently requested by Gladesville Bay Marina Pty Ltd to prepare the RAP. The RAP documents site remediation requirements to ensure the site is suitable for the proposed redevelopment. The aim of the remediation for the site is to remove unacceptable concentrations of contaminants in soil

and sediment, to ensure that the site is suitable for the proposed landuse, and potential human health risk to site workers is mitigated.

The areas of concern identified within the site comprise:

- Potentially contaminated soil / sediment beneath the slipway / workshop
- Accumulated sediment in the slipway

The remediation strategy proposed by Zoic comprises removal of contaminated sediment / soil in the slipway to an approved site or facility, approved by the NSW EPA. Prior to offsite disposal, the soils will require classification in accordance with the NSW EPA Waste Classification Guidelines Part 1: Classifying Waste. In addition, site material impacted with organotins will require management in accordance with the *NSW EPA Organotin Waste Material Chemical Control Order 1989*. Collection of an additional two samples of the accumulated sediment from the slipway is proposed to allow waste classification of the sediment.

Due to limited access during the contamination assessment, additional soil/sediment sampling will be required in and under the slipway / workshop areas should any excavation be required. Zoic recommends intrusive sampling in areas that require excavation following decommissioning of the current slipway / workshop activities. Sampling density will be dependant on excavation requirements. Soil samples should be analysed for TRH/BTEX, heavy metals, organotins, PAH, OCP/PCB, asbestos and relevant TCLP analysis.

Based on the implementation of the proposed remediation strategy, Zoic considers the site will be made suitable for the proposed site alterations and additions.

3 Acid Sulfate Soils

A review of the acid sulfate soils (ASS) risk maps undertaken by Zoic indicates that the site is located on Class 2 and 5 ASS. Review of CSIRO's ASRIS Atlas of Australian Sulfate Soils map indicated that ASS has a "high probability of occurrence" on site.

However, site observations by Zoic indicated that site soils comprised clayey gravel/sand fill overlying shallow sandstone, with no sulfurous odours noted. Based on these observations, ASS are not anticipated within the site development areas.

4 Water Quality And Waste Management

4.1 General

Issues associated with water quality at the site can be conveniently discussed in terms of the construction phase of the marina and the operational phase.

In support of the EIS, water quality sampling was undertaken on 1st May 2019 in the vicinity of Gladesville Marina by Marine Pollution Research at twelve monitoring sites. Initial results indicate that overall water quality at the site is good, with deteriorating water quality expected during wet weather and recovery shortly afterwards. Deteriorating water quality is caused by general street litter and pollutants that are contained in stormwater run-off from the catchment.

At the marina, the current customer amenity facility and waste management systems have been adequate for the current activities at the marinas.

4.2 Construction Phase

A range of well accepted sediment control measures are available for adoption on site in the construction phase to mitigate against water quality impacts, such as those outlined in the Department of Housing 'Blue Book' titled "Managing Urban Stormwater and Construction – Volume 1" which provides details on the use of turbidity barriers (silt curtains).

The main construction phase impacts are likely to be due to:

- removal of existing structures;
- installation of piling; and
- movement / mooring of barges / workboats.

A turbidity barrier (silt curtain) should be installed around work areas where necessary, to contain the migration of any fine sediments in suspension. This is common practice and would be required during the removal of existing structures and excavation of the slipway.

A monitoring program should be developed for the construction phase in consultation with the consent authority. As a minimum this monitoring program should include sampling stations within and outside any turbidity barrier and testing of pH, dissolved oxygen (DO), temperature, and turbidity within the water column.

Further mitigation measures would be deployed if found necessary. Providing appropriate measures are put in place and properly maintained, it is considered that water quality impacts during construction would be acceptable.

4.3 Operational Phase

Under normal conditions, where vessels are manoeuvring at low speeds, there would be no significant propeller induced disturbance of sediments. Where vessels need to apply full power (generally for manoeuvring in windy conditions) there may be some induced turbidity, however, this is likely to be of short duration.

5 Sediment and Erosion Control Plan

5.1 Overview

A Sediment and Erosion Control Plan should be developed and incorporated into the site Construction Environmental Management Plan (CEMP). The outline of recommended management measures below should be used as a guide. All erosion and sediment controls would be in accordance with:

- Council's erosion and sediment control policy
- The contractor's CEMP
- New South Wales Department of Housing 'Blue Book' titled 'Managing Urban Stormwater and Construction – Volume 1', 4th Edition 2004.

5.2 Site Specific Criteria

The following sets out criteria for the management of soil erosion and sediment control on site during the construction phase.

Sediment control and erosion devices which should be used on site:

- **Silt Curtain.** During the works and particularly during piling works, a full depth silt curtain is likely to be considered sufficient. A localised floating silt curtain ought to be set up to control sediment around the barge during the installation of piles. The silt curtain ought to consist of a float which sits on the surface of the water and the impermeable silt curtain will hang below the water level to the riverbed.
- Silt bunds shall also be installed where construction waste could enter water to capture suspended solids, so they don't end up in waterways.
- **Visual Monitoring.** Visual monitoring of local water quality (e.g. turbidity, hydrocarbon spills/slicks) is to be undertaken on a regular basis to identify any potential spills or deficient silt curtains or erosion and sediment controls.
- **Sediment Fence:** a sediment fence should be constructed along the boundary of the site. This should be constructed from a wire and steel mesh frame with geotextile layer covering. The fence should be secured with wooden posts driven into the ground to a max depth of 0.6m and at a maximum spacing of 3m.
- **Sediment Stockpiles:** If sediment is to be stockpiled for more than 10 days it should be covered and secured with an appropriate protective covering. Stockpile height should be less than 3 m. Stockpiles should be kept away from site boundaries and Parramatta River.
- **Drop Inlet Sediment Trap System:** an excavated sediment trap with drop inlet grates surrounded by a geotextile filter. Where appropriate, these systems should be used to trap sediment onsite and minimise erosion from runoff.

The following measures should be implemented on site to manage sediment and erosion controls:

1. All sediment and erosion controls should be checked weekly and immediately after rainfall. Sediment build up to be removed before 50% of the device capacity is used and controls repaired where necessary.
2. Soil and sediment control devices should be to the standard recommended by the New South Wales Department of Housing 'Blue Book' titled 'Managing Urban Stormwater and Construction – Volume 1', 4th 2004.
3. All devices should be maintained by the contractor until such time as the disturbed areas have been rehabilitated to a condition satisfactory to the site superintendent.
4. The contractor should ensure temporary controls do not damage existing structures, kerbing, pavement or subgrades.
5. All erosion and sediment control measures should be installed prior to site disturbance to the extent that this can be practically achieved.
6. The contractor shall take care not to disturb any portion of the site other than in the immediate area of works.
7. Drainage inlet protection should be provided from the commencement of excavation works.
8. The contractor must ensure the stability and integrity of all works at the end of each day's work.
9. All reasonable and practicable measures must be taken to ensure stormwater runoff from access roads and stabilised entry/exit systems drains to an appropriate sediment control device.
10. Concrete waste and chemical products, including petroleum and oil-based products, must be prevented from entering the waterbody, or any external drainage system. Appropriate measures must be installed to trap these materials on site.
11. Stockpiles of erodible material must be provided with an appropriate protective cover (synthetic or organic) if the materials are likely to be stockpiled for more than 10 days.
12. Measures used must be appropriate for all working hours, out of hours, weekends, public holidays and during any other shutdown periods.
13. All materials removed from sediment and erosion control devices during maintenance or decommissioning, whether solid or liquid, must be disposed of in a manner that does not cause any ongoing erosion or pollution hazard.