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Sara Roach - Submission re Glebe Island Expo an Bridge.

From: Jean Stuart <stuart_jean@hotmail.com>
To: <sara.roach@planning.nsw.gov.au>
Date: 12/10/2012 10:02 AM
Subject: Submission re Glebe Island Expo an Bridge.
CC: Graham Jahn <gjahn@cityofsydney.nsw.gov.au>, <brendanb@lmc.nsw.gov.au>, gretchen gamble <gretchengamble@hotmail.com>, maire sheehan <nswaustimorfn@gmail.com>, michele hacking <mjhacking@gmail.com>, "janeyanawd@yahoo.com.au" <janeyanawd@yahoo.com.au>
Attachments: POLLUTION ISSUES FOR THE BAYS PRECINCT.doc; Boatshed plans stir contaminationfears - National - smh.com.au.html; birch.pdf; knott.pdf

Attn Ms Sara Roach.

Please find enclosed docs on Pollution of the Bays to be read in conjunction with our submission on the Gebe island Expo and rationale for retention of the Glebe Island bridge.

Kind regards

Jean Stuart President Pyrmont Community Group.

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- Fears boatshed will spell end of harbour's dragons

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Sunanda Creagh Urban Affairs Reporter
January 9, 2007

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Boatshed plans stir contamination fears

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Sunanda Creagh Urban Affairs Reporter
January 9, 2007

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POLLUTION ISSUES FOR THE BAYS PRECINCT

White, Rozelle and Blackwattle Bays have a history, through the second half of the nineteenth century until towards the end of the twentieth century, of industries polluting their waters and thus the sediments beneath.

Tanneries, abattoirs, soap making, timber storage and its pest resistant treatment, as well as shipping generally have all contributed to the contamination which now resides in the sediments of our bays and adjoining land. The latter causes additional problems due to the nature of its "infill" materials.

Whites and Johnston Creeks flow into Rozelle Bay, which, due to its shallowness and narrowness, has very low wash /flow. Pollutants from industry, storm water and road run off etc enter the bay via these creeks and thus add to the existing toxic sediments. Testing of the sediments in Blackwattle Bay also show existence of unacceptably high—by international standards— levels of toxins.

As the following information ("attached") —research carried out over many years, by Prof. Gavin Birch and associates—clearly shows the dangerously high levels of heavy metals, especially copper, lead and zinc, that reside in the heavily contaminated sediments of both Rozelle and Blackwattle Bays. Zinc levels are between 2,000 and 3,000 parts per million when the internationally acceptable safe level is 410 ppm. The adjoining in-fill land surrounding the bays Precinct are also contaminated. Some of the landfill is dredged sediments from the bays and other includes industrial and chemical waste, household garbage, ash fill, and construction and building material waste.

Areas infilled with estuarine sediment from adjacent bays contain heavy metals which can threaten groundwater. Toxins from this landfill also leech out into the waters of the bay. After World War 2 artificial insecticides and herbicides came into use and also entered our bays' environment, particularly through run off and the creeks and storm water outlets leading into the bays.

As the Glebe Bi-centennial Park required significant remediation before it could be capped (as per Homebush Bay bi Centennial Park) and made suitable for passive recreation, then it logically follows that the lands adjoining it, which were created by the same landfill manner, also require remediation prior to determining what is suitable/appropriate use for each site.

The contaminated sediment of these bays should not be disturbed, as Prof Birch has stated, as the technology to "decontaminate" it does not yet exist.

The very shallow nature of Blackwattle Bay, and to a greater extent Rozelle Bay (it is smaller and narrower) means that having motorized craft in the upper reaches of them should not be permitted, as such craft stir up—especially at low tide—these poisonous substances from the floor of the bays.

These upper reaches also have a very offensive pungent odour at low tide when the thick grey sludge is exposed to the air.

When determining future uses for the bays and their foreshores, consideration must be given to the issue of pollution, along with other major concerns such as traffic generation, and "needs" generally as outlined previously by the community.

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took place between 1979 and 1988. The significant ecological damage had been recognized by 1975 when licensing of landfills became law, but a further five years lapsed before regulations became fully enforced. A total of \$137 million was allocated for clean-up of the site in one of the largest remediation projects carried out in Australia (Suh, Birch & Hughes 2004; Suh, Birch, Matthai et al 2004). Waste comprised putrescible, building, chemical and garbage municipal waste, construction debris, household garbage, demolition waste, ash fill and dredged sediment containing heavy metals, asbestos, a range of hydrocarbons, including dioxins, benzene, toluene, ethylbenzene and xylene (BTEX) compounds and polycyclic aromatic hydrocarbons, as well as organochlorine pesticides. A total of 400 tonnes of hazardous waste comprising dioxins, furans and other organochlorine compounds was classified as Scheduled Chemical Waste which had to be destroyed by a thermal/catalytic treatment under NSW REPA license (Birch, et al, 2007). In one of the largest surveys of its kind, 4531 soil samples were collected by coring through the infill for chemical analysis (Suh, Birch & Hughes 2004; Suh, Birch, Matthai et al 2004). Areas infilled with estuarine sediment from the adjacent bay contained elevated concentrations of heavy metals and in some areas soil metal concentrations were considered high enough to pose a threat to groundwater. This soil was removed and consolidated into small manageable areas capped with impermeable clay and surrounded by leachate drains to protect surrounding aquifers. To date, monitoring of the leachate drains indicate contaminant concentrations are at acceptable levels.

In a project specially designed to test leachate production in reclaimed lands due to rainwater filtration and tidal action, Suh, Brown & Birch (2003a, 2003b) placed six boreholes through infill at Bicentennial Park adjacent to Rozelle Bay. The Park (1.01 ha) was reclaimed between 1972 and 1980 by removal of approximately 31,000 m³ of material from the adjacent bay, primarily to attain navigation depths. In addition to the marine sediments, the fill comprised demolition waste, construction materials and industrial and domestic waste. Results of the experiment showed that during dry periods when water tables recede, oxygen ingress may lead to decreasing acidity (pH) and an associated increase in the concentrations of some heavy metals (copper, lead, zinc, arsenic and

chrome). The results of the field study were tested under controlled conditions in the laboratory by percolating fresh and saline water through columns containing soil material from the park (Suh, Brown & Birch 2003a, 2003b). Although the parallel field studies had considerably higher concentrations of metals than that produced in the laboratory experiment, concentrations were orders of magnitude greater than natural sea water. It was concluded that elevated concentrations of heavy metals probably enter the estuary by tidal action and during periods of rainfall.

Although it has been demonstrated in the field and in controlled laboratory studies that the material used for infilling is a source of heavy metals to the estuary, the process has not yet been quantified. The juxtaposition of high contaminant concentrations in sediments at the heads of most estuary embayments and extensive reclamation in adjacent lands has obvious implications. However, stormwater canals also discharge to the estuary at these locations (Barry, Taylor & Birch 1999, 2001; Birch et al 1999) and differentiating the relative magnitude of each source is complex and has not yet been attempted. The extraordinary masses of materials dredged from the estuary floor for infilling and reclamation around Port Jackson gives an idea of the potential magnitude of this possible source. Almost a million tonnes of contaminated sediment from Iron Cove was used for reclamation at the mouths of Hawthorne and Iron Cove Creeks; 4.6 Mt in Homebush Bay and another 2.8 Mt on the banks of the Parramatta River (McLoughlin 2000).

Ecological effects of reclamation

It is not surprising that, with 23 per cent of the area of Port Jackson lost to reclamation, approximately 50 per cent of the shore is composed of retaining seawalls or other built habitats (Chapman & Bulleri 2003). Altered shorelines, particularly the construction of long stretches of seawalls, have major ecological impacts. The Centre for Research on Ecological Impacts of Coastal Cities at the University of Sydney is doing some excellent work on understanding the ecological role that seawalls and other intertidal structures have on urbanised estuaries (Blockley, Chapman in press; Chapman & Bulleri 2003). Seawalls differ from natural rocky shores because they are usually steep and they have fewer

contamination). Sediments from Rozelle Bay and Port Kembla were far more contaminated than those from Tambourine Bay (see Table 1 for details).

Table 1. Concentrations of metals in sediments from each collection site. Average metal concentrations are shown ($\mu\text{g/g}$; $n = 4-5$) with values greater than the ANZECC lower and upper levels are shown in grey or bold respectively.

Metal	Port Kembla	Rozelle Bay	Tambourine Bay
Arsenic	15	0	1
Cadmium	1	2	0
Cobalt	3	2	2
Copper	483	24	27
Iron	12457	11122	8696
Manganese	138	33	31
Nickel	7	8	3
Lead	689	415	123
Tin	87	7	3
Zinc	921	1196	314

Experimental design and statistical analyses

There were three experimental treatments (as outlined above): heavily contaminated sediment; less contaminated sediment; and a procedural control. These treatments were the fixed orthogonal factor of "Treatment". Six panels were used in each treatment this formed the random nested factor of "Panel". Two plates from each panel were sampled and formed the lowest level of the analysis. Analysis of variance and permanova were used to test the stated hypotheses. All analyses were done on raw data.

From : Dr Nathan Knott + Dr Emma Johnson
UNSW (2009)