



Executive Summary

This report sets out the results of a Statutory Environmental Audit conducted in accordance with Section 53V of Part IXD of the Environment Protection Act, 1970.

Name of Auditor	Dr Peter Nadebaum
Term of Appointment of Auditor	16 May 1990 to 29 November 2007
Date Environmental Audit Requested	27 November 2005
Audit Client	Environmental Protection Authority (EPA) Victoria
Audit Area	The audit area is described as the Whitehall Street, Yarraville precinct (the Precinct) and is represented on Figure 2.
Zoning	Industrial 1 Zone under the Maribyrnong City Council Planning Scheme and Hobsons Bay Planning Scheme Special Use Zone under the Port of Melbourne Corporation Planning Scheme. Planning Schemes are attached in Appendix A.
Completion Date of the Audit	9 October 2006

The audit was requested because land and groundwater in the vicinity of the lower Maribyrnong River, lower Yarra River and Stony Creek Backwash are contaminated, and there was concern that the contamination discharging into the surface waters could pose a risk to the waterways.

The objective of the audit has focussed on an assessment of the risk of any possible harm or detriment to the beneficial uses of the surface waters in the lower Maribyrnong River, the lower Yarra River and the Stony Creek Backwash that may arise from the condition of land and groundwater by industrial processes, activities and waste, including but not limited to arsenic waste used in the reclamation of the land, of the Whitehall Street Yarraville precinct, namely on:

- ▶ Port of Melbourne Corporation land in Yarraville (including the former Pivot site) and Holden Dock;
- ▶ Orica land in Yarraville;
- ▶ Mobil Yarraville Terminal land in Yarraville;
- ▶ Albright & Wilson land in Yarraville; and
- ▶ CSR Limited land in Yarraville.

The audit involved a review of the existing information and literature in relation to:

- ▶ The current and historical status, use and management of the land;
- ▶ Potential land and groundwater contamination in the Whitehall Street Yarraville precinct; and
- ▶ The nature and extent of fill used in land reclamation (with particular reference to industrial wastes containing pyritic cinders); and
- ▶ Included an assessment of the hydrodynamics of the lower Yarra and lower Maribyrnong Rivers.



In undertaking the audit, the auditor has consulted with a variety of stakeholders including industry and landowners in the area; interested residents; river users; representatives of EPA and representatives of local government.

Key findings of the audit are:

- ▶ Shallow groundwater is generally present in fill along the eastern boundary of the Precinct adjacent to the lower Yarra River, lower Maribyrnong River and the Stony Creek Backwash. This groundwater is expected to discharge to surface water.
- ▶ Shallow groundwater on some of the sites is contaminated at concentrations that are in excess of the river ecosystem protection levels. The main contaminants of concern are copper (as a toxicant to ecosystems) and ammonia (as a nutrient and stressor of ecosystems).
- ▶ The Maribyrnong and Yarra Rivers are tidal in the Precinct. Tidal flushing provides a very high level of dilution to that groundwater reaching the river, and reduces the concentrations of contaminants discharging in the groundwater to concentrations that are generally less than the ecosystem protection guidelines.
- ▶ The concentrations of contaminants measured in the river waters are less than the ecosystem protection guidelines. This is consistent with the predicted levels of dilution of groundwater in the river water.
- ▶ The discharges of contaminated groundwater can be expected to adversely affect the ecosystems of the riverbank, however the extent and significance of this effect is uncertain.
- ▶ The concentrations of contaminants contained in sediments within the river segment do not appear to be significantly different from those expected in an urbanised catchment. The contaminants are generally below or in the order of the Interim Sediment Quality Guideline – Low Trigger Values, other than at some localised areas.
- ▶ The erosion and runoff of contaminated waste materials and fill from the sites into rivers at times of rainfall is not well defined. It appears that stormwater management measures prevent this on some sites, but this is an area of significant uncertainty. If such runoff occurs, the high level of dilution will reduce any effects on the ecosystems of the river water, however it is possible that runoff could give rise to contaminated sediments in the vicinity of where runoff may enter the river system.
- ▶ The sediments of Stony Creek backwash are contaminated with petroleum hydrocarbons and heavy metals. The contamination may pose a risk to ecosystems, and to foraging birds in particular. It is recommended that further investigations be conducted in relation to the source of contamination, and assessment of the need for remediation of these sediments.
- ▶ The concentrations of contaminants measured in fish caught in the Maribyrnong and Yarra Rivers, which are likely to be associated with the Precinct activities, complied with the Australian and New Zealand Food Standards. This conclusion is consistent with observations regarding the concentrations of contaminants in the river water and sediments. The information on fish and eels caught within the Precinct was limited, and precedes a broader study of fish and eels that is currently being undertaken by EPA.
- ▶ Many individual sites within the Precinct have commissioned their own site-specific environmental assessment, and engaged environmental auditors as part of this process. The results of these further studies can be expected to add useful information and fill some of the data gaps identified in this report, and provide a better understanding of the extent of contamination and its significance.



- ▶ There are many areas of uncertainty in the findings of this audit and its conclusions, and recommendations have been made regarding further investigations and actions that can be carried out to reduce this uncertainty. This would provide for improved management of certain activities that occur within the Precinct.