



CLIENTS | PEOPLE | PERFORMANCE

**Northern Territory Government,  
Department of Planning and  
Infrastructure**

Darwin City Waterfront  
Hospitality Area  
Environmental Audit Report

Kitchener Drive, Darwin

November 2008



## Statement of Environmental Audit

This Statement provides a summary of the findings of an Environmental Audit of the site located at **Kitchener Drive, Darwin**, Northern Territory in accordance with Section 47d of the *Waste Management and Pollution Control Act (NT)*.

Note that this Statement of Environmental Audit has been compiled to meet the requirements of the development permit for the site and does not constitute a statutory Statement of Environmental Audit under the Victorian Environment Protection Act 1970.

Name of Auditor	Dr Peter Nadebaum of GHD Pty Ltd
Term of appointment of Auditor (under the Victorian Environment Protection Act 1970)	16 May 1990 to 29 November 2011
Date Audit requested	September 2003
Owners of the site	Northern Territory Government under the Administration of Department of Planning and Infrastructure.
Person requesting an Audit	Terry O'Neill of the Northern Territory Government Department of Planning and Infrastructure.
Municipality	Town of Darwin
Title Information	Part Lot 7578 Town of Darwin Volume 700 Folio 461 as defined on Lot 7768 of the Town of Darwin as described on Survey Plan LTO 2008/091 (attached in Appendix A)
Area of the Site	5,650 m <sup>2</sup>
Zoning	Central Business under the Northern Territory Planning Scheme

The audit has had regard to, amongst other things:

- ▶ The Waste Management and Pollution Control Act (NT),
- ▶ The National Environment Protection (Assessment of Site Contamination) Measure (NEPM 1999),
- ▶ Water Act (NT),
- ▶ Advice provided by the Northern Territory Environment Heritage & Arts Division, Department of Natural Resources Environment & the Arts (EHA/DNRETA), and
- ▶ Guidance provided by the Victorian Environment Protection Authority.

### Summary of Findings

The Site is historically a marine area reclaimed through uncontrolled and controlled filling and was previously utilised for industrial purposes. Remediation of the Site has been undertaken to make the Site suitable for its intended purpose, subject to certain conditions and a Site Management Plan (Environment) and Groundwater Management Plan attached to Statement of Environmental Audit, and the following information is relevant:



- ▶ Underlying fill can include glass, concrete, metal and wood pieces in the fill material at some locations. Very little biodegradable material is present and the age of the fill makes it unlikely that methane and other gases would be generated at levels of concern or above concentrations that would occur naturally where marine sediments are present. The fill material may be judged to be aesthetically objectionable if it were to be uncovered and may also adversely affect the growth of plants; however, no unsealed open space or garden areas are proposed for the site.
- ▶ Methane gas testing was undertaken in the air space of eight groundwater bores across the Stage 1 area, and seven soil gas probe locations adjacent the Multi-storey Carpark Building (adjacent the hospitality building). Methane was detected in two groundwater bores. However results were less than the adopted trigger value of 20% of the Lower Explosive Limit (LEL) of methane in air.
- ▶ Sampling and analysis has not detected any significant concentrations of asbestos in the fill in the waterfront area; however, due to the nature of the fill such material (particularly pieces of asbestos cement sheet) may be present at some localised areas of the Site. If excavations take place in the future, the work will need to be managed in accordance with the Site Management Plan (Environment) and material disposed of off Site in accordance with regulatory requirements.
- ▶ Heavy metal contamination has not been measured at concentrations that would be expected to adversely impact the health of persons working at the Site. Some metals concentrations were detected at depth exceeding the ecological criteria and it is possible that there could be some random localised concentrations of metals that could affect terrestrial ecosystems (such as tree planting). Such material has not been detected in the top meter of the fill at the site and it is concluded that metal contamination poses a low risk to terrestrial ecosystems for the proposed development and work to identify and remove any such material is not warranted.
- ▶ The fill can contain building debris (including concrete, wire and plastic) and it can be expected that the physical form of such material will make it unsuitable to remain in areas that may be proposed for garden planting.
- ▶ Soil staining (but with no associated odour) was noted at six validation locations, one of these within a proposed garden area. This soil may be judged to be aesthetically objectionable and should be removed where present within the top 0.4 m in areas that may be proposed for garden planting.
- ▶ Hydrocarbon contamination can be present in the fill and natural soil and rock, particularly in the northern area of the site. The contamination is generally several meters beneath the surface and in the vicinity of the groundwater, and can give rise to contamination of the groundwater. This contamination is odorous and may be judged to be objectionable particularly if exposed and may be hazardous to persons if they come into direct contact with the material, and if excavated will be required to be managed and disposed of off Site in accordance with regulatory requirements and the Site Management Plan (Environment).
- ▶ Groundwater at the Site is contaminated with petroleum hydrocarbons, and this may be evident by a thin film or sheen on the groundwater in some locations. This could adversely affect the lagoon if it were to drain into the lagoon. A drainage system is provided to avoid this occurring, and the Northern Territory Government advises that this system will remain in operation until monitoring shows that contamination has reduced to a level where the drainage system can safely cease operation. Groundwater should be managed in accordance with the Groundwater Management Plan.
- ▶ Consideration has been given as to whether further clean up should take place. It has been determined that clean up has been carried out to the extent practicable, and EHA/DNRETA has been consulted to confirm that it is in agreement with the determination. Natural biodegradation of



residual hydrocarbon contamination will continue to occur and the sub-soil drain will continue to remove hydrocarbons from the site. It can be expected that at some time in the future that controls such as the subsurface drain will no longer be required to operate. The assessor infers that this might occur within a decade; however, the audit concluded that there is considerable uncertainty in such an estimate.

- ▶ Potential Acid Sulphate Soil (PASS), which occurs naturally in coastal areas, was identified on the adjacent Multistory Carpark area during friction pile augering in the natural marine sediments underlying the fill. Any works undertaken that may aerate or otherwise disturb these soils (such as excavation or dewatering) must be undertaken in accordance with an Acid Sulphate Soil (ASS) management plan prepared by a qualified and experienced professional as specified in the Site Management Plan (Environment).
- ▶ There is potential for unexploded ordinance to be present, and for this to pose a risk if detonation should occur. This is outside the scope of the audit, and the risk associated with UXO is managed through other means.

The Site Management Plan (Environment) provides information on the requirements for management of materials that may be encountered if sub-surface works are carried out at the Site. The Groundwater Management Plan provides information on the requirements for ongoing monitoring of groundwater at the Site.

The audit considers only contamination of the soil and groundwater by potentially hazardous substances, and does not consider or advise on the geotechnical conditions, the requirements for management of UXO or other aspects of the suitability of the land for development.

### **Suitability of the Site**

On the basis of the work undertaken, the auditor is of the opinion that the Site is suitable for the intended purpose, that being:

A mixed use area with ground floor commercial use including cafes, shops swimming pools, open air dining areas and upstairs hotel accommodation areas. in accordance with the site development plan (Statement Attachment A), and use subject to the following conditions:

1. All future development and maintenance works at the site involving excavation, and disposal of soil and fill shall be carried out in accordance with the Site Management Plan (Environment) attached to this summary.
2. Buildings shall be designed to prevent oily water from entering the basement, and other potentially occupied sub-surface structures, where there is a likelihood of oily water being present.
3. Buildings and structures shall be built to withstand acidic conditions, particularly associated with Acid Sulphate Soil and Potential Acid Sulphate Soil.
4. Stained soil should be removed and replaced with clean fill where present within the top 0.4 m in landscaped areas.
5. Groundwater at the site shall be managed in accordance with the Groundwater Management Plan attached to this summary to avoid contaminated groundwater discharging to the lagoon, and any sub-surface spaces such as lift overruns.
6. Groundwater at the site shall not be used for any beneficial purpose other than environmental monitoring and for site remediation.



Other related Information:

Building debris (such as concrete, plastic, wire and pipes) is present in the fill and it can be expected that the physical form of such material will make it unsuitable to remain in areas that may be proposed for garden planting.

The reader should note that the SMP and GMP are subject to review and will be updated as appropriate. The reader should contact the Darwin Waterfront Corporation to obtain the current version of these documents.

This statement should be read in conjunction with the full audit report "*Northern Territory Government, Department of Planning and Infrastructure, Darwin City Waterfront, Hospitality Area, Environmental Audit Report, Kitchener Drive, November 2008*".

DATED: 13 November 2008

SIGNED: 

**PETER NADEBAUM**

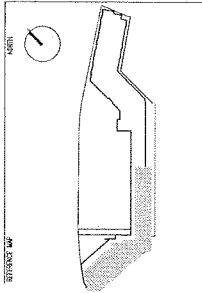
Environmental Auditor (Appointed Pursuant to the Victorian *Environmental Protection Act 1970* and recognised in the Northern Territory under section 68 of the *Waste Management and Pollution Control Act Northern Territory*).

**Statement Attachments:**

- Statement Attachment A: Site Development Plan
- Statement Attachment B: Site Management Plan (Environment) – Current version as at 5/11/2008
- Statement Attachment C: Groundwater Management Plan – Current version as at 30/7/2008



## Statement Attachment A: Site Development Plan



**NOTES**

1. SEE ALL SCALE DIMENSIONS, WHETHER DIMENSIONS GIVEN OR NOT.
2. ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
3. DIMENSIONS SHOWN ARE TO FACE UNLESS NOTED OTHERWISE.
4. DIMENSIONS SHOWN ARE TO CENTERLINE UNLESS NOTED OTHERWISE.
5. DIMENSIONS SHOWN ARE TO CENTERLINE UNLESS NOTED OTHERWISE.
6. DIMENSIONS SHOWN ARE TO CENTERLINE UNLESS NOTED OTHERWISE.
7. DIMENSIONS SHOWN ARE TO CENTERLINE UNLESS NOTED OTHERWISE.
8. DIMENSIONS SHOWN ARE TO CENTERLINE UNLESS NOTED OTHERWISE.
9. DIMENSIONS SHOWN ARE TO CENTERLINE UNLESS NOTED OTHERWISE.
10. DIMENSIONS SHOWN ARE TO CENTERLINE UNLESS NOTED OTHERWISE.

© HASSFELL & ASSOCIATES INC. 2018. ALL RIGHTS RESERVED.

THIS DRAWING IS AN UNCONTROLLED COPY. ALWAYS CHECK THE DATE.

NO.	DATE	DESCRIPTION
P	08.07.08	CONCEPT REVISION
O	28.09.07	NEW LIFT LOBBY ADDED
N	30.08.07	DOOR AND WINDOW LOCATIONS REVISED
M	24.07.07	DOOR added to Chm. RP relocated
B	13.07.07	REVISION TO LIFT PIT SLOPS ADJUSTION OF CONCRETEWORK LIFTS. WINDOW DIMENSIONS
L	02.07.07	ISSUED FOR CONSTRUCTION
K	08.06.07	Window alignment & size egs
J	21.05.07	ISSUED FOR CONSTRUCTION
I	05.05.07	ISSUED FOR INFORMATION ONLY
H	07.04.07	ISSUED FOR INFORMATION ONLY
G	07.04.07	ISSUED FOR INFORMATION ONLY
F	13.04.07	FOR CONSTRUCTION CERTIFICATE
E	24.11.06	FOR WORKS PRICING PACKAGE
D	25.10.06	FOR WORKS PRICING PACKAGE
C	13.08.06	FOR WORKS PRICING PACKAGE
B	12.09.06	FOR WORKS PRICING PACKAGE
A	05.09.06	FOR INFORMATION
1	12.09.06	FOR INFORMATION

**HASSFELL**

1100 WILSON ROAD, SUITE 101  
 1100 WILSON ROAD, SUITE 101  
 1100 WILSON ROAD, SUITE 101  
 1100 WILSON ROAD, SUITE 101

**DARWIN CITY WATERFRONT  
 HOSPITALITY / MIXED USE DEVELOPMENT**

**GROUND FLOOR PLAN  
 SHEET 1 OF 2**

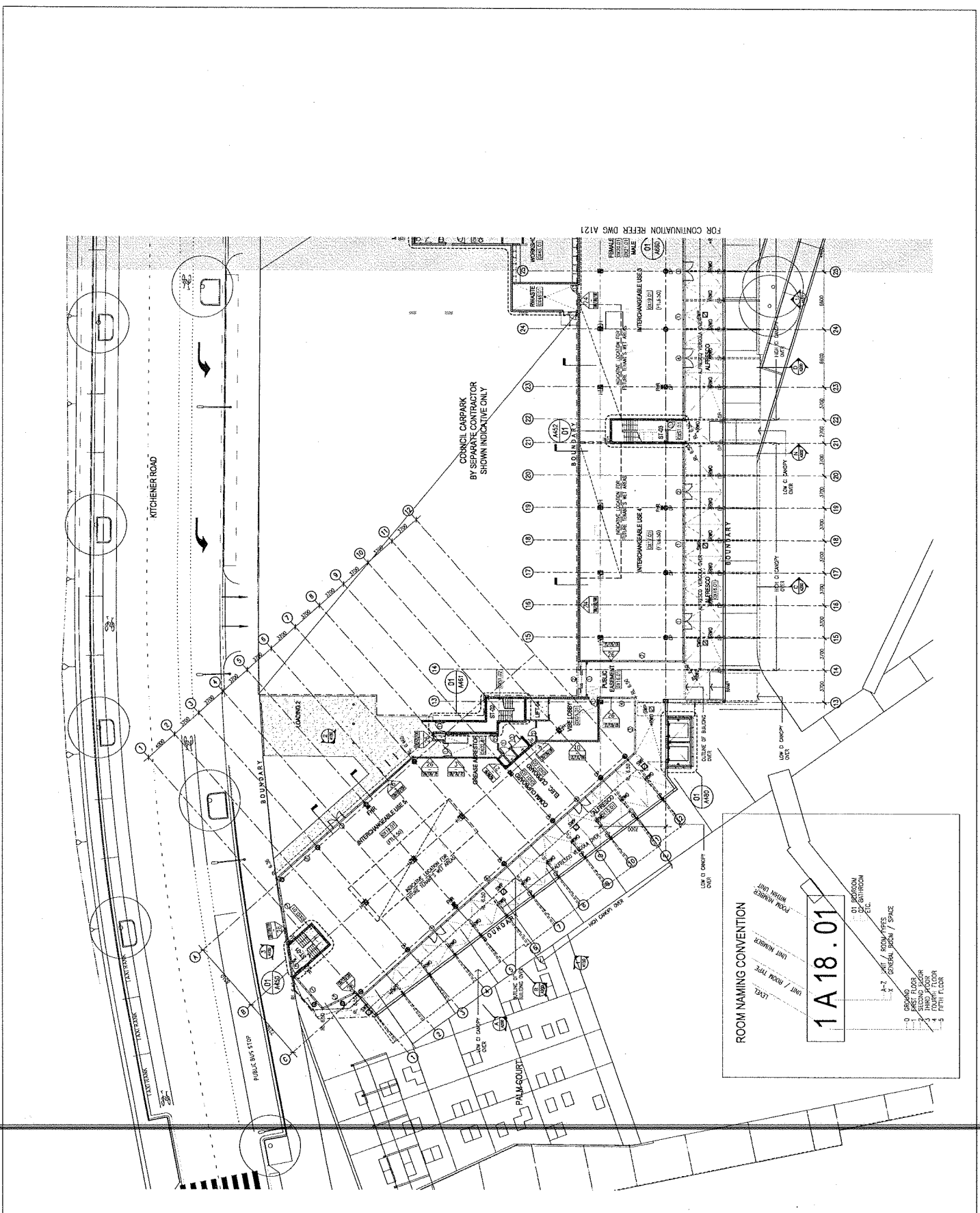
**FOR CONSTRUCTION**

SCALE: 1:100

DATE: 12/09/06

PROJECT NO: A-120

DATE: 12/09/06



**ROOM NAMING CONVENTION**

UNIT NUMBER  
 ROOM TYPE  
 LEVEL  
 FLOOR TYPE

**1 A 18. 01**

01 OFFICE  
 02 RESTROOM  
 03 ETC.

A-2 UNIT / ROOM TYPES  
 X GENERAL ROOM / SPACE

0 GROUND FLOOR  
 1 FIRST FLOOR  
 2 SECOND FLOOR  
 3 THIRD FLOOR  
 4 FOURTH FLOOR  
 5 FIFTH FLOOR

FOR CONTINUATION REFER DWG A121







**Statement Attachment B: Site Management Plan (Environment)  
– Current version as at 5/11/2008**

(Current at the time of issue of the Statement of Environmental Audit. Contact the Darwin Waterfront Corporation to obtain the current version of this document)

**SITE MANAGEMENT  
PLAN  
(ENVIRONMENT)**

SMP - Darwin Waterfront Precinct

*Prepared for*

**Darwin Waterfront Office**

GPO Box 4000  
Darwin NT 0801

5 Nov 08

42213719

**URS**

SMP - DARWIN WATERFRONT PRECINCT

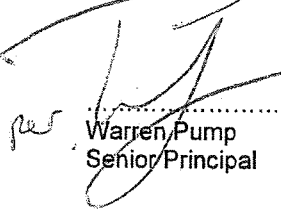
Project Manager:

  
.....  
Andrew Piggin  
Principal Engineer

URS Australia Pty Ltd

Level 3, 93 Mitchell Street  
Darwin, NT 0801  
GPO Box 2005, Darwin NT 0801  
Australia  
Tel: 61 8 8980 2900  
Fax: 61 8 8941 3920

Project Director:

  
.....  
Warren Pump  
Senior/Principal

Date: 5 Nov 08  
Reference: Rev G  
Status: Issued

