

Validation Report

Applicant:

City Design, Brisbane City Council
Level 3, T.C. Beirne Centre
Brunswick Street Mall
Fortitude Valley Qld 4006

Legal Description:

Lot 2 on RP210504
Parish of North Brisbane
Country of Stanley

Local Authority Area:

Brisbane City Council

Address of Property:

Lamington Road
New Farm Qld 4005

Registered Owner:

Brisbane City Council

Current Zoning:

Special Development Zone

Proposed Zoning:

Special Development Zone

Date of Submission:

21 May 1998

**Environmental Site Assessment -
Lot 2 on RP 210504, New Farm
Power Station, Lamington Road,
New Farm, Queensland**

Brisbane City Council

**PPK Environment &
Infrastructure Pty Ltd**

348 Edward Street
Brisbane Qld 4000
GPO Box 2907
Brisbane Qld 4001
Australia

May, 1998
84K043A-PR001A/jf

Telephone + 61 7 3218 2222
Facsimile: + 61 7 3831 4223

ACN 078 004 798

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Executive Summary

PPK Environment and Infrastructure was commissioned by Brisbane City Council to undertake a Limited Stage 2 Environmental Site Assessment (ESA) at Lot 2 on RP210504 of the former New Farm Power Station, Lamington Road, New Farm. The investigation program was undertaken to establish the environmental integrity of the site with respect to potential contamination impacts prior to finalising detailed development plans for the land and obtaining development approval.

The scope of works for the investigation program included:

- i. Soil sampling (using the Council drilling crew/contractor) of seven soil bores to a maximum depth of 6 metres (or bit refusal);
- ii. Sampling of soils for laboratory analysis of total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs), total Phenols and selected heavy metals (arsenic, cadmium, copper, chromium, lead, nickel, zinc and mercury);
- iii. Supervising the installation of three 50 mm diameter groundwater monitoring wells;
- iv. Sampling of groundwater for laboratory analysis of TPH, PAHs and selected heavy metals (arsenic, cadmium, copper, chromium, lead, nickel, zinc and mercury);
- v. Collation of results and production of report.

The major findings of the environmental site assessment showed:

- Near surface lithology encountered during the sampling programme consisted of a fill material typically ranging in depth from 0.3 to 2.6 metres below ground level (mBGL) overlying a silty clay, containing minor sand lenses, to a depth of 6 mBGL. Sand content in the silty clay increased with depth.
- On-site headspace screening of soil samples collected during the soil bore hole program reported negligible VOC readings in the seven soil bores sampled, (BH2 to BH8).
- The calculated direction of groundwater flow is to the north toward a north reach of the Brisbane River.
- An elevated (ie > DoE investigation levels) copper level was reported in one primary soil sample submitted for laboratory testing. The elevated copper level was below NEHF Health-based investigation guidelines for recreational and/or commercial purposes.
- Elevated TPH (C₆-C₃₆) levels were reported in two primary soil samples submitted for laboratory testing.
- Soil samples submitted for laboratory testing of PAHs and Phenols reported levels within current regulatory/threshold criteria.

- Groundwater samples submitted for laboratory analysis of TPH, PAHs and the selected heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury) reported levels within ANZECC Guidelines for Fresh Waters and the Dutch Intervention guidelines. Elevated levels, (with respect to background analyte levels), of chromium, copper, lead, nickel and zinc levels may be present in the groundwater.
- The following potential complete exposure pathways to humans and/or environment were identified:
 - Exposure of on-site commercial workers due to volatilisation of (hydrocarbon) constituents of concern from surface soils into outdoor and indoor air;
 - Exposure of on-site commercial workers due to ingestion and inhalation (dust) of constituents of concern in surface soils and dermal contact with constituents of concern in surface soils; and
 - Exposure of off-site nearby property occupants/users to inhalation of airborne constituents of concern from surface soils.
- Based on results of the investigation, and the understanding that the site is to be redeveloped as a community/cultural precinct, the identified complete exposure pathways are considered unlikely to present a risk to human health and/or the environment.

It is recommended that the following risk management options be considered to manage/address potential health and environmental risks associated with potential/actual contamination issues identified at the site:

- Further investigations to delineate the extent of fill material containing contaminants at/above current regulatory/threshold criteria;
- A further round of groundwater monitoring to confirm the initial results of groundwater sampling and the calculated direction of groundwater flow (NB the calculated groundwater flow direction is based on one gauging event). Additional groundwater investigations may be required to confirm background concentrations for selected heavy metals;
- Liaison with the DoE to outline investigation results to date and confirm an appropriate remedial/site management strategy, if required; and/or
- Preparation of a Site Management Plan (SMP) to ensure that any risks identified by investigations are appropriately managed in a manner which protects human health and the environment and ensures the site is suitable for the specified use.

1. Introduction

In March 1998, PPK Environment and Infrastructure (PPK), was commissioned by Brisbane City Council (BCC) to undertake a Limited Phase 2 Environmental Site Assessment (ESA) at Lot 2 on Registered Plan (RP)210504 of the former New Farm Power Station site, Lamington Road, New Farm, Queensland.

PPK understand that BCC are finalising redevelopment plans for the site and the site works were therefore undertaken to establish the environmental integrity of the site with respect to the potential impacts of past uses of the site. The scope of works undertaken for this investigation program was structured to compliment the following previous site investigations at the former Power Station facility:

- Preliminary Site Assessment (PSA) on QTSC/QEC facility of Former New Farm Power Station, Woodward-Clyde, March 1997; and
- ESA of New Farm Power Station, Lot 4 on RP210504, PPK Environment and Infrastructure, September 1997 (Ref ID: 84J153B-PR002Asr).

Site works reported herein address the scope of works as set out in PPK's proposal, dated 3rd March 1998. The scope of works included:

- Soil sampling (using the Council drilling crew/contractor) of seven soil bores to a depth of approximately 6 metres (or bit refusal);
- Sampling of soils for laboratory analysis of total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs), total Phenols and selected heavy metals (arsenic, cadmium, copper, chromium, lead, nickel, zinc and mercury);
- Supervising the installation of three 50 mm diameter groundwater monitoring wells;
- Sampling of groundwater for laboratory analysis of TPH, PAHs, Total Phenols and selected heavy metals; and
- Collation of results and production of report.

Site works were conducted during the period 4 to 13 March 1998.

2. Background Information

2.1 Property Address/Description

The site of concern for this assessment is the former Queensland Electricity Commission (QEC) facility immediately to the north west of the former Powerhouse building. The property is described as Lot 2 on RP 210504 and is located at the southern end of Lamington Road, New Farm. A map showing the site location is supplied in Appendix A.

2.2 Party Responsible for Assessment

City Design
Brisbane City Council,
T. C. Beirne Centre,
Brunswick Street Mall,
Fortitude Valley, Qld, 4006.

2.3 Environmental Consultant

PPK Environment and Infrastructure Pty Ltd
IBM Centre
348 Edward Street,
Brisbane, QLD, 4000

2.4 Proposed Land Use

The New Farm Power Station is currently decommissioned and is being considered for re-development as a community/cultural precinct. The proposed development plan for the former QEC facility includes an underground carpark and courtyard/walkways.

2.5 Operator of Site

The registered owner of the site is Brisbane City Council. The site is currently non-operational.

3. Overview of Previous Works

The Former New Farm Power Station including the QEC facility, have been the subject of three previous site investigations:

- Stage 1 - Preliminary Site Investigation New Farm Powerhouse, Brisbane City Council Analytical Services, (1993; referenced and summarised in the PPK ESA report, September 1997).
- PSA on the QTSC/QEC Site - New Farm, Woodward-Clyde (March, 1997).
- ESA of New Farm Power Station, PPK Environment & Infrastructure (September, 1997).

The following provides a summary of the key findings of the soil sampling programmes conducted as part of these investigations.

Stage 1 Preliminary Site Investigation by Brisbane City Council (1993).

The Stage 1 Preliminary Site Investigation carried out by BCC was principally confined to an area of fill on the eastern side of the site with further sampling occurring in the boiler house rubble, and various surface locations. The sampling results indicated:

- 'Soil samples obtained from the area of fill (boreholes 3, 6 and 10) reported selected heavy metal concentrations greater than Department of Environment (DoE) guidelines.'; and
- 'Organic compound results greater than DoE levels were obtained in three samples (boreholes 1, 3 and 5) and asbestos was detected in borehole 1.'

The report concluded that 'there was no evidence of any significant levels of contamination which would restrict the development of the site for the end uses proposed.'

Preliminary Site Assessment (PSA) on the QTSC Site - New Farm, Woodward-Clyde, (March, 1997).

Woodward-Clyde were commissioned by BCC in 1997 to conduct a PSA for the former QEC facility (also referred to as 'QTSC' site, and which this report is also focused). The assessment works included sampling from three locations (see Figure 1 in Appendix B). The results of this limited investigation indicated:

- Surface samples obtained from the sampling locations reported selected heavy metals (As, Cr, Cu, Pb and/or Zn) at concentrations greater than the DoE threshold values.

The report concluded that 'although heavy metals were detected at levels marginally exceeding the DoE investigative and health based thresholds, the contamination appears to be confined to the relatively shallow depths of ash and coke fill encountered across the site.'

Environmental Site Assessment(ESA) of New Farm Power Station, PPK Environment & Infrastructure (September, 1997).

The ESA undertaken by PPK was concentrated on the Powerhouse area of the site and with respect to the soil sampling program showed:

- 8 out of the 23 soil sample submitted for laboratory analysis reported selected heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, and/or Zn) and/or PAHs levels in excess of the DoE threshold values.

Report recommendations for consideration included a health risk assessment (HRA) for selected parameters to assist in developing appropriate remedial strategies for impacted soil material and further investigations to delineate the extent of soil contamination in areas which may require remedial works.

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4. Site Description

4.1 Topography

The site occupies a near rectangular piece of land approximately 120 metres by 100 metres in dimension (approximately 1.2 ha) and consists of several buildings which include offices, workshops and former transformer locations. The remainder of the property is covered in either bitumen or concrete with small former garden/grassed areas. The site is relatively flat with the surrounding area sloping towards the Brisbane River.

A site location map is presented on Appendix A.

4.2 Surrounding Land Use

The former New Farm Power Station is situated at the end of Lamington Road, in an area used extensively for light industry and public open space.

Energex (formerly SEQEB) operates a substation adjacent to the northern boundary of the site and a Commonwealth Sugar Refineries (CSR) gypsum bulk handling depot is located approximately 200 metres north of the site. The site is bordered on the south west and north east by New Farm Park and Power House Park, respectively. The Brisbane River defines the southern boundary of the site.

4.3 Regional and Local Geology

The New Farm area is located on Quaternary aged undifferentiated alluvial plains consisting of sand, silt, clay and gravel. The alluvial sediments overlay a sequence of Triassic aged volcanic and sedimentary rocks including ignimbrite, stratified and massive rhyolitic tuff, conglomerate, sandstone, and screebreccia horizons. The Triassic-aged volcano-sedimentary rocks are underlain by the Neranleigh - Fernvale Beds a folded metasedimentary sequence of interbedded shale, siltstone and greywacke (Brisbane Sheet 9543, 1:100 000 Geological Map; Department of Mines, 1986).

Near surface lithology encountered during the sampling programme consisted of a fill material typically ranging in depth from 0.3 to 2.6 metres below ground level (mBGL) overlying a silty clay with minor sand lenses to a depth of 6 mBGL. Sand content within the silty clay increased with increasing depth. A summary of the subsurface geological profile is presented in Table 1 and full bore logs with sampling details are presented in Appendix C.

Table 1: Generalised Stratigraphic Log

Depth (mBGL)	Lithology
0.0-0.3	Concrete.
0.3-2.6	FILL; Material including silty clay, concrete fragments, ash, timber and gravel.
2.6 - 5.0	CLAY; Dark grey brown silty clay, with minor sand lenses, moist, medium to high plasticity.
5.0-6.0	CLAY; Dark grey brown silty sandy clay, fine grained sand, wet, low plasticity.

4.4 Groundwater

Site investigation works encountered the groundwater at approximately 3 to 4 mBGL and the calculated groundwater flow direction is to the north towards a north reach of the Brisbane River.

There are no water supply bore records contained within the Department of Industry (DPI) Water Resources database for the New Farm area. The groundwater in the area is suitable for most purposes but marginal for human consumption, ('Groundwater Resources of Queensland' 1:2500,000 Hydrogeological Series, 1987). The groundwater is reported to have a total dissolved ion concentration of 500-1500 mg/L.

4.5 Surface Drainage

Stormwater runoff from the concrete/bitumen covered areas of the site is collected in a drainage system and directed south towards the Brisbane River.

5. Site Investigation Works

Site works consisted of sampling and testing of soil samples collected from seven soil bores (BH2 to BH8). The soil bore locations were based on a systematic grid pattern over the study area. A site layout showing the sampling locations is presented in Appendix B. Borehole BH1, a geotechnical/monitoring bore drilled by the BCC geotechnical department, was constructed prior to the commencement of the investigation programme and is shown on the sample location plan. BH1 was drilled to a depth of approximately 23.5 metres. The grid pattern was designed to provide a baseline coverage of the near surface soil conditions encountered on site. Sampling methodologies were consistent with PPK's ESA Field Procedures, (December 1995).

5.1 Soil Sampling

Soil samples were obtained at 0.5 mBGL, at 1.0 m BGL and then 1.0 m intervals (from the ground surface) to a depth of 6.0 mBGL from each soil bore for on-site screening of Volatile Organic Compounds (VOCs) and possible laboratory analysis.

On-site headspace screening of soil samples collected during the soil boring program reported negligible VOC readings in the seven bore holes sampled, (BH2 to BH8). A summary of headspace screening results is presented in Table D4 of Appendix D.

After collection, all samples were stored in chilled containers, at a temperature of less than 4°C. A total of fourteen primary soil/fill samples were submitted for NATA certified analysis of selected heavy metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc and mercury) and TPH. Eight near surface soil/fill samples were submitted for NATA certified analysis of PAHs and total Phenols.

5.2 Groundwater Sampling Methodology and Locations

Three of the soil bores were completed as groundwater monitoring wells (BH3, BH6 and BH8). Monitoring well locations are presented in the site layout in Appendix B with well logs and construction details supplied in Appendix C. Monitoring wells were positioned in a triangular arrangement across the site to determine groundwater flow direction and also the nature and extent of potential groundwater contamination.

The wells were constructed in existing soil sample/geotechnical bores and completed with 50mm diameter Class 18 PVC threaded screen and casing and a sealable cap. A graded sand filter pack was placed around the PVC screen and a bentonite seal was installed immediately above the sand pack to the ground surface to prevent surface water infiltration to the aquifer. Surface completion was a flushed mounted protective cover set in a concrete pad.

Sampling of the groundwater wells was conducted on 12th and 13th March 1998. The sampling procedure was as follows:

- ▣ Prior to sampling all wells were gauged with a water level and then developed/purged up to five well volumes (or until dry) so that a representative sample may be obtained.
- ▣ Field parameters, (temperature, electrical conductivity and pH) were measured after each well volume was removed to confirm stabilisation of parameters prior to the commencement of sampling.
- ▣ Groundwater wells were sampled using a stainless steel bailer. The bailer was rinsed in Decon90 prior to use in each of the wells and a new length of rope tied to the end to reduce the risk of well cross contamination.

A summary of the field gauging and purging data is presented in Appendix F. After collection, groundwater samples were transferred to appropriate acid washed, solvent rinsed, glass and polyethylene sample containers and stored in eskies containing frozen ice bricks to maintain a temperature below 4°C.

5.3 Handling of Samples

Upon completion of daily field activities, all soil and/or groundwater samples were checked for labelling consistency with the Chain of Custody forms and the field sampling record. Once the labelling was verified for the soil samples, the samples were stored overnight/the weekend in PPK's Sample refrigerator at a temperature below 4°C. The samples were then repacked in the esky with fresh ice bricks and submitted to the laboratory.

6. Laboratory Analysis

6.1 Analytical Laboratories Used

All primary and QA/QC analyses were performed by Amdel in their Sydney (New South Wales) laboratory. NATA certified methodologies were used for all analysis. All laboratory QA/QC procedures are described within the laboratory reports.

6.2 Laboratory Results - Soil

Analytical testing of soil/fill samples collected during the sampling program and submitted for laboratory analysis reported:

- Copper levels in one sample (BH5;1.0) above the DoE investigation guidelines;
- Arsenic, cadmium, chromium, and zinc levels were within DoE investigation guidelines;
- TPH C₆-C₃₆ levels in two samples (BH6;0.5 & BH8; 0.2-0.4) were reported in excess of the DoE recommended guidelines. TPH levels for all other soil samples submitted for testing were reported within the recommended regulatory guidelines;
- Concentrations of PAHs and total Phenols below the laboratory limits of detection and consequently lower than the DoE, ANZECC and/or NEHF Health Based Investigation guidelines.

A summary of the analytical results compared to assessment criteria is presented in Tables D1 to D4, Appendix D, and returned chain of custody forms, laboratory certificates and reports are presented in Appendix E.

6.3 Laboratory Results - Groundwater

Analytical testing of groundwater samples collected during the sampling program and submitted for laboratory analysis reported:

- Concentrations of TPH, PAHs below the laboratory limits of detection and consequently lower than the ANZECC guidelines for the Protection of Freshwater Aquatic Ecosystems and the Dutch Intervention Guidelines.
- Selected heavy metals levels reported for all groundwater samples were within the ANZECC guidelines for the Protection of Freshwater Aquatic Ecosystems and the Dutch Intervention Guidelines. Reported chromium, copper, lead, nickel and zinc levels (in groundwater sample BH8) and zinc levels (BH6) may be elevated with respect to potential background levels; (further monitoring would be required to confirm potential contaminant levels and/or background concentrations).

Note should be made that while Brisbane River reaches along the southern boundary of the site are estuarine (ie tidally affected), the ANZECC guidelines for the Protection of Freshwater Aquatic Ecosystems may be considered more appropriate for the hydrological conditions encountered in this area.

A summary of the analytical results compared to assessment criteria is presented in Tables D5 to D7, Appendix D, and returned chain of custody forms, laboratory certificates and reports are presented in Appendix E.

6.4

Quality Assurance/Quality Control

- Field investigation sampling procedures conformed to PPK Quality Assurance/Quality Control protocols to prevent cross contamination and preserve the sample integrity.
- All laboratory QA/QC procedures are described within the laboratory reports.
- Duplicate soil samples equivalent to approximately 10% of the total number of primary samples analysed were submitted to Amdel for NATA certified analysis; and
- The duplicate soil sample (TP7;7.0) analysed by Amdel recorded consistent results for selected heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury) and TPH when compared with the original soil sample (TP7;4.0) results.

7. Contamination Criteria

The laboratory analysis results are compared with commonly applied regulatory requirements/criteria for sites which have potentially been impacted through previous land use. The contaminant acceptance criteria are usually threshold concentrations of specific contaminants which, if exceeded in a particular sample, may pose a health or environmental based risk and warrant further site specific investigation or risk analysis.

For all analytes tested in soil samples, Queensland DoE Soil Investigation Levels (Queensland DoE, 1992) have been adopted as the regulatory criteria in the first instance, with ANZECC and/or National Enviro Health Forum (NEHF)/South Australian Health Commission (SAHC) Health Based Soil Investigation Levels criteria used in the absence of DoE guidelines.

For all analytes tested in groundwater samples, ANZECC Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC, 1992) have been adopted as the regulatory criteria in the first instance, with Dutch Intervention Guidelines (Ministry for Housing, Spatial Planning and the Environment, Netherlands, 1994) used in the absence of ANZECC Guidelines.

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8. Qualitative Risk Assessment

Reported levels of copper and/or TPH were reported above the DoE investigation levels. Elevated (ie >DoE investigation levels) contaminant levels were mainly recorded in the near surface fill material, however, elevated copper levels were reported in the underlying silty clay. However, elevated copper levels were below NEHF Health-based investigation guidelines for recreational and/or commercial purposes. The contaminant levels reported in the Woodward Clyde March 1997 PSA also do not exceed NEHF Health-based investigation guidelines for recreational and/or commercial purposes.

The levels of selected heavy metals reported for the groundwater samples were within the ANZECC guidelines for the Protection of Freshwater Aquatic Ecosystems and the Dutch Intervention Guidelines. Note should be made that marginal to moderately elevated levels (with respect to background analyte levels) of chromium, copper, lead nickel and zinc levels may be present in the groundwater. Further monitoring (and/or investigations) would be required to confirm the presence of these metals in the underlying groundwater.

Based upon these results, (and the understanding that the site is to be redeveloped as a community/cultural precinct), the potential complete exposure pathways to humans and/or the environment were identified for the following reasonable case:

1. Exposure of on-site commercial workers due to volatilisation of (hydrocarbon) constituents of concern from surface soils into outdoor and indoor air;
2. Exposure of on-site commercial workers due to ingestion and inhalation (dust) of constituents of concern in surface soils and dermal contact with constituents of concern in surface soils; and
3. Exposure of off-site nearby property occupants/users to inhalation of airborne constituents of concern from surface soils.

PPK consider that the following identified complete exposure pathways are unlikely to present a risk to human health and/or the environment:

1. The identified constituents were predominantly non-volatile, heavy hydrocarbons in the chain length C₂₉ to C₃₆. The elevated TPH levels were also reported in the top 0.5m and carpark construction works may be expected remove a significant proportion of near surface material. Exposure to hydrocarbon vapours is therefore considered unlikely.

2&3. The proposed redevelopment plans (ie carpark and courtyard areas) may be expected to remove or cap areas of contaminated soil. A site-specific workplace health and safety plan (WHASP) will be required for the construction phase of the redevelopment. Exposure to contaminated soils via ingestion, inhalation and/or dermal contact is therefore considered unlikely. Elevated heavy metal levels are also within NEHF Health-based investigation guidelines.

Other Issues

In addition to the above chronic risks, the natural degradation of organic compounds in areas of surface impacts may pose a risk by the generation of potentially explosive or asphyxiant vapours (i.e. methane and carbon dioxide). Such a risk would be likely if vapours can migrate and collect within sub-surface utility/service conduits, in the vicinity of electrical infrastructure or in trenches excavated on site.

It is assumed that suitable work practices would be in place to reduce the risk of explosion/asphyxiation from works at the site.

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9. Risk Management Options

Based upon the results obtained during the March 1998 ESA and PPK's understanding that the site is to be redeveloped for commercial/recreational activities, the following risk management options may be considered to manage/address potential health and environmental risks associated with impacted soils identified at the site:

- Further investigations to delineate the extent of fill material containing contaminants at/above current regulatory/threshold criteria;
- A further round of groundwater monitoring to confirm the initial results of groundwater sampling and the calculated direction of groundwater flow (NB the calculated groundwater flow direction is based on one gauging event). Additional groundwater investigations may be required to confirm background concentrations for selected heavy metals;
- Liaison with the DoE to outline investigation results to date and confirm an appropriate remedial/site management strategy, if required; and/or
- Preparation of a Site Management Plan (SMP) to ensure that any risks identified by investigations are appropriately managed in a manner which protects human health and the environment and ensures the site is suitable for the specified use. The SMP would outline management conditions relating to contamination issues that may include, but not be limited to, health and safety and appropriate remedial/management or monitoring strategies.

10. Conclusions

This investigation consisted of a soil and groundwater sampling program, at New Farm Power Station, Lamington Road, New Farm to assess the environmental integrity of the site prior to redevelopment by Brisbane City Council. The site investigation consisted of the sampling and analyses of soil samples collected from seven soil bores and groundwater samples collected from three groundwater monitoring wells, in accordance with the Scope of Works.

The following conclusions can be made with respect to this assessment:

- Near surface lithology encountered during the sampling programme consisted of a fill material typically ranging in depth from 0.3 to 2.6 metres below ground level (mBGL) overlying a silty clay, containing minor sand lenses, to a depth of 6 mBGL. Sand content in the silty clay increased with depth.
- On-site headspace screening of soil samples collected during the soil bore hole program reported negligible VOC readings in the seven soil bores sampled, (BH2 to BH8).
- The calculated direction of groundwater flow is to the north toward a north reach of the Brisbane River.
- The elevated copper level was below NEHF Health-based investigation guidelines for recreational and/or commercial purposes. An elevated (ie > DoE investigation levels) copper level was reported in one primary soil sample submitted for laboratory testing.
- Elevated TPH (C₈-C₃₆) levels were reported in two primary soil samples submitted for laboratory testing.
- Soil samples submitted for laboratory testing of PAHs and Phenols reported levels within current regulatory/threshold criteria.
- Groundwater samples submitted for laboratory analysis of TPH, PAHs and the selected heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury) reported levels within ANZECC Guidelines for Fresh Waters and the Dutch Intervention guidelines. Elevated levels, (with respect to background analyte levels), of chromium, copper, lead, nickel and zinc levels may be present in the groundwater.
- The following potential complete exposure pathways to humans and/or environment were identified:
 - ▷ Exposure of on-site commercial workers due to volatilisation of (hydrocarbon) constituents of concern from surface soils into outdoor and indoor air;
 - ▷ Exposure of on-site commercial workers due to ingestion and inhalation (dust) of constituents of concern in surface soils and dermal contact with constituents of concern in surface soils; and

- ▶ Exposure of off-site nearby property occupants/users to inhalation of airborne constituents of concern from surface soils.
- Based on results of the investigation, and the understanding that the site is to be redeveloped as a community/cultural precinct, the identified complete exposure pathways are considered unlikely to present a risk to human health and/or the environment.

Based on these conclusions, it is recommended that the following risk management options be considered to manage/address potential health and environmental risks associated with potential/actual contamination issues identified at the site:

- Further investigations to delineate the extent of fill material containing contaminants at/above current regulatory/threshold criteria;
- A further round of groundwater monitoring to confirm the initial results of groundwater sampling and the calculated direction of groundwater flow (NB the calculated groundwater flow direction is based on one gauging event). Additional groundwater investigations may be required to confirm background concentrations for selected heavy metals;
- Liaison with the DoE to outline investigation results to date and confirm an appropriate remedial/site management strategy, if required; and/or
- Preparation of a Site Management Plan (SMP) to ensure that any risks identified by investigations are appropriately managed in a manner which protects human health and the environment and ensures the site is suitable for the specified use.

11. Statement of Limitations

This assessment was restricted to the agreed-upon Scope of Services. No representations or warranties are made concerning the nature or quality of the soil and water, or any other substance on the Property, other than the visual observations and analytical data as stated in this report.

On all sites varying degrees of non-uniformity of the vertical and horizontal soil conditions are encountered. Hence no sampling technique can completely eliminate the possibility that samples are not totally representative of soil conditions encountered. The sampling can only reduce this possibility to an acceptable level.

It should also be recognised that site conditions, including contaminant extent and concentrations can change with time. This is particularly relevant if this report is used after a protracted delay, such that further investigation of the site may be necessary.

In preparing this report, PPK Environment & Infrastructure has relied upon certain verbal information and documentation provided by the client and/or third parties. Except as discussed, PPK Environment & Infrastructure did not attempt to independently verify the accuracy or completeness of that information, but did not detect any inconsistency or omission of a nature that might call into question the validity of any of it. To the extent that the conclusions in this report are based in whole or in part on such information, they are contingent on its validity. PPK Environment & Infrastructure assume no responsibility for any consequences arising from any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to PPK Environment & Infrastructure.

Within the limitations of the agreed-upon Scope of Services, this assessment has been undertaken and performed in a professional manner, in accordance with generally accepted practices, using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, express or implied, is made.

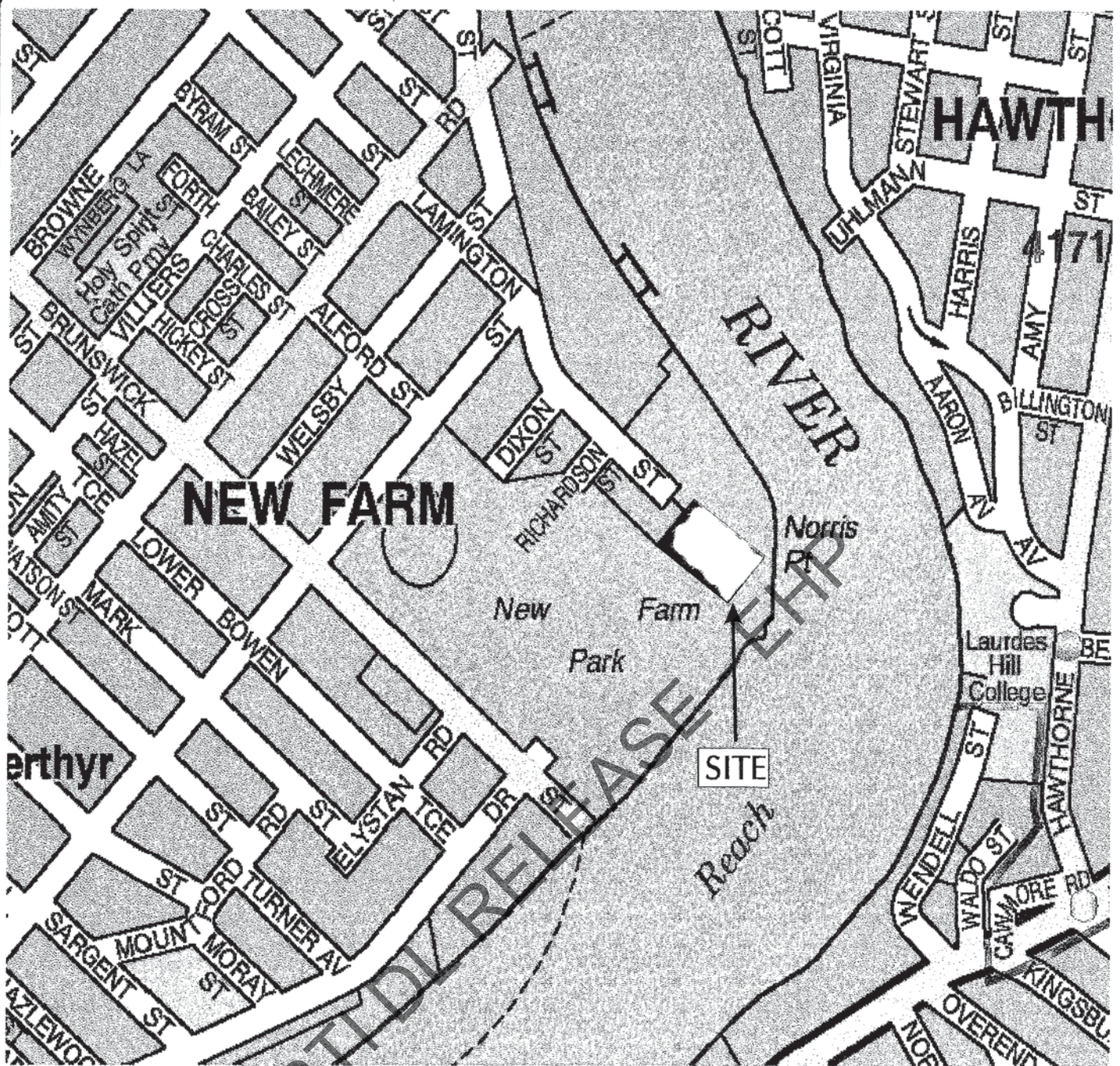
This report is based upon the Scope of Services, and is subject to the Limitations and Restrictions, defined herein. It has been prepared on behalf of Brisbane City Council (BCC) for the benefit of BCC. No person or organisation other than BCC is entitled to rely upon any part of it without the prior written consent of PPK Environment & Infrastructure; and such third party in using or relying on this report shall have no legal recourse against PPK Environment & Infrastructure or its parent or subsidiaries, and shall indemnify and defend them from and against all claims arising out of, or in conjunction with, such use or reliance.

12. References

1. Australian and New Zealand Environment Conservation Council, 1992, *Guidelines for the Assessment and Management of Contaminated Sites*.
2. Australian and New Zealand Environment Conservation Council, 1992, *Australian Water Quality Guidelines for Fresh and Marine Waters*.
3. Imray and Langley, 1996, *Development of Health Based Investigation Levels. (Taken from the Third National Workshop on the Health Risk Assessment and Management of Contaminated Sites)*.
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6. Queensland DoE, 1992, *Guidelines for the Assessment of Contaminated Land in Queensland*.
7. Queensland Water Resources Commission, 1987, *Groundwater Resources of Queensland*.
8. Risk Assessment and Environmental Quality Division, Directorate of Chemicals, External Safety and Radiation Protection, Ministry of Housing, Spatial Planning and the Environment, 1994, *Environmental Quality Objectives in the Netherlands*.

Appendix A

Site Location Map



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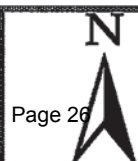
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New Farm Power Station
Lamington Road,
New Farm, QLD.
Site Location

SCALE:
Not to Scale

Date:
23/03/98 Collection 15
84K043A\drfacad\locat

PPK
Environment & Infrastructure

12th Floor IBM Centre
348 Edward Street
Brisbane QLD 4000
G.P.O. Box 2907
Brisbane QLD 4000
Tel 07 3218 2222
Fax 07 3831 4223



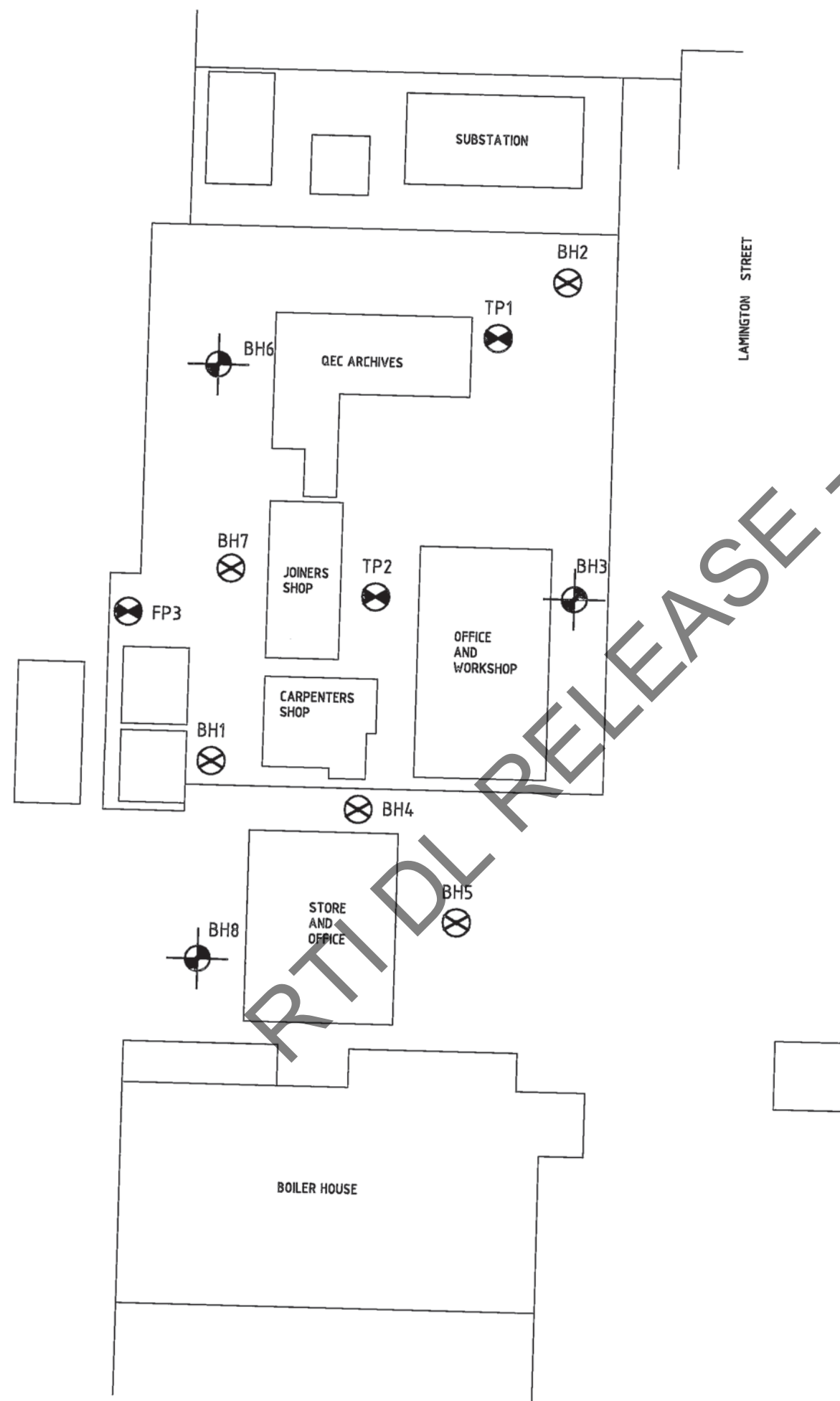
Page 26

Release

RTI DL RELEASE - EHP

Appendix B

Site Layout and Sample Locations



KEY:

- TP1
 WOODWARD-CLYDE TEST PIT LOCATION
- BH3
 BOREHOLE
- BH6
 BOREHOLE WITH GROUNDWATER MONITORING WELL INSTALLED

RTI 13-106

Collection 15

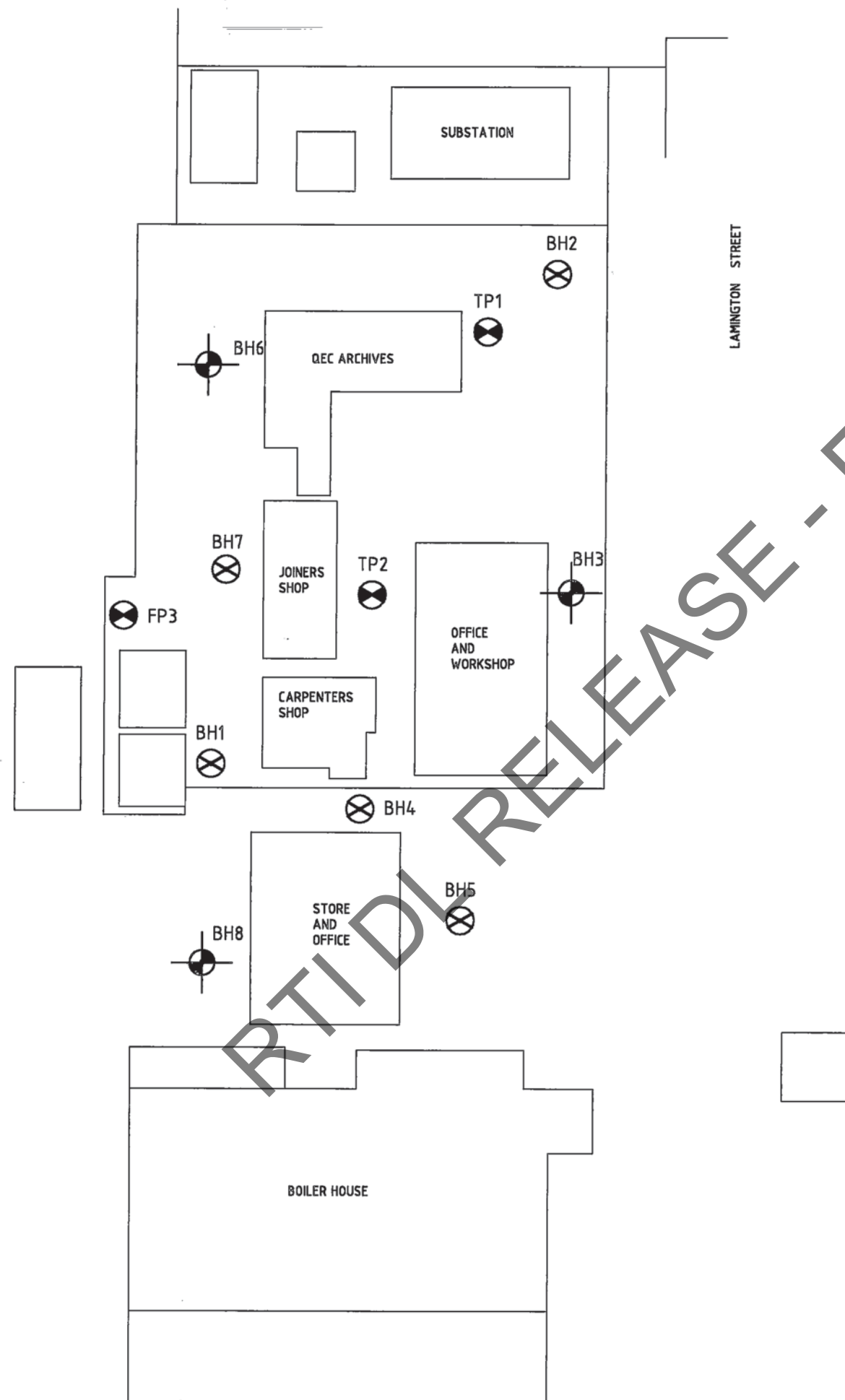
NOT TO SCALE

PPK
Environment & Infrastructure
12th Floor IBM Centre
348 Edward Street
Brisbane QLD 4000
G.P.O. Box 2907
Brisbane
QLD. 4000 Australia
Tel. 07 3218 2222
Fax 07 3831 4223
Email
ppkbris@ozemail.com.au

**NEW FARM POWER STATION
LOT 2 ON RP210504**

BOREHOLE LOCATIONS

Job No	84K043A	Release
Drawing No	FIG 1	Rev.



KEY:



TP1
WOODWARD-CLYDE
TEST PIT LOCATION

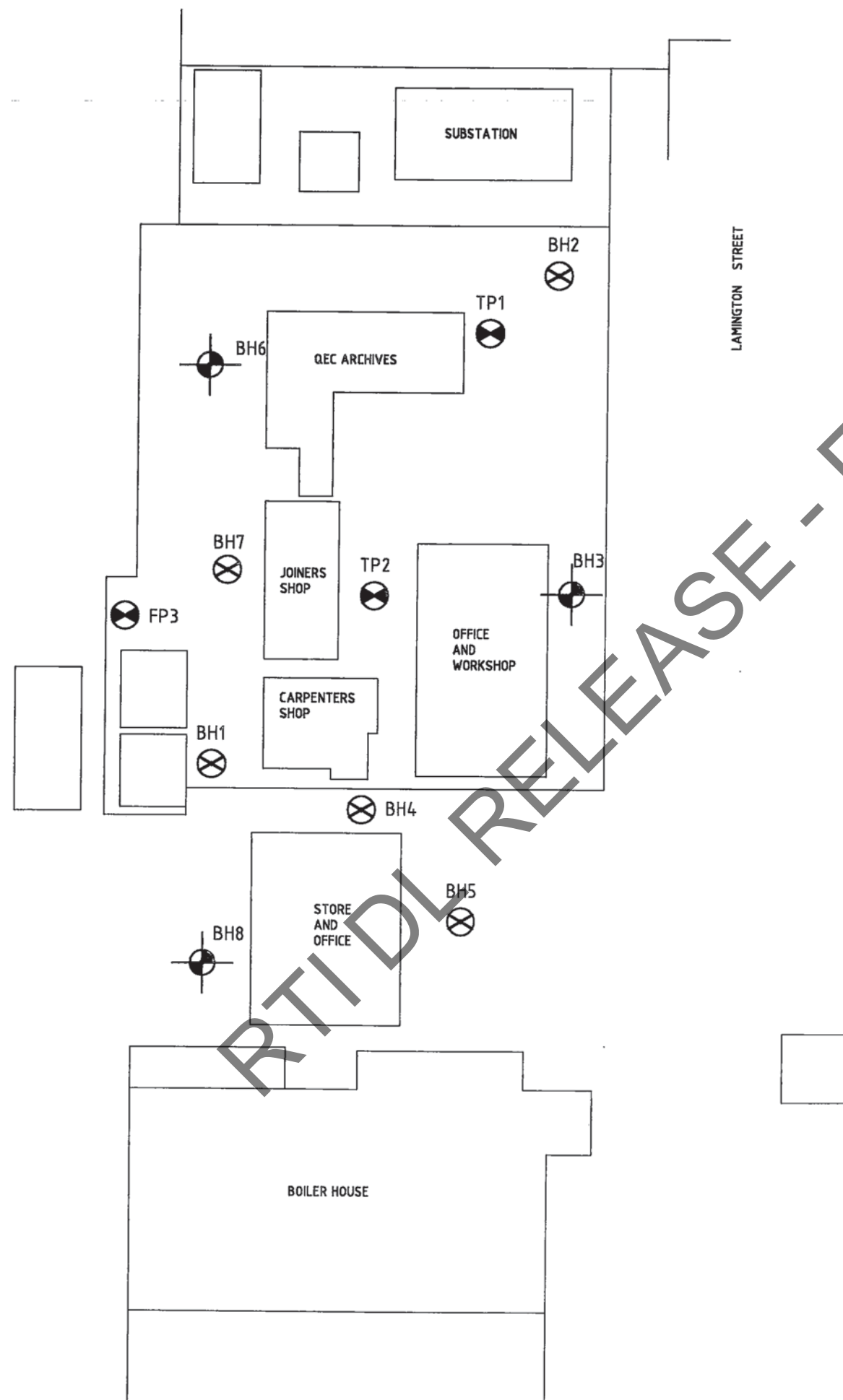


BH3
BOREHOLE



BH6
BOREHOLE WITH GROUNDWATER
MONITORING WELL INSTALLED

NOT TO SCALE



- KEY:**
- TP1
WOODWARD-CLYDE
TEST PIT LOCATION
 - BH3
BOREHOLE
 - BH6
BOREHOLE WITH GROUNDWATER
MONITORING WELL INSTALLED

NOT TO SCALE

PPK
Environment & Infrastructure
12th Floor IBM Centre
348 Edward Street
Brisbane QLD 4000
G.P.O. Box 2907
Brisbane
QLD. 4000 Australia
Tel. 07 3218 2222
Fax 07 3831 4223
Email
ppkbris@ozemail.com.au

**NEW FARM POWER STATION
LOT 2 ON RP210504**

Job No
84K043A

BOREHOLE LOCATIONS

Drawing No
FIG 1

Page 1

RTI DL RELEASE - EHP

Appendix C

Soil Bore Logs

Borehole Log - BH2

New Farm Power Station ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
				GENERAL INFORMATION
				LOCATION: New Farm Power Station Lamington Road New Farm
				DATE DRILLED 4 March 1998
				EQUIPMENT USED Drilling Company: Paddy Christensen & Son Drilling Rig with 120 mm solid stem auger.
NATURAL GROUND LEVEL 0.0 Concrete		0.0		
Clay - Medium Brown silty clay, dry, low to med plasticity		0.4	BH2;0.5 PID 0.0 ppm	
			BH2;1.0 PID 0.0 ppm	
Silt - Yellow brown sandy silt, Dry, low plasticity		1.5	BH2;2.0 PID 0.0 ppm	
Silt - Brown clayey silt, Moist, low to med plasticity		2.0		
Clay - Brown clay with streaks of sand, Moist, medium plasticity		2.8	BH2;3.0 PID 0.0 ppm	
Groundwater at ~3.5 m		3.5	BH2;4.0 PID 0.0 ppm	
Clay - Grey brown silty clay with nodules of sand, wet, medium to high plasticity			BH2;5.0 PID 0.0 ppm	
Clay - Dark grey silty clay with streaks of sand, wet, medium plasticity		4.5		
Clay - Dark grey sandy silty clay, wet, low to med plasticity		5.0	BH2;6.0 PID 0.0 ppm	
Bore Log ceased at 6.0 m		6.0		
				BOREHOLE BH2
Logged By: [Personal information]		Sampled By: [Personal information]		
Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour		Notes		
RTI 13-106		Collection 15		JOB NO. 84K043A DRG. NO. bore_bh2 Page 32

BORE HOLE DETAILS - BH3

New Farm Power Station ESA

STRATIGRAPHIC DESCRIPTION	LOG	WELL CONSTRUCTION	DETAILS																
<p>NATURAL GROUND LEVEL</p> <p>0.0</p> <p>Concrete</p> <p>Clay - Dark grey silty clay, dry, low to med plasticity</p> <p>Sand - Brown clayey sand, fine grained sand, moist, low plasticity</p> <p>Clay - Grey brown silty clay, Moist, medium plasticity</p> <p>Clay - Dark Grey silty clay, wet, medium to high plasticity</p> <p>Groundwater at ~3.8 m</p> <p>Borehole terminated at 3.5 mBGL</p>			<p>GENERAL INFORMATION</p> <p>LOCATION: Lamingian Road, New Farm.</p> <p>DATE DRILLED: 6 March 1998</p> <p>EQUIPMENT USED</p> <p>Drilling Company: Paddy Christensen & Son</p> <p>Drilling Rig with 120 mm solid stem auger.</p> <p>Well Construction Details</p> <p>50 mm Class 18 threaded, slotted, acid washed, PVC screen from 4.0 to 5.5 m BGL. Filter sand from 3.3 m BGL to 6.0 m BGL, bentonite seal from 0.1 m to 3.3 mBGL. Concrete pad and flush mount from ground surface to 0.1 mBGL. Lockable cap.</p> <p>PID READINGS</p> <table border="1"> <thead> <tr> <th>DEPTH(mBGL)</th> <th>PID (ppm)</th> </tr> </thead> <tbody> <tr><td>0.5</td><td>0.0</td></tr> <tr><td>1.0</td><td>0.0</td></tr> <tr><td>2.0</td><td>0.0</td></tr> <tr><td>3.0</td><td>0.0</td></tr> <tr><td>4.0</td><td>0.0</td></tr> <tr><td>5.0</td><td>0.0</td></tr> <tr><td>6.0</td><td>0.0</td></tr> </tbody> </table>	DEPTH(mBGL)	PID (ppm)	0.5	0.0	1.0	0.0	2.0	0.0	3.0	0.0	4.0	0.0	5.0	0.0	6.0	0.0
DEPTH(mBGL)	PID (ppm)																		
0.5	0.0																		
1.0	0.0																		
2.0	0.0																		
3.0	0.0																		
4.0	0.0																		
5.0	0.0																		
6.0	0.0																		
<p>Logged By: [Personal information]</p> <p>Field Classification</p> <p>0 No obvious contamination</p> <p>1 Slight visual contamination and/or slight odour</p> <p>2 Visual contamination and/or odour</p> <p>3 Gross visual contamination and/or strong odour</p>	<p>Sampled By: [Personal information]</p> <p>Notes</p>	<p>BOREHOLE BH3</p> <p>PPK Environment & Infrastructure</p> <p>JOB NO. 84K043A DRG. NO. BH3 Page 33</p>																	

Borehole Log - BH4

New Farm Power Station ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
				GENERAL INFORMATION
NATURAL GROUND LEVEL		0.0		LOCATION: New Farm Power Station Lamington Road New Farm
Concrete		0.3	BH4;0.5 PID 0.0 ppm	
Fill - Ash and bits of concrete		0.5	BH4;1.0 PID 0.0 ppm	DATE EXCAVATED 6 March 1998
Clay - Red brown silty clay, moist, low to med plasticity			BH4;2.0 PID 0.0 ppm	
Groundwater at ~3.0 m ▼		3.0	BH4;3.0 PID 0.0 ppm	EQUIPMENT USED Drilling Company: Paddy Christensen & Son Drilling Rig with 120 mm solid stem auger.
Clay - Brown silty clay with nodules of yellow medium grained sand, wet, medium to high plasticity			BH4;4.0 PID 0.0 ppm	
			BH4;5.0 PID 0.0 ppm	
Bore Log ceased at 6.0 m		6.0	BH4;6.0 PID 0.0 ppm	
				BOREHOLE BH4
Logged By [REDACTED] Personal information		Sampled By [REDACTED] Personal information		
Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour		Notes		
06		Collection 15		JOB NO. 84K043A DRG. NO. bore_bh4 Page 34

RTI RELEASE - EHP

Borehole Log - BH5

New Farm Power Station ESA

STRATIGRAPHIC DESCRIPTION		LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
NATURAL GROUND LEVEL					GENERAL INFORMATION LOCATION: New Farm Power Station Lamington Road New Farm DATE EXCAVATED 6 March 1998 EQUIPMENT USED Drilling Company: Paddy Christensen & Son Drilling Rig with 120 mm solid stem auger.
0.0	Concrete		0.0	BH5;0.5 PID 0.0 ppm	
	Clay - Red brown silty clay, moist, low to med plasticity		0.55		
	Clay - Dark grey sandy silty clay, fine grained sand, moist, medium plasticity		0.75	BH5;1.0 PID 0.0 ppm	
				BH5;2.0 PID 0.0 ppm	
				BH5;3.0 PID 0.0 ppm	
	Groundwater at ~2.8 m		2.8	BH5;4.0 PID 0.0 ppm	
	Clay - Dark Grey brown silty clay wet, medium to high plasticity			BH5;5.0 PID 0.0 ppm	
				BH5;6.0 PID 0.0 ppm	
	Clay - Dark brown silty clay with rare fine grained sand, wet, medium plasticity		5.5		
	Bore Log ceased at 6.0 m		6.0		
RTI DL RELEASE - EHP					
Logged By [Personal information]		Sampled By [Personal information]		BOREHOLE BH5	
Field Classification		Notes		PPK Environment & Infrastructure	
0 No obvious contamination				JOB NO. 84K043A DRG. NO. bore_bh5	
1 Slight visual contamination and/or slight odour				Page 35	
2 Visual contamination and/or odour					
3 Gross visual contamination and/or strong odour					
Collection 15					

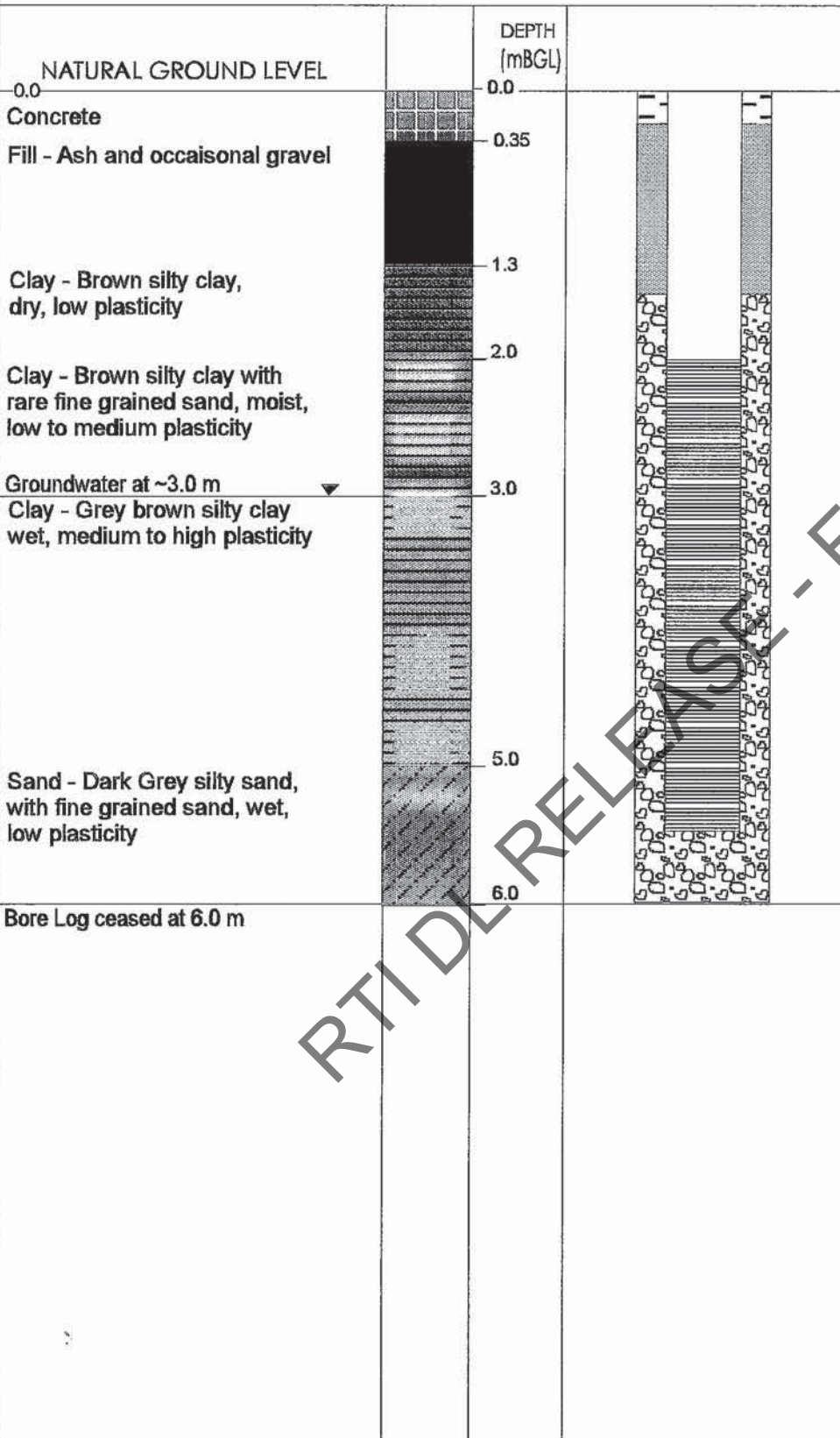
BORE HOLE DETAILS - BH6

New Farm Power Station ESA

STRATIGRAPHIC DESCRIPTION LOG

WELL CONSTRUCTION

DETAILS



GENERAL INFORMATION

LOCATION: Lamington Road, New Farm.

DATE DRILLED: 6 March 1998

EQUIPMENT USED

Drilling Company:
Paddy Christensen & Son
Drilling Rig with
120 mm solid stem auger.

Well Construction Details
50 mm Class 18 threaded, slotted, acid washed, PVC screen from 2.0 to 5.0 m BGL. Filter sand from 1.5 m BGL to 6.0 m BGL, bentonite seal from 0.1 m to 1.5 m BGL. Concrete pad and flush mount from ground surface to 0.1 m BGL. Lockable cap.

PID READINGS

DEPTH(mBGL)	PID (ppm)
0.5	0.0
1.0	0.0
2.0	0.0
3.0	0.0
4.0	0.0
5.0	0.0
6.0	0.0

BOREHOLE BH6

PPK
Environment & Infrastructure

JOB NO. 84K043A DRG. NO. BH6
Page 36

Logged By: [Personal information]

Sampled By: [Personal information]

Field Classification

- 0 No obvious contamination
- 1 Slight visual contamination and/or slight odour
- 2 Visual contamination and/or odour
- 3 Gross visual contamination and/or strong odour

Notes

Borehole Log - BH7

New Farm Power Station ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
<p>NATURAL GROUND LEVEL</p> <p>0.0</p> <p>Concrete</p> <p>Fill - Orange gravelly sandy clay, dry, low plasticity</p> <p>Fill - Large pieces of gravel, small amount of fines, dry</p> <p>Angular gravel up to 5x4x2 cm</p> <p>Clay - Grey brown silty clay wet, medium to high plasticity</p> <p>Groundwater at ~3.0 m</p> <p>Clay - Dark grey silty clay, wet, medium to high plasticity, some organic matter present</p> <p>Sand - Dark Grey silty sand, with fine grained sand, wet, low plasticity</p> <p>Bore Log ceased at 6.0 m</p>		<p>0.0</p> <p>0.3</p> <p>0.7</p> <p>2.5</p> <p>3.3</p> <p>5.5</p> <p>6.0</p>	<p>BH6;0.5 PID 0.0 ppm</p> <p>BH7;1.0 PID 0.0 ppm</p> <p>BH7;2.0 PID 0.0 ppm</p> <p>BH7;3.0 PID 0.0 ppm</p> <p>BH7;4.0 PID 0.0 ppm</p> <p>BH7;5.0 PID 0.0 ppm</p> <p>BH7;6.0 PID 0.0 ppm</p>	<p>GENERAL INFORMATION</p> <p>LOCATION: New Farm Power Station Lamington Road New Farm</p> <p>DATE EXCAVATED 9 March 1998</p> <p>EQUIPMENT USED Drilling Company: Paddy Christensen & Son Drilling Rig with 120 mm solid stem auger.</p>
				<p>BOREHOLE BH7</p>
<p>Logged By: Personal information</p>		<p>Sampled By: Personal information</p>		<p>PPK Environment & Infrastructure</p>
<p>Field Classification</p> <p>0 No obvious contamination</p> <p>1 Slight visual contamination and/or slight odour</p> <p>2 Visual contamination and/or odour</p> <p>3 Gross visual contamination and/or strong odour</p>		<p>Notes</p>		<p>JOB NO. 84K043A DRG. NO. bore_bh7</p>
<p>Collection 15</p>				<p>Page 37</p>

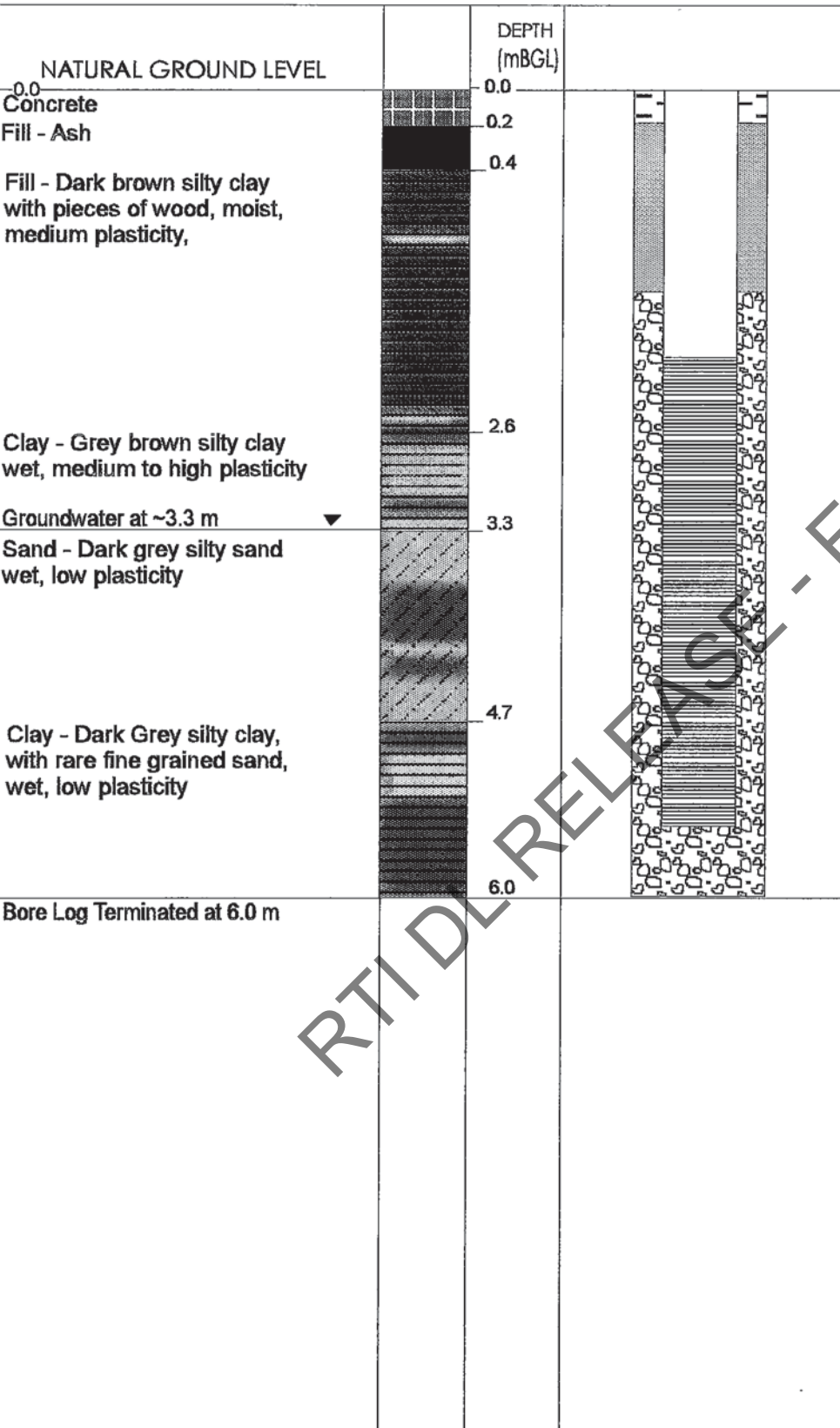
BORE HOLE DETAILS - BH8

New Farm Power Station ESA

STRATIGRAPHIC DESCRIPTION LOG

WELL CONSTRUCTION

DETAILS



GENERAL INFORMATION

LOCATION: Lamington Road, New Farm.

DATE DRILLED: 6 March 1998

EQUIPMENT USED

Drilling Company:
Paddy Christensen & Son
Drilling Rig with
120 mm solid stem auger.

Well Construction Details
50 mm Class 18 threaded, slotted, acid washed, PVC screen from 2.0 to 5.0 m BGL. Filter sand from 1.5 m BGL to 6.0 m BGL, bentonite seal from 0.1 m to 1.5 mBGL. Concrete pad and flush mount from ground surface to 0.1 mBGL. Lockable cap.

PID READINGS

DEPTH(mBGL)	PID (ppm)
0.5	0.0
1.0	0.0
2.0	0.0
3.0	0.0
4.0	0.0
5.0	0.0
6.0	0.0

BOREHOLE BH8

PPK
Environment & Infrastructure

JOB NO. 84K043A DRG. NO. BH8
Page 38

Logged By: [Personal information]

Sampled By: [Personal information]

Field Classification

- 0 No obvious contamination
- 1 Slight visual contamination and/or slight odour
- 2 Visual contamination and/or odour
- 3 Gross visual contamination and/or strong odour

Notes

RTI DL RELEASE - EHP

Appendix D

Summary of Analytical Results

Table D1 - Summary of Soil Analytical Results (TPH and Phenols)

Bore ID	Sample ID	Date Sampled	Depth (mBGL)	PID Screen (ppm)	TPH C ₆ -C ₉	TPH C ₁₀ -C ₁₄	TPH C ₁₅ -C ₂₈	TPH C ₂₉ -C ₃₆	Total TPH	Total Phenols
BH7	BH7;2.5-2.7	9-3-98	2.5-2.7	0.0	nd	nd	nd	nd	nd	nd
BH7	BH7;4.0	9-3-98	4.0	0.0	nd	nd	nd	nd	nd	-
BH7	BH7;7.0*	9-3-98	7.0	0.0	nd	nd	nd	nd	nd	-
BH6	BH6;2.0	6-3-98	2.0	0.0	nd	nd	nd	nd	nd	-
BH3	BH3;3.0	6-3-98	3.0	0.0	nd	nd	nd	nd	nd	-
BH6	BH6;0.5	6-3-98	0.5	0.0	nd	22	274	866	1160	nd
BH3	BH3;0.5	6-3-98	0.5	0.0	nd	nd	nd	nd	nd	2.5
BH8	BH8;0.2-0.4	6-3-98	0.2-0.4	0.0	nd	41	404	1410	1860	nd
BH4	BH4;3.0	6-3-98	3.0	0.0	nd	nd	nd	nd	nd	-
BH4	BH4;0.3-0.5	6-3-98	0.3-0.5	0.0	nd	nd	nd	242	242	nd
BH8	BH8;3.0	6-3-98	3.0	0.0	nd	nd	nd	nd	nd	6.1
BH5	BH5;1.0	6-3-98	1.0	0.0	nd	nd	nd	nd	nd	-
BH5	BH5;3.0	6-3-98	3.0	0.0	nd	nd	nd	nd	nd	nd
BH2	BH2;0.5-0.7	4-3-98	0.5-0.7	0.0	nd	nd	nd	335	335	-
BH2	BH2;3.0	4-3-98	3.0	0.0	nd	nd	nd	nd	nd	0.3
Queensland DoE				100	100	100	1000	1000	1000	NC
NEHF Health Based (Recreational)				NC	NC	NC	NC	NC	NC	17000
NEHF Health Based (Commercial)				NC	NC	NC	NC	NC	NC	42500

Notes: All values given in mg/kg on a dry weight basis
Proposed SAHC/NEHF Health Based Soil Investigation Levels (Health Risk Assessment and Management of Contaminated Sites, Monograph No. 5, 1996)
Results in **bold** indicate levels exceeding DoE criteria
* Field Duplicate submitted for analysis of BH 7; 4.0
nd indicates analyte not detected above Limit of Detection
NC indicates no current regulatory criteria for the analyte tested
- indicates analyte not tested in this sample

Table D2 - Summary of Soil Analytical Results (Polycyclic Aromatic Hydrocarbons)

Bore ID	Sample ID	Date Sampled	Depth (mBGL)	NAP	ACY	ACE	FLU	PHE	ANT	FLA	PYR	BAA	CHR	B(B&K)F	BAP	DBA	BGP	IPY	Total
BH7	BH7;2.5-2.7	9-3-98	2.5-2.7	nd	nd	nd	nd	0.8	nd	2.1	1.9	0.9	1.1	2.0	0.7	nd	0.5	0.6	10.4
BH3	BH3;3.0	6-3-98	3.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-
BH6	BH6;0.5	6-3-98	0.5	nd	nd	nd	nd	1.3	nd	2.2	1.9	0.9	1.0	2.0	0.6	nd	0.6	0.7	11.0
BH3	BH3;0.5	6-3-98	0.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-
BH8	BH8;0.2-0.4	6-3-98	0.2-0.4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-
BH4	BH4;0.3-0.5	6-3-98	0.3-0.5	nd	nd	nd	nd	0.5	nd	1.1	1.1	0.5	0.6	1.0	nd	nd	0.5	0.6	6.2
BH5	BH5;3.0	6-3-98	3.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-
BH2	BH2;3.0	4-3-98	3.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-
Queensland DoE				NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	NC	20
NEHF Health Based (Recreational)				NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2	NC	NC	NC	40
NEHF Health Based (Commercial)				NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	5	NC	NC	NC	100

Notes: All values given in mg/kg on a dry weight basis
Proposed SAHC/NEHF Health Based Soil Investigation Levels (Health Risk Assessment and Management of Contaminated Sites, Monograph No. 5, 1996)
Results in **bold** indicate levels exceeding DoE criteria
nd indicates analyte not detected above Limit of Detection
NC indicates no current regulatory criteria for the analyte tested
- indicates analyte not tested in this sample

PAH Nomenclature

NAP	Naphthalene	PHE	Phenanthrene	BAA	Benzo (a) anthracene	BAP	Benzo (a) pyrene
ACY	Acenaphthylene	ANT	Anthracene	CHR	Chrysene	DBA	Dibenzo (a,h) anthracene
ACE	Acenaphthene	FLA	Fluoranthene	B(B&K)F	Benzo (b) fluoranthene	BGP	Benzo (g,h,i) perylene
FLU	Fluorene	PYR	Pyrene			IPY	Indeno (1,2,3 - cd) pyrene

Table D3 - Summary of Soil Analytical Results (Metals)

Bore ID	Sample ID	Date Sampled	Depth (mBGL)	Arsenic	Cadmium	Chromium	Copper	Nickel	Lead	Zinc	Mercury
BH7	BH7;2.5-2.7	9-3-98	2.5-2.7	nd	nd	22	17	13	16	45	0.08
BH7	BH7;4.0	9-3-98	4.0	nd	nd	30	29	20	9	55	nd
BH7	BH7;7.0*	9-3-98	7.0	6	nd	32	21	23	9	58	nd
BH6	BH6;2.0	6-3-98	2.0	nd	nd	31	15	21	8	46	0.12
BH3	BH3;3.0	6-3-98	3.0	6	nd	27	18	12	7	45	nd
BH6	BH6;0.5	6-3-98	0.5	nd	nd	nd	32	9	9	36	nd
BH3	BH3;0.5	6-3-98	0.5	nd	nd	38	19	22	8	53	nd
BH8	BH8;0.2-0.4	6-3-98	0.2-0.4	nd	nd	nd	28	8	10	49	nd
BH4	BH4;3.0	6-3-98	3.0	nd	nd	29	12	11	6	33	nd
BH4	BH4;0.3-0.5	6-3-98	0.3-0.5	nd	nd	10	28	14	17	50	nd
BH8	BH8;3.0	6-3-98	3.0	5	nd	33	18	20	11	62	nd
BH5	BH5;1.0	6-3-98	1.0	nd	nd	32	80	24	6	79	nd
BH5	BH5;3.0	6-3-98	3.0	nd	nd	29	17	5	nd	24	nd
BH2	BH2;0.5-0.7	4-3-98	0.5-0.7	nd	nd	6	41	nd	99	47	0.07
BH2	BH2;3.0	4-3-98	3.0	5	nd	34	18	9	39	31	nd
Queensland DoE				20	3	50	60	60	300	200	1
NEHF Health Based (Recreational)				200	40	III - 24% VI - 200	2000	600	600	14000	30
NEHF Health Based (Commercial)				500	100	III - 60% VI - 500	5000	3000	1500	35000	75

Notes: All values given in mg/kg on a dry weight basis
Proposed SAHC/NEHF Health Based Soil Investigation Levels (Health Risk Assessment and Management of Contaminated Sites, Monograph No. 5, 1996)
Results in **bold** indicate levels exceeding DoE criteria
* Field Duplicate submitted for analysis of BH 7; 4.0
nd indicates analyte not detected above Limit of Detection
NC indicates no current regulatory criteria for the analyte tested

Table D4. VOC results using Headspace Analysis for Soil Bores (in ppm)

Soil Bore ID	Depth (mBGL)						
	0.5	1.0	2.0	3.0	4.0	5.0	6.0
BH1	-	-	-	-	-	-	-
BH2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BH3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BH4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BH5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BH6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BH7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BH8	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Notes: mBGL (metres below ground level)
- Indicates reading not taken

RTI DL RELEASE - EHP

Table D5 - Summary of Groundwater Analytical Results (TPH)

Sample	Date Sampled	TPH C ₆ -C ₉	TPH C ₁₀ -C ₁₄	TPH C ₁₅ -C ₂₈	TPH C ₂₉ -C ₃₆	TPH
BH3	13/3/98	nd	nd	nd	nd	nd
BH6	13/3/98	nd	nd	nd	nd	nd
BH8	13/3/98	nd	nd	nd	nd	nd
BH10*	13/3/98	nd	nd	nd	nd	nd
ANZECC Guidelines		NC	NC	NC	NC	NC
Dutch Intervention Values			600			600

Notes: All results stated in µg/L unless otherwise specified
Results shaded indicate levels exceeding ANZECC Guidelines for Fresh Waters
Results in **bold** indicates levels exceeding Dutch Intervention Values
* Indicates field rinsate blank
nd Indicates analyte not detected above Limit of Detection
NC Indicates no current regulatory criteria for the analyte tested

Table D6 - Summary of Groundwater Analytical Results (Metals)

Sample	Date Sampled	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
BH3	13/3/98	3	nd	5	9	5	nd	5	27
BH6	13/3/98	3	nd	7	9	9	nd	9	147
BH8	13/3/98	8	nd	23	33	22	nd	22	115
BH10*	13/3/98	nd	nd	nd	4	2	nd	2	37
ANZECC Guidelines (Fresh)		50	0.2-2.0	10	0.2-5.0	1.0-5.0	0.1	15-50	5-50
ANZECC Guidelines (Marine)		50	2	50	5	15	0.1	15	50
Dutch Intervention Value		60	6	30	75	75	0.3	75	800

Notes: All results stated in µg/L unless otherwise specified
Results shaded indicate levels exceeding ANZECC Guidelines for Fresh Waters
Results in **bold** indicates levels exceeding Dutch Intervention Values
* Indicates field rinsate blank
nd Indicates analyte not detected above Limit of Detection
NC Indicates no current regulatory criteria for the analyte tested

Table D7 - Summary of Groundwater Analytical Results (Polycyclic Aromatic Hydrocarbons)

Bore ID	Date Sampled	NAP	ACY	ACE	FLU	PHE	ANT	FLA	PYR	BAA	CHR	B(B&K)F	BAP	DBA	BGP	IPY	Total
BH3	13/3/98	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH6	13/3/98	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH8	13/3/98	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH10*	13/3/98	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
ANZECC Guidelines		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	3.0
Dutch Intervention Guidelines		70	NC	NC	NC	NC	5	1	NC	0.5	0.05	0.05	0.05	NC	0.05	0.05	NC

Notes: All results stated in µg/L unless otherwise specified
Results shaded indicate levels exceeding ANZECC Guidelines for Fresh Waters
Results in **bold** indicates levels exceeding Dutch Intervention Values
* Indicates field rinsate blank
nd Indicates analyte not detected above Limit of Detection
NC Indicates no current regulatory criteria for the analyte tested

PAH Nomenclature

NAP	Naphthalene	PHE	Phenanthrene	BAA	Benzo (a) anthracene	BAP	Benzo (a) pyrene
ACY	Acenaphthylene	ANT	Anthracene	CHR	Chrysene	DBA	Dibenzo (a,h) anthracene
ACE	Acenaphthene	FLA	Fluoranthene	B(B&K)F	Benzo (b) fluoranthene	BGP	Benzo (g,h,i) perylene
FLU	Fluorene	PYR	Pyrene	BKF	Benzo (k) fluoranthene	IPY	Indeno (1,2,3 - cd) pyrene

Appendix E

Returned Chain of Custody and Final Laboratory Certificates

ENVIRONMENTAL AND INDUSTRIAL SERVICES DIVISION

Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

CERTIFICATE OF ANALYSIS

Contents :

- 1) Cover Page
- 2) Analysis Report Pages
- 3) QA/QC Appendix

REPORT No : 8B00074
ATTENTION : Mr Chris Woodfull
CLIENT : PPK Brisbane
SAMPLES : 15
REFERENCE : 84K043A/1928
DATE RECEIVED : 09/03/98
DATE REPORTED : 17/03/98

<u>Method</u>	<u>Description</u>
E1042	Moisture (%w/w)
E084	Total Petroleum Hydrocarbons
E092	Polynuclear Aromatic Hydrocarbons
M340S	Metals by ICP-AES
M350S	Mercury in Soil
E1032	Total Phenolics as phenol

RESULTS

All samples were analysed as received. This report relates specifically to the samples received. Results relate to the source material only to the extent that the samples as supplied are truly representative of the sample source. This report replaces any preliminary results issued. Note that for schemes indicated with * NATA registration does not cover the performance of this service.

PLEASE SEE ATTACHED PAGES FOR RESULTS

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

Job Number : 8B00074

Client : PPK Brisbane

Reference : 84K043A/1928

Page 1 of 6

plus Cover Page

Analyte	Lab No	E48913	E48914	E48915	E48916	E48917
		BH7;2.5-				
	Sample Id	2.7	BH7;4.0	BH7;7.0	BH6;2.0	BH3;3.0
	PQL					
E1042 Moisture Content %(w/w)	1	20	30	35	16	32
E084 TPH in Soil						
TPH C6-C36 as C8	-	nd	nd	nd	nd	nd
C6-C9 Fraction	10	nd	nd	nd	nd	nd
C10-C14 Fraction	20	nd	nd	nd	nd	nd
C15-C28 Fraction	100	nd	nd	nd	nd	nd
C29-C36 Fraction	100	nd	nd	nd	nd	nd
M340S Metals in Soil						
Arsenic	5	nd	nd	6	nd	6
Cadmium	1	nd	nd	nd	nd	nd
Chromium	5	22	30	32	31	27
Copper	5	17	29	21	15	18
Nickel	5	13	20	23	21	12
Lead	5	16	9	9	8	7
Zinc	5	45	55	58	46	45
Mercury in Soil	0.05	0.08	nd	nd	0.12	nd
E1032 Tot. Phenolics as phenol	0.1	nd	--	--	--	--

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = Not Detected (<PQL)

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified

Leachates : mg/L (ppm) in leachate

Approved
1/14/08

Job Number : 8B00074
Client : PPK Brisbane
Reference : 84K043A/1928

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plus Cover Page

Analyte	Lab No	E48918	E48919	E48920	E48921	E48922
				BH8;0.2-		BH4;0.3-
	Sample Id	BH6;0.5	BH3;0.5	0.4	BH4;3.0	0.5
	PQL					
E1042 Moisture Content %(w/w)	1	23	23	23	23	19
E084 TPH in Soil						
TPH C6-C36 as C8	-	1160	nd	1860	nd	242
C6-C9 Fraction	10	nd	nd	nd	nd	nd
C10-C14 Fraction	20	22	nd	41	nd	nd
C15-C28 Fraction	100	274	nd	404	nd	nd
C29-C36 Fraction	100	866	nd	1410	nd	242
M340S Metals in Soil						
Arsenic	5	nd	nd	nd	nd	nd
Cadmium	1	nd	nd	nd	nd	nd
Chromium	5	nd	38	nd	29	10
Copper	5	32	19	28	12	28
Nickel	5	9	22	8	11	14
Lead	5	9	8	10	6	17
Zinc	5	36	53	49	33	50
Mercury in Soil	0.05	nd	nd	nd	nd	nd
E1032 Tot. Phenolics as phenol	0.1	nd	2.5	nd	--	nd

PQL = Practical Quantitation Limit
LNR = Samples Listed not Received
nd = Not Detected (<PQL)
-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
Waters : mg/L (ppm) unless otherwise specified
Leachates : mg/L (ppm) in leachate

Job Number : 8B00074
 Client : PPK Brisbane
 Reference : 84K043A/1928

Page 3 of 6
 plus Cover Page

Analyte	Lab No	E48923	E48924	E48925	E48926	E48927
					BH2;0.5-	
	Sample Id	BH8;3.0	BH5;1.0	BH5;3.0	0.7	BH2;3.0
	PQL					
E1042 Moisture Content %(w/w)	1	38	17	28	19	22
E084 TPH in Soil						
TPH C6-C36 as C8	-	nd	nd	nd	335	nd
C6-C9 Fraction	10	nd	nd	nd	nd	nd
C10-C14 Fraction	20	nd	nd	nd	nd	nd
C15-C28 Fraction	100	nd	nd	nd	nd	nd
C29-C36 Fraction	100	nd	nd	nd	335	nd
M340S Metals in Soil						
Arsenic	5	5	nd	nd	nd	5
Cadmium	1	nd	nd	nd	nd	nd
Chromium	5	33	32	29	6	34
Copper	5	18	80	17	41	18
Nickel	5	20	24	5	nd	9
Lead	5	11	6	nd	99	39
Zinc	5	62	79	24	47	31
Mercury in Soil	0.05	nd	nd	nd	0.07	nd
E1032 Tot. Phenolics as phenol	0.1	6.1	--	nd	--	0.3

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Not Detected (<PQL)
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 8B00074
 Client : PPK Brisbane
 Reference : 84K043A/1928

Analyte	Lab No	CB				
		CONTROL				
	Sample Id	BLANK				
	PQL					
E1042 Moisture Content %(w/w)	1					
E084 TPH in Soil						
TPH C6-C36 as C8	-	nd				
C6-C9 Fraction	10	nd				
C10-C14 Fraction	20	nd				
C15-C28 Fraction	100	nd				
C29-C36 Fraction	100	nd				
M340S Metals in Soil						
Arsenic	5	nd				
Cadmium	1	nd				
Chromium	5	nd				
Copper	5	nd				
Nickel	5	nd				
Lead	5	nd				
Zinc	5	nd				
Mercury in Soil	0.05	nd				
E1032 Tot. Phenolics as phenol	0.1	nd				

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Not Detected (<PQL)
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 8B00074
 Client : PPK Brisbane
 Reference : 84K043A/1928

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 plus Cover Page

Analyte	Lab No	E48913	E48917	E48918	E48919	E48920
		BH7;2.5-				BH8;0.2-
	Sample Id	2.7	BH3;3.0	BH6;0.5	BH3;0.5	0.4
	PQL					
E092 PAH's in Soil						
Naphthalene	0.5	nd	nd	nd	nd	nd
Acenaphthylene	0.5	nd	nd	nd	nd	nd
Acenaphthene	0.5	nd	nd	nd	nd	nd
Fluorene	0.5	nd	nd	nd	nd	nd
Phenanthrene	0.5	0.8	nd	1.3	nd	nd
Anthracene	0.5	nd	nd	nd	nd	nd
Fluoranthene	0.5	2.1	nd	2.2	nd	nd
Pyrene	0.5	1.9	nd	1.9	nd	nd
Benzo(a)anthracene	0.5	0.9	nd	0.9	nd	nd
Chrysene	0.5	1.1	nd	1.0	nd	nd
Benzo(b)&(k)fluoranthene	1	2	nd	2	nd	nd
Benzo(a)pyrene	0.5	0.7	nd	0.6	nd	nd
Indeno(1.2.3-cd)pyrene	0.5	0.6	nd	0.7	nd	nd
Dibenz(a,h)anthracene	0.5	nd	nd	nd	nd	nd
Benzo(g,h,i)perylene	0.5	0.5	nd	0.6	nd	nd
Total PAHs Measureable	-	10.4	nd	11.0	nd	nd
Surrogate % Recovery	-	--	--	--	--	--
2-Fluorobiphenyl	-	101	107	100	97	103
d14-Terphenyl	-	122	123	128	113	124

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Not Detected (<PQL)
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 8B00074
 Client : PPK Brisbane
 Reference : 84K043A/1928

Page 6 of 6
 plus Cover Page

Analyte	Lab No	E48922	E48925	E48927	CB	
		BH4;0.3-			CONTROL	
	Sample Id	0.5	BH5;3.0	BH2;3.0	BLANK	
	PQL					
E092 PAH's in Soil						
Naphthalene	0.5	nd	nd	nd	nd	
Acenaphthylene	0.5	nd	nd	nd	nd	
Acenaphthene	0.5	nd	nd	nd	nd	
Fluorene	0.5	nd	nd	nd	nd	
Phenanthrene	0.5	0.5	nd	nd	nd	
Anthracene	0.5	nd	nd	nd	nd	
Fluoranthene	0.5	1.1	nd	nd	nd	
Pyrene	0.5	1.1	nd	nd	nd	
Benzo(a)anthracene	0.5	0.5	nd	nd	nd	
Chrysene	0.5	0.6	nd	nd	nd	
Benzo(b)&(k)fluoranthene	1	1	nd	nd	nd	
Benzo(a)pyrene	0.5	nd	nd	nd	nd	
Indeno(1.2.3-cd)pyrene	0.5	0.6	nd	nd	nd	
Dibenz(a,h)anthracene	0.5	nd	nd	nd	nd	
Benzo(g,h,i)perylene	0.5	0.5	nd	nd	nd	
Total PAHs Measureable	-	6.2	nd	nd	nd	
Surrogate % Recovery	-	--	--	--	--	
2-Fluorobiphenyl	-	101	101	101	108	
d14-Terphenyl	-	128	115	116	122	

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Not Detected (<PQL)
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

QA/QC APPENDIX NO. 8B00074

<u>Method</u>	<u>Description</u>
E084	Total Petroleum Hydrocarbons
E092	Polynuclear Aromatic Hydrocarbons
M340S	Metals by ICP-AES
M350S	Mercury in Soil
E1032	Total Phenolics as phenol

Chromatography QA/QC

	Yes	No	N/A
Retention Time Window Within Acceptance Criteria($\pm 2\%$)	✓		
Check Standard Within Acceptance Criteria($\pm 10\%$)	✓		
Recalibration Within Acceptance Criteria($\pm 15\%$)	✓		

Other QA/QC

Holding time conforming With Method Specification	✓
Chain of Custody Attached	✓

N/A=Not Applicable

Comments

1. Laboratory QA/QC including Duplicates, Matrix Spike Duplicates, and check/reference samples are included in this QA/QC appendix. (Where applicable)
2. Inter-Laboratory proficiency trial results available on request. (Where applicable)
3. Surrogate description and recoveries are recorded in the Report. (Where applicable)
4. Acceptance criteria for specific analytes are listed on each QA/QC page.
5. Practical Quantitation Limit (PQL is typically 2-10 x method detection limit (MDL)).
6. PQL's are matrix dependent and are increased accordingly where sample extracts are diluted.
7. Results are uncorrected for matrix spike or surrogate recoveries.

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

QAQC : Matrix Spike / Check Solution

Analyte	Level (ppm)	Level Detected		Recovery Details			
		Result1 (ppm)	Result2 (ppm)	Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
E084 TPH in Soil							
TPH C6-C36 as C8	950	850	855	89%	90%	90%	1%
C6-C9 Fraction	400	310	315	78%	79%	78%	2%
C15-C28 Fraction	550	540	540	98%	98%	98%	0%
M340S Metals in Soil							
Arsenic	50	45	45	90%	90%	90%	0%
Cadmium	50	45	45	90%	90%	90%	0%
Chromium	50	47	47	94%	94%	94%	0%
Copper	50	48	47	96%	94%	95%	2%
Nickel	50	45	45	90%	90%	90%	0%
Lead	50	46	45	92%	90%	91%	2%
Zinc	50	45	45	90%	90%	90%	0%
Mercury in Soil	0.50	0.61	0.60	122%	120%	121%	2%
E1032 Tot. Phenolics as phenol	11	12.5		114%			

PQL = Practical Quantitation Limit

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm)

nd = Not Detected
-- = Not Applicable

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 4th Edition 1/7/97

QAQC : Duplicates

Analyte	PQL	Dupl 1	Dupl 2	Average	RPD (%)
E084 TPH in Soil					
TPH C6-C36 as C8	-	nd	nd		
C6-C9 Fraction	10	nd	nd		
C10-C14 Fraction	20	nd	nd		
C15-C28 Fraction	100	nd	nd		
C29-C36 Fraction	100	nd	nd		
M340S Metals in Soil					
Arsenic	5	nd	nd		
Cadmium	1	nd	nd		
Chromium	5	22	22	22	0%
Copper	5	17	17	17	0%
Nickel	5	13	13	13	0%
Lead	5	18	16	17	11%
Zinc	5	47	45	46	4%
Mercury in Soil	0.05	0.10	0.08	0.09	22%

PQL = Practical Quantitation Limit

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/L (ppm)

nd = Not Detected
-- = Not Applicable

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 4th Edition 1/7/97

[illegible]

Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCB's	Metals**	Total Phenols
5				✓	✓	✓	✓	✓	✓



Environment & Infrastructure
A.C.N. 058 381 507

Yellow Page - Project File Copy
Green Page - Remains in Book

services to the office indicated:

☐ Adelaide
100 North Terrace, Adelaide S.A. 5000
Tel: (08) 8405 4300 Fax: (08) 8212 4686

☐ Melbourne
163 Eastern Road, South Melbourne Vic. 3205
Tel: (03) 9686 1166 Fax: (03) 9686 1110

☐ Sydney
9 Blaxland Road, Rhodes N.S.W. 2138
Tel: (02) 9743 0333 Fax: (02) 9736 1568

Order No: 1932

Job Title: Contaminated Site Assessment New Farm Power Station
Laboratory Name: AMDEL
Address:

Rust PPK Job Number:

84K043A
Amadel #
8B0074

Job Location:

New Farm

Project Manager:

Chris Woodford

Results Expected by/on: 16-3-98

Fax Results to: Joe Feltham

Fax Number: 38314223

Phone Number: 32182214

Spreadsheet of Results Required: (Y) N

Format: Excel

Turnaround Time Required: 3-5 days

Invoice to: PPK

Comments: Please email results

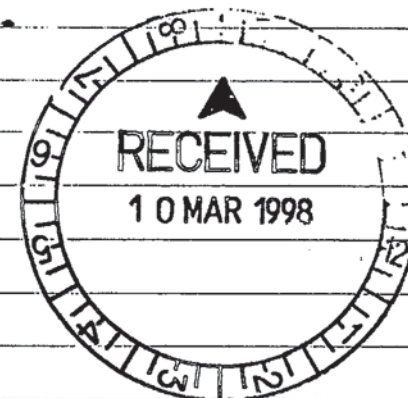
Fax Number:
Phone Number: 3369 5555
Contact Name: Bill Stanopoulos
Delivery Method:
Quote Number:

Date Sampled	Time	Sample I.D.	Container Size	Sample Location
<u>4-3-98</u>		<u>BH2; 3.0</u> <u>BH2; 4.0</u> <u>BH2; 5.0</u> <u>BH2; 6.0</u>		

Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCBs	Metals**	Total Phenols
<u>3</u>			<u>✓</u>	<u>✓</u>			<u>✓</u>	

sch4p4(6) Personal Information

Initials	Comments/Additional Information and/or Analysis Required
<u>↓</u>	<u>} Hold</u>



Relinquished by: Joe Feltham
Date & Time: 9-3-98 11:00
Company: PPK
Signature: sch4p4(6) Personal Information

Received in Good Order
Condition by (Name):
Date & Time:
Company: RTI 13-106
Signature:

Relinquished by: K. Goodall
Date & Time: 9/3/98 12:30
Company: Amadel
Signature: sch4p4(6) Personal Information

Received in Good Order
& Condition by (Name):
Date & Time: 8-30 10/3
Company:
Signature: sch4p4(6) Personal Information

Relinquished by:
Date & Time:
Company:
Signature:

Received in Good Order
& Condition by (Name):
Date & Time:
Company:
Signature:

Medium*: (S) Soil, W = Water, V = Vapour

Legend**: (circle the following to be tested)

Metals: Al (As) Be (Cd) Co (Cr) Cu (Fe) (Hg)
Li Mg Mn (Ni) (Pb) Se Sn V (Zn)

Samples on Ice: ☒ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory

ENVIRONMENTAL AND INDUSTRIAL SERVICES DIVISION

Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

CERTIFICATE OF ANALYSIS

Contents :

- 1) Cover Page
- 2) Analysis Report Pages
- 3) QA/QC Appendix

REPORT No : 8B00083
ATTENTION : Mr Chris Woodfull
CLIENT : PPK Brisbane
SAMPLES : 4
REFERENCE : 84K043A/1933/1934
DATE RECEIVED : 16/03/98
DATE REPORTED : 20/03/98

<u>Method</u>	<u>Description</u>
E083	Total Petroleum Hydrocarbons
E091	Polynuclear Aromatic Hydrocarbons
W047	Total Phenolics
M370WD	Dissolved Metals by ICP-MS
M350WD	Mercury

RESULTS

All samples were analysed as received. This report relates specifically to the samples received.
Results relate to the source material only to the extent that the samples as supplied are truly representative of the sample source. This report replaces any preliminary results issued.
Note that for schemes indicated with * NATA registration does not cover the performance of this service.

PLEASE SEE ATTACHED PAGES FOR RESULTS

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

Job Number : 8B00083

Client : PPK Brisbane

Reference : 84K043A/1933/1934

Page 1 of 2
plus Cover Page

Analyte	Lab No	E49458	E49459	E49460	E49461	CB
						CONTROL
	Sample Id	BH3	BH6	BH8	BH10	BLANK
	PQL					
E083 TPH in Water						
TPH C6-C36 as C8	-	nd	nd	nd	nd	nd
C6-C9 Fraction	0.02	nd	nd	nd	nd	nd
C10-C14 Fraction	0.04	nd	nd	nd	nd	nd
C15-C28 Fraction	0.2	nd	nd	nd	nd	nd
C29-C36 Fraction	0.2	nd	nd	nd	nd	nd
W047 Phenolics as Phenols	0.01	nd	nd	nd	nd	nd
Dissolved Metals in Waters						
Arsenic	0.001	0.003	0.003	0.008	nd	nd
Cadmium	0.0005	nd	nd	nd	nd	nd
Chromium	0.001	0.005	0.007	0.023	nd	nd
Copper	0.001	0.009	0.009	0.033	0.004	nd
Nickel	0.001	0.006	0.044	0.028	0.001	nd
Lead	0.001	0.005	0.009	0.022	0.002	nd
Zinc	0.002	0.027	0.147	0.115	0.037	nd
M350 Mercury in Water	0.001	nd	nd	nd	nd	nd

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = Not Detected (<PQL)

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified

Leachates : mg/L (ppm) in leachate

sch4p4(6) Personal information

Approved
1/4/98

Job Number : 8B00083
Client : PPK Brisbane
Reference : 84K043A/1933/1934

Analyte	Lab No	E49458	E49459	E49460	E49461	CB
						CONTROL
	Sample Id	BH3	BH6	BH8	BH10	BLANK
	PQL					
E091 PAH's in Water						
Naphthalene	0.001	nd	nd	nd	nd	nd
Acenaphthylene	0.001	nd	nd	nd	nd	nd
Acenaphthene	0.001	nd	nd	nd	nd	nd
Fluorene	0.001	nd	nd	nd	nd	nd
Phenanthrene	0.001	nd	nd	nd	nd	nd
Anthracene	0.001	nd	nd	nd	nd	nd
Fluoranthene	0.001	nd	nd	nd	nd	nd
Pyrene	0.001	nd	nd	nd	nd	nd
Benzo(a)anthracene	0.001	nd	nd	nd	nd	nd
Chrysene	0.001	nd	nd	nd	nd	nd
Benzo(b)&(k)fluoranthene	0.002	nd	nd	nd	nd	nd
Benzo(a)pyrene	0.001	nd	nd	nd	nd	nd
Indeno(1.2.3-cd)pyrene	0.001	nd	nd	nd	nd	nd
Dibenz(a,h)anthracene	0.001	nd	nd	nd	nd	nd
Benzo(g,h,i)perylene	0.001	nd	nd	nd	nd	nd
Total PAHs Measureable	-	nd	nd	nd	nd	nd
Surrogate % Recovery	-	109	107	90.0	116	111

PQL = Practical Quantitation Limit
LNR = Samples Listed not Received
nd = Not Detected (<PQL)
-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
Waters : mg/L (ppm) unless otherwise specified
Leachates : mg/L (ppm) in leachate

QA/QC APPENDIX NO. 8B00083

Method Description

E083 Total Petroleum Hydrocarbons
 E091 Polynuclear Aromatic Hydrocarbons
 W047 Total Phenolics
 M370WD Dissolved Metals by ICP-MS
 M350WD Mercury

Chromatography QA/QC

	Yes	No	N/A
Retention Time Window			
Within Acceptance Criteria($\pm 2\%$)	✓		
Check Standard Within			
Acceptance Criteria($\pm 10\%$)	✓		
Recalibration Within			
Acceptance Criteria($\pm 15\%$)	✓		

Other QA/QC

Holding time conforming	
With Method Specification	✓
Chain of Custody Attached	✓

N/A=Not Applicable

Comments

1. Laboratory QA/QC including Duplicates, Matrix Spike Duplicates, and check/reference samples are included in this QA/QC appendix. (Where applicable)
2. Inter-Laboratory proficiency trial results available on request. (Where applicable)
3. Surrogate description and recoveries are recorded in the Report. (Where applicable)
4. Acceptance criteria for specific analytes are listed on each QA/QC page.
5. Practical Quantitation Limit (PQL is typically 2-10 x method detection limit (MDL)).
6. PQL's are matrix dependent and are increased accordingly where sample extracts are diluted.
7. Results are uncorrected for matrix spike or surrogate recoveries.

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

QAQC : Matrix Spike / Check Solution

Analyte	Level (ppm)	Level Detected		Recovery Details			
		Result1 (ppm)	Result2 (ppm)	Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
E083 TPH in Water							
TPH C6-C36 as C8	9.5	7.5	7.6	79%	80%	79%	1%
C6-C9 Fraction	4.0	2.90	2.90	73%	73%	73%	0%
C15-C28 Fraction	5.5	4.6	5.2	84%	95%	89%	12%
W047 Phenolics as Phenols	1.0	0.92		92%			
Dissolved Metals in Waters							
Arsenic	0.100	0.106	0.106	106%	106%	106%	0%
Cadmium	0.1000	0.104	0.105	104%	105%	105%	1%
Chromium	0.100	0.101	0.104	101%	104%	103%	3%
Copper	0.100	0.097	0.098	97%	98%	98%	1%
Nickel	0.100	0.099	0.100	99%	100%	100%	1%
Lead	0.100	0.112	0.101	112%	101%	107%	10%
Zinc	0.100	0.102	0.103	102%	103%	103%	1%
M350 Mercury in Water	0.12	0.110	0.110	92%	92%	92%	0%

PQL = Practical Quantitation Limit

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm)

nd = Not Detected
-- = Not Applicable

All results are within the acceptance criteria:
Refer to Amdel-Sydney Quality Control Manual SPM-01 4th Edition 1/7/97

Job Title: **New Farm**
Contaminated Site Assessment - Power Station

Laboratory Name: **AMDEL**

Address: **3/1 Font Lane**
Milton

Fax Number:

Phone Number: **3369 5555**

Contact Name: **Bell Skarropolski**

Delivery Method: **Courier**

Quote Number:

Rust PPK Job Number:

84K043A

AMDEL

8800083

Job Location:

New Farm

Project Manager: **Chris Wood**

Results Expected by/on: **20-3-98**

Fax Results to: **Joe Feltham**

Fax Number: **3631 4223**

Phone Number: **3218 2214**

Spreadsheet of Results Required: ☒ Yes

Format: **Excel**

Turnaround Time Required: **3-5 days**

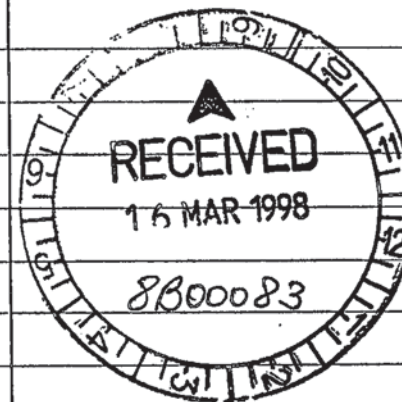
Invoice to: **PPK**

Comments: **Please email results**

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCB's	Metals** + Hg	Total Phenols	Initials	Comments/Additional Information and/or Analysis Required
13-3-98		BH3; 3 ✓	250ml		W							✓			
		BH3; 1 ✓	50ml					✓							
		BH3; 2 ✓	50ml												
		BH3; 4 ✓	1 Litre												
		BH6; 1 ✓	50ml									✓			
		BH6; 2 ✓	"									✓			
		BH6; 3 ✓	250ml									✓			
		BH6; 4 ✓	1 Litre									✓			
		BH8; 1 ✓	50ml					✓							
		BH8; 2 ✓	"									✓			
		BH8; 3 ✓	250ml									✓			
		BH8; 4 ✓	1 Litre									✓			

sch4p4(6) Personal information

High level Metals REH



Relinquished by: **Joe Feltham**

Date & Time: **13/3/98 13:00**

Company: **PPK**

Signature: sch4p4(6) Personal information

Received in Good Order & Condition by (Name):

Date & Time:

Company: **RTI 13-106**

Signature:

Relinquished by: **K. Goodall**

Date & Time: **13/3/98 13:10**

Company: **Amdeu**

Signature: sch4p4(6) Personal information

Received in Good Order & Condition by (Name): **VSINGH**

Date & Time: **14-3-98 8:15am**

Company: **Amdeu**

Signature: sch4p4(6) Personal information

Relinquished by:

Date & Time:

Company:

Signature:

Received in Good Order & Condition by (Name):

Date & Time:

Company: sch4p4(6) Personal information

Signature:

Medium*: S = Soil, ☒ W = Water, V = Vapour

Legend**: (circle the following to be tested)

Metals: Al ☒ Be ☒ Cd ☒ Co ☒ Cr ☒ Cu ☒ Fe ☒ Hg ☒
Li ☒ Mg ☒ Mn ☒ Ni ☒ Pb ☒ Se ☒ Sn ☒ V ☒ Zn ☒

Samples on Ice: ☒ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory

Appendix F

Field Parameters and Purging Volume Sheets

PPK Environment & Infrastructure							SUBJECTIVE ANALYSIS				
Project Name: <i>New Farm Power Station</i>				Job Number: <i>84R043A</i>			Date: <i>12/3/98</i>			Sheet: <i>1</i> of <i>2</i>	
Bore ID	Diameter (mm)	Date	Time	WATER COLUMN Height (mBGL)	Total Depth (mBGL)	Water Depth (mBTOC)	Colour	Odour	Other	Bore Volume (Litres)	Required Purge Volume (Litres)
BH6	120	12/3/98	12:20	1.85	4.98	3.12	Grey Brown	Earthy	-	21 L	21 L
BH3	120	12/3/98	13:00	2.80	5.46	2.66	Grey Brown	Earthy	-	32 L	32 L
BH8	120	12/3/98	14:00	2.43	5.00	2.57	Grey Brown	Earthy	-	28 L	28 L
Bore Volume (in litres) Calculated as: $\text{Volume} = (\pi \cdot D^2) / 4 \cdot (\text{Bore Depth} - \text{SWL})$ {or = (Conversion Factor) * (Bore Depth - SWL)}						Conversion Factors Diameter (D): Conversion Factor: 50mm (2 inch) 20.268 cm2 100mm (4 inch) 81.073 cm2 150mm (6 inch) 182.414 cm2			Attachments: <i>1</i> Includes: Personal information <i>12/3/98</i>		

PPK Environment & Infrastructure

BORE PURGE VOLUME ANALYSIS

Project Name: *New Farm Power Station*

Job Number: *84K049A*

Date: *12-13/3/98*

Sheet: *2 of 2*

Bore ID	Bore Volume (L)	Date	1st Bore Volume				2nd Bore Volume				3rd Bore Volume				Additional Information
			Time	Temp (C)	EC (mS/cm)	pH	Time	Temp (C)	EC (mS/cm)	pH	Time	Temp (C)	EC (mS/cm)	pH	
BH6	21 L	12/3/98	12:20	23.2	26.1	6.50	1400	Dry at 11 Litres			16:30	23.1	25.6	6.24	* Dry at 11 litres (1400) finished volume at 1630
BH6	21 L	13/3/98	10:00	23.0	10.1	5.38	← Sampling								
BH3	32 L	12/3/98	13:00	23.9	6.2	6.87	15:15	23.4	6.3	6.87					Dry after 2 volumes
BH3	32 L	13/3/98	08:30	25.9	4.5	7.37	← Sampling								
BH8	27 L	12/3/98	13:40	24.0	5.6	6.49	15:40	23.3	6.2	6.52	16:10	23.6	7.1	6.60	* Dry after 3 purge volumes
BH8	27 L	13/3/98	09:00	23.6	5.0	8.39	← Sampling								

Note: EC = Electrical Conductivity

Validation Report

Applicant:

City Design, Brisbane City Council
Level 3, T.C. Beirne Centre
Brunswick Street Mall
Fortitude Valley Qld 4006

Legal Description:

Part of Lot 3 on RP210504 and
Unallocated State Land
Parish of North Brisbane
Country of Stanley

Local Authority Area:

Brisbane City Council

Address of Property:

Lamington Road
New Farm Qld 4005

Registered Owner:

Brisbane City Council

Current Zoning:

Special Development Zone

Proposed Zoning:

Special Development Zone

Date of Submission:

21 May 1998

**Environmental Site Assessment
of New Farm Power Station,
New Farm**

Brisbane City Council

**PPK Environment &
Infrastructure Pty Ltd**

348 Edward Street
Brisbane Qld 4000
GPO Box 2907
Brisbane Qld 4001
Australia

September, 1997
84J153B/ PR002A1sr

Telephone + 61 7 3218 2222
Facsimile: + 61 7 3831 4223

ACN 078 004 798

A NATA Certified Quality Company

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Appendix B	Site Layout
Appendix C	Sample Locations (Asbestos, lead paint and PCBs)
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Appendix I	Original Laboratory Results
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Appendix K	Summary of Analytical Results and Statistical Analysis

Executive Summary

PPK Environment & Infrastructure Pty Ltd (PPK) was commissioned by Brisbane City Council to investigate and report on potential site contamination arising from the operation of the New Farm Power Station, New Farm. The purpose of this report is to present and assess the significance of the results of the investigation and provide recommendations for appropriate remedial action, as required.

Site investigation works were undertaken in two phases, a hazardous materials audit and a contaminated site investigation. The objective of the hazardous materials audit, conducted on 28 and 29 July 1997, was to identify the extent of asbestos throughout the site, sample painted areas for the presence of lead based paint and obtain oil samples for PCB analysis.

The contaminated site investigation consisted of the excavation and sampling of ten test pits, carried out between 31 July and 1 August 1997. The locations of eight test pits were based on a 40 metre grid pattern around the perimeter of the site and two test pits were excavated in the area of the now demolished boilerhouse. Three additional soil samples were collected from drains located within the power station building. Three water samples were collected from sumps or depressions containing standing water.

Results of the hazardous substances audit indicated the following:

- Asbestos was present on site in a condition that presents a health risk to workers removing the material.
- Asbestos was present in a soil sample obtained from test pit 10, excavated in the area of fill in the demolished boilerhouse.
- Lead was found in 6 of 7 paint samples submitted for laboratory analysis in concentrations exceeding National Health and Medical Research Council (NH&MRC) guidelines.
- Polychlorinated biphenyls (PCBs) were not reported above detection limits in the samples submitted for laboratory analysis, however, it is likely that PCBs would be present in capacitors in fluorescent light fittings based on the light fittings' age.

Results of the contaminated soil and water investigation indicated the following:

- Site investigation works indicated that 8 of 23 soil samples submitted for laboratory analysis reported selected heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb and or Zn) and/or PAHs in levels greater than accepted DoE or Dutch Intervention guidelines.
- The areas exhibiting the greatest impact on site are the drain sediments inside the turbine room and coal handling area, the area of fill along the southern boundary of the site, the area of fill along the western boundary adjacent to New Farm Park and the area of fill in a backfilled depression adjacent to the boilerhouse (TP2).
- Toxicity characteristic leaching procedure (TCLP) analysis of samples Turbine room 1 East (Turb 1 East) and TP 2; 0.3-0.5 indicated lead and zinc levels in leachate exceeded the acceptance criteria for unlined landfills but were within the limits for lined landfills.
- Three water samples obtained from the turbine room, coal bunker and sump (inside the powerhouse building) contained TPH, Pb and/or Hg at levels in excess of ANZECC and/or Trade Waste Discharge Limits for Brisbane City Council.

Based on the results of this assessment the site contains power station related contaminants in soil and water in excess of the relevant health or environmental guidelines. Further to this, hazardous materials are present on site in concentrations and/or conditions that potentially pose a risk to future workers or users of the site. The site is being considered for redevelopment for public use, and consequently the above issues require addressing prior to redevelopment.

The following recommendations to facilitate redevelopment may be made:

- ▣ Prior to any demolition, removal works and/or remedial works, a comprehensive workplace health and safety plan be developed.
- ▣ Friable asbestos material be removed from site by a licensed asbestos removalist and disposed of at an approved landfill, in accordance with all statutory and legislative requirements.
- ▣ Airborne fibre monitoring during and after removal of asbestos material and final visual inspection (to be conducted by suitably qualified occupational hygienist).
- ▣ Further air sampling of the indoor air environment to determine airborne lead paint concentrations.
- ▣ Interim measures for mitigating the exposure to lead particulates such as encapsulating the material and final removal of lead based paint to be undertaken by a suitably qualified contractor in accordance with the draft Australian Standard DR97003.
- ▣ Suspected PCB capacitors be removed from light fittings and disposed of in accordance with all relevant statutory requirements.
- ▣ A health risk assessment be conducted for selected parameters and pathways to assist in the development of appropriate remedial strategies for impacted soil material. Remedial strategies may include capping and/or limited excavation and disposal.
- ▣ Further investigation to delineate the extent of contamination in areas which may require remedial works (eg TP2).
- ▣ Assessment of groundwater conditions and potential impacts to nearby aquatic eco-systems.
- ▣ Disposal of contaminated drain sediments and the fill adjacent to the boilerhouse (TP2) to a lined landfill be undertaken in accordance with all statutory requirements. A Section 14 Approval for the Transport and Disposal of Contaminated Material is required for this work.
- ▣ Contaminated surface waters to be collected by a suitably licensed liquid waste disposal contractor, treated and disposed of at a licensed treatment facility. Alternatively, on site treatment of the water to a level meeting Trade Waste Discharge Limits may be undertaken prior to discharge to sewer.

1. Introduction

PPK Environment & Infrastructure Pty Ltd (PPK) was commissioned by Brisbane City Council to investigate and report on potential soil impacts and hazardous materials present at the decommissioned New Farm Power Station.

The site is being considered for redevelopment for public use and the health risks associated with the site need to be assessed prior to redevelopment occurring. The scope of works for the hazardous materials audit and the soil investigation reported herein were detailed in the PPK proposal dated July 1997 (referenced 84JP153). A summary of the objectives is as follows:

- Identify the presence of asbestos materials and develop a building register outlining the location, amount and type of asbestos encountered.
- Identify the presence of polychlorinated biphenyls (PCBs) and develop appropriate disposal options if required.
- Characterise the extent of contamination on-site and assess contaminant mobility based on soil pH and TCLP results.
- Provide recommendations for the conduct of a health and/or ecological risk assessment.

To achieve these objectives, the assessment included the following activities:

- Review of previous consultants' investigation reports.
- Conduct a hazardous materials audit to identify the extent of lead based paint, asbestos and PCBs.
- Conduct a soil and surface water investigation.
- Preparation of a Site Investigation Report.

This report presents the results of the investigation and contains recommendations applicable for the re-development of the site. Site audit and investigation works were carried out during the period 28 July to 1 August 1997.

2. Background Information

2.1 Overview of Previous Consultants' Reports

New Farm Power Station and the adjacent Queensland Electricity Commission (QEC) site have been the subject of two previous site investigations:

- Stage 1 - Preliminary Site Investigation New Farm Powerhouse, Brisbane City Council Analytical Services
- Preliminary Site Assessment on QTSC Site - New Farm, Woodward-Clyde.

The Stage 1 Site Investigation by Brisbane City Council indicated the following:

- Sample locations were predominantly confined to the area of fill on the eastern side of the site with further sampling occurring in the boilerhouse rubble, and various surface locations.
- Soil samples (obtained from boreholes 3, 6, and 10 in the area of the fill) analysed contained selected heavy metal concentrations greater than Department of Environment (DoE) guidelines.
- Organic compound results greater than DoE levels were obtained in three samples (boreholes 1, 3 and 5) and asbestos was detected in borehole 3.
- This report concluded that "there was no evidence of any significant levels of contamination which would restrict the development of the site for the end uses proposed".

Woodward Clyde conducted a preliminary site assessment for the adjacent QTSC/QEC site and the results from this indicated that:

- Surface samples (obtained from TP1, TP2 and FP3) contained selected heavy metal concentrations greater than DoE threshold values.
- Samples at depth were not analysed. Fill including ash, gravel and general rubbish was encountered in two of the three test pits.

2.2 Property/Address

The site address is New Farm Powerhouse, Lamington Road, New Farm. A site location map for the site is presented in Appendix A.

2.3 Party Responsible for Assessment

Brisbane City Council
69 Ann Street
BRISBANE QLD 4000

2.4 Environmental Consultant

PPK Environment and Infrastructure Pty Ltd
IBM Centre
348 Edward Street
BRISBANE QLD 4000

2.5 Proposed Land Use

The New Farm Power Station site has been decommissioned and is being considered for re-development for public use.

2.6 Operator of Site

The registered owner of the site is Brisbane City Council.

RTI DL RELEASE - EHP

3. Site Description and Inspection

3.1 Topography

The site occupies a near rectangular parcel of land approximately 95 metres by 110 metres in dimension.

The site consists of three terraces (north western, middle and south eastern). The south eastern and the north western terraces are essentially flat whilst the middle terrace is elevated and slopes at approximately 3-5° to the north west and approximately 5-8° towards the south east.

A site layout is presented in Appendix B.

3.2 Surrounding Land Use

The New Farm Power Station is situated at the end of Lamington Road, in an area used extensively for light industrial activity and public open space.

Queensland Electricity Corporation (QEC) operates several workshops on the north western boundary of the site and a Commonwealth Sugar Refineries (CSR) gypsum bulk handling depot is located approximately 200 metres north of the site. To the south west and north east the site is bordered by New Farm Park and Power House Park, respectively. The Brisbane River represents the southern boundary of the site.

3.3 Local/Regional Geology

Geological survey maps indicate that soils in the area are Quaternary aged undifferentiated alluvial plains consisting of sand, silt clay and gravel. The alluvial sediments overlie a sequence of primarily Triassic aged volcanic rocks including ignimbrite, stratified and massive rhyolitic tuff, and conglomerate, sandstone and scree breccia horizons. The volcanic rock sequence is underlain by cleaved shale, siltstone and greywacke of the Neranleigh - Fernvale Beds formation (Brisbane Sheet 9543 1:100 000 Geological Map; Department of Mines 1986).

3.4 Groundwater

The close proximity of the Brisbane River suggests that groundwater will be encountered at approximately 2 - 3 metres depth below ground level. The shallow depth was later confirmed during site works.

3.5 Site Observations

At the time of the site works the site was secured by a chain link fence around the perimeter. Several holes in the fence were evident allowing access to the power station grounds and building. Approximately 70% of the site is paved or constructed upon with unpaved areas being present on top of the boilerhouse, the western and southern sides of the power house structure and the eastern area of fill. The condition of the concrete in the area of the railway line and in front of the boilerhouse was satisfactory. Unpaved areas were well grassed and the vegetation did not exhibit signs of die back. Broken asbestos cement sheeting was scattered at various points outside the building structure.

The demolished boilerhouse area has been filled, with building rubble, vegetation and topsoil, being visible through gaps in retaining plate steel sheets located adjacent to the railway line. The ground surface of the boilerhouse is uneven and piles of building debris and removed vegetation were located in this area.

The interior of the power station building was in a state of disrepair with building debris located at various points. The majority of machinery and infrastructure had been previously removed with the exception of the gantry crane, switches and transformer remaining. Previous asbestos removal work is evident on the northern side of the first, ground and lower ground floors. Damaged asbestos materials are scattered throughout the power house and very few undamaged asbestos materials remain.

Oils from the switch room located on the first floor had leaked from the switches through floor penetrations resulting in pooling on the lower floor. Several areas of standing water and drain sediments were also noted at this time. Paint in the interior of the building was encountered in various states of repair and many of the wall surfaces exhibited graffiti.

There is evidence to suggest that the site has been utilised as an illegal party venue and used syringes were noted at various locations around the site. Broken bottles and other rubbish were also noted during site investigation works.

4. Summary of Potential Contamination Issues

Based on the previous use of the site as a power station, an initial site visit, and Brisbane City Council anecdotal information, the following contaminants may be present:

- Asbestos - from wall and roof sheeting, pipe lagging, fireproofing and electrical insulation.
- PCBs - from fluorescent light capacitors and leaking switch room and transformer oils.
- Lead - from lead-based paint.
- Poly aromatic hydrocarbons (PAHs) - produced as a by product of the combustion process contained in areas of ash fill.
- Metals - from boiler ash waste.
- Organo chlorine pesticides (OCPs) - from weed control around the railway line.
- Petroleum hydrocarbons - from the spillage of waste oil and or diesel from machinery operation and the railway line.

5. Hazardous Materials Sampling Program

5.1 Sampling Methodology and Locations

Sampling locations for asbestos, lead-based paint and PCBs are presented in Appendix C.

Samples of suspected asbestos materials were collected from representative locations throughout the power station and surrounding grounds. The samples were collected by removing a small portion of the suspect material using clean tools and equipment, placing the sample into a clean plastic clip lock bag and assigning a unique identification number. This number was recorded in the field sampling record together with details describing the location, product type, size, and condition of the material.

Photographs of the asbestos sample in-situ were taken at each sampling location and relevant sample details were recorded. These included:

- size
- condition
- product type
- application

Lead-based paint samples were collected by carefully scraping paint samples from selected locations within the power station building. These scrapings were then placed into clean plastic clip lock bags and submitted for laboratory analysis.

Suspected PCB material was collected in clean, acid washed, solvent rinsed, sample jars supplied by the analytical laboratory. Oil from switch gear and transformers within the power house structure were targeted for PCB analysis. Photographs are supplied in Appendix D.

5.2 Handling of Samples

PCB samples were placed into an esky chilled to approximately 4°C by frozen ice bricks. Each sample was assigned a unique sampling number and details placed on the field sampling record.

Upon completion of field activities, all samples were checked for labelling consistency and reconciled to the field sampling record. Chain of Custody and laboratory analysis requests were completed for each sample batch. The asbestos, lead based paint and PCB samples were submitted to a NATA accredited laboratory within 24 hours of collection.

5.3 Laboratories Used

Asbestos

PPK Asbestos Laboratory
348 Edward Street
Brisbane QLD 4000

Lead Based Paint and PCBs

Amdel Ltd
5 Kelray Place
Asquith NSW 2077

5.4 Assessment Criteria

To determine the significance of any contamination detected it is necessary to define applicable concentrations that are to be used for comparison.

Asbestos

Exposure limits for airborne concentration of asbestos have been formulated by Worksafe Australia and are as follows:

- Chrysotile (White asbestos): 1.0 fibres/ml
- Amosite (Brown/Grey asbestos): 0.1 fibres/ml
- Crocidolite (Blue asbestos): 0.1 fibres/ml
- Other Forms of asbestos: 0.1 fibres/ml

For the purpose of this assessment a worst case scenario has been presumed and consequently the limit of 0.1 fibres/ml has been adopted. Presently, there are no guidelines or concentrations for asbestos fibres in soil.

Lead Based Paint

There is on going regulatory discussion about the concentration limit for lead in paint with values ranging from 0.25 % and 1.0 %. For the purpose of this investigation the level of 0.25 % formulated by the National Health and Medical Research Council (NH&MRC) for new paint has been adopted.

PCBs

PCBs are persistent in the environment and have a DoE threshold level of 1 mg/kg in soil. Currently there are no health based guidelines utilised by the DoE for the assessment of PCBs. PCBs have been classified as a Class 1a carcinogen by the Western Australian Health Department and a limit of 50 ppm has been adopted for PCBs in capacitors.

5.5 Results

The hazardous materials audit yielded the following results. Full laboratory analytical results for asbestos, lead-based paint and PCBs are supplied in Appendix E.

Asbestos

Two forms of asbestos products were identified during site inspection work: bonded asbestos and friable asbestos. Bonded asbestos-containing materials identified include:

- fibre cement sheeting
- resinous mounting boards
- fibre cement pipework

The fibre cement sheeting identified is generally in poor condition, badly damaged and scattered over the entire site. This material contains a mixture of all three asbestos types and appears to have originated from internal wall linings, ceiling linings, external eaves linings, and gable ends.

Resinous mounting boards containing chrysotile asbestos are located mainly in the switch room on the south side of the power station and are generally in fair condition.

A small section of fibre cement pipework is located in the service tunnel at the far western end of the ground floor. This material is unsealed and generally in good condition.

The bonded materials pose a low risk to health as asbestos fibres are bound into the firm matrix material. Of greater concern to health is the friable asbestos located at various points throughout the site.

Friable asbestos-containing materials identified during the site inspection include:

- lagging debris
- millboard
- woven textile

Asbestos lagging is located in minor quantities at various points throughout the first, ground and lower ground floors and contains a mixture of chrysotile and crocidolite asbestos. It is understood this material originates from removed steam pipes and boilers.

Asbestos millboard material containing chrysotile asbestos is located in switch room fuse covers and is present as thermal lining inside the electrical cabinet door on the east wall of the ground floor. Additional asbestos millboard in the form of castings are present in the switch rooms and appear to originate from within the switch gear. The millboard material is in a generally poor condition and scattered over the floor surface.

The woven textile material located mainly in the switch rooms or south side of the ground floor contains chrysotile asbestos. The woven nature of this material is less likely to release significant airborne fibre concentrations. In some instances this material is partially sealed with paint providing an encapsulant over the asbestos, thus further inhibiting fibre release.

The asbestos lagging and millboard materials are friable and unstable in their present condition and may release significant levels of airborne fibre (>0.05 fibres/ml) if disturbed. Due to the friable nature of the woven asbestos textile material and its location on floor surfaces, it is considered a moderate risk to health.

The extent of the asbestos is not fully known on the lower ground floor as it is currently submerged in approximately 300 mm of water. Friable asbestos-containing material was detected at the northern edges of the lower ground floor area and it must be presumed that further asbestos contamination may exist below the water surface.

Sampling for airborne fibres within the power station revealed that airborne fibre concentrations were well below the occupational exposure standard of 0.1 fibres per millilitre and were not approaching the action level of 0.05 fibres per millilitre.

Two soil samples were collected from test pits excavated in the building rubble of the demolished boilerhouse and analysed for asbestos. One soil sample (TP10; 2.2-2.4m) contained chrysotile asbestos in cement sheeting.

A summary of identified asbestos situations is contained in Table 1 and a full asbestos register is presented in Appendix F.

Table 1 - Identified Asbestos Situations

Lower Ground Floor

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Fill material at the side of lower floor area on southern side	Debris	Insulation material	Poor	Yes	Immediate	Unknown	CH	Refer 20	-	Significant quantities of asbestos debris are present in the soil on northern edge next to steps. This material may be scattered throughout the lower ground floor area, which is presently submerged in 300mm water.

CH - Chrysotile Asbestos

A - Amosite Asbestos

C - Crocidolite Asbestos

NAD - No Asbestos Detected

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Table 1 Continued... Ground Floor

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Third column from west end	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH	Refer 20	22/1	
Back of third column from west end	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH	20	23/1	Debris at base of column is visually consistent with debris on column. Some material evident around base of several other columns.
Throughout ground floor	Debris	Fibre cement sheeting	Poor	No	Medium	<1m ²	CH,A,C	Refer 7	-	Scattered over floor surface
On top of concrete plinth on northern wall	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH	Refer 20	-	
Electrical Cabinet, eastern wall	Arc shields	Fibre cement sheeting	Fair	No	Medium	<1m ²	CH	21	24/1	Four Arc shields
Electrical Cabinet, eastern wall	Electrical mounting board	Resinous board	Fair	No	Medium	<1m ²	CH	22	24/1	
Electrical Cabinet, eastern wall	Insulation to cabinet door	Millboard	Poor	Yes	High	1m ²	CH	23	24/1	Internal thermal lining to cabinet door
1st small room, south-east corner	Debris	Fibre cement sheeting	Poor	No	Medium	2m ²	CH,A,C	Refer 7	-	Broken fibre cement sheeting and resinous membrane scattered over floor surface
1st small room, southern wall	Gasket	Gasket	Fair	No	Medium	1m ²	CH	24	1/2	These and other gaskets are scattered throughout ground floor area.
South wall	Fuse insulation	Textile	Poor	Yes	High	10m ²	CH	26	3/2	Widespread throughout area
Tunnel - west wall	Gutter Down pipe	Compressed sheet	Fair	No	Medium	2 linear meters	CH	27	4/2	Unsealed

CH - Chrysotile Asbestos
 A - Amosite Asbestos
 C - Crocidolite Asbestos
 NAD - No Asbestos Detected

Table 1 Continued... First Floor (Level 1)

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Elevated Floor Slab on south side	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH,C	13	12/1	
Throughout first floor	Debris	Fibre cement sheet	Poor	No	Medium	40m ²	CH,A,C,	Refer 7	16/1	Damaged fibre cement sheeting scattered over entire floor surface
Recess in north wall	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH,C	Refer 13	17/1	
Hole at base of north wall near elevated platform	Debris	Insulation material	poor	Yes	Immediate	<1m ²	CH,C	Refer 13	18/1	
Switch Room, south west corner	Insulation to fuse socket	Textile	Fair	Yes	High	2m ²	CH	17	19/1	
Switch Room, south west corner	Insulation to fuse hood	Millboard	Fair	Yes	High	2m ²	CH	18	20/1	
Switch Room, south west corner	Debris	Millboard	Poor	Yes	Immediate	2m ²	CH	Refer 17 and 18	21/1	Asbestos millboard castings are scattered over entire floor. Similar situations are present in either switch rooms.
LT Board Room, south west corner on floor	Debris	Textile	Poor	Yes	High	1m ²	CH	Refer 17	-	Asbestos textile debris is scattered over floor surface
Electrical Cabinet, south wall of Turbine Room	Arc Shields	Fibre cement sheeting	Fair	No	Medium	1m ²	CH	Refer 21	-	Arc shields are unsealed

CH - Chrysotile Asbestos

A - Amosite Asbestos

C - Crocidolite Asbestos

NAD - No Asbestos Detected

Table 1 Continued... First Floor (Level 1) Mezzanine

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Mezzanine Floor surface	Debris	Fibre cement sheeting	Poor	No	Medium	1m ²	CH	Refer 28	-	Broken fibre cement sheeting scattered on floor originates from leaves lining
South side of Mezzanine	Insulation to electrical mounting board	Millboard	Poor	Yes	High	< 1m ²	CH	15	15/1	Thermal lining inside electrical box

Second Floor (Level 2)

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Floor Partition Walls	Wall lining	Fibre cement sheeting	Poor	No	Medium	30m ²	CH	12	10/1	Badly damaged fibre cement sheeting, debris scattered over floor surface

Second Floor (Level 2) Mezzanine

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Throughout Mezzanine	Ceiling lining	Fibre cement sheeting	Poor	No	Medium	240 m ²	CH,A,C	7	-	Several sheets smashed and badly damaged
Switch Room	Lower wall lining	Fibre cement sheeting	Fair	No	Medium	40 m ²	CH	8	6/1	
Switch Room	Electrical mounting board	Resinous board	Fair	No	Medium	2 m ²	CH	11	9/1	Dark coloured mounting boards
Throughout Mezzanine	Debris	Fibre cement sheeting	poor	No	Medium	10 m ²	CH,A,C	Refer 7	-	Broken AC debris scattered over floor surface

CH - Chrysotile Asbestos

A - Amosite Asbestos

C - Crocidolite Asbestos

NAD - No Asbestos Detected

Lead Based Paint

Structures painted with lead-based paint have deteriorated considerably over the years. Much of the paint has peeled away from the substrate and has fallen on lower surfaces. Elevated lead concentrations in excess of the occupational exposure guidelines of 0.25 % were detected in six of the seven samples submitted for laboratory analysis. A maximum lead content of 46 % was detected sample P3, corresponding to a light blue/grey paint on structural steel RSJ beams.

A summary of elevated lead results is presented in Table 2.

Table 2 - Elevated Lead in Paint Concentrations

Sample No	Sample Description	Lead Content (% W/W)
P1	Blue coloured paint with white undercoat on internal walls, level 2 mezzanine	13
P2	Light blue paint on switchboard units, level 2 mezzanine	0.940
P3	Light blue/grey paint on structural steel RSJ beams, level 2	46
P4	Brown/yellow paint on lower walls, level 1	18
P6	Silver coloured paint on structural steel columns throughout power station	19
P7	White paint on upper walls throughout ground floor and level 1	11

PCBs

Analysis of suspected PCB containing materials revealed that PCBs were not present. A sample of the electrical capacitors in the fluorescent light fittings was not obtained for safety reasons, however, these capacitors are suspected to contain PCBs due to their age.

5.6 Risk Appraisal

Asbestos

At present, the asbestos materials located at the New Farm Power Station do not pose an immediate risk to health. This assessment is based on the results of airborne fibre monitoring conducted at various representative locations on site which reveal no elevated airborne fibre levels (>0.1 fibres/ml) on site.

Lead Based Paint

The extent and poor condition of lead-based paints throughout the New Farm Power Station presents a health hazard to persons entering the site as it may easily become airborne and possibly inhaled or swallowed.

PCBs

PCBs were not detected in the samples analysed, however, it is presumed that fluorescent light capacitors contain PCB material. Suspected PCB-containing capacitors are not likely to present a risk to personnel on site providing they remain undisturbed.

RTI DL RELEASE - EHP

6. Soil and Water Sampling Program

6.1 Soil Sampling Methodology and Locations

Soil sampling locations are supplied as Appendix G.

The soil sampling program was conducted during the period from 31 July to 1 August and consisted of:

- The excavation of test pits on a 40 metre grid pattern around the perimeter of the building and the excavation of two pits in the demolished boilerhouse. Samples from the test pits (TPs 1 - 10), were taken at 0.5 metres intervals or change of strata (whichever was the greater) up to a maximum depth of 4.3 m.
- Three sediment samples (Coal Drain, Turb 1 East and Turb 2 West) obtained from sealed drains located within the powerhouse building.

Excavation was undertaken using a backhoe and the bucket was pressure cleaned between test pits to minimise the risk of cross contamination.

A stainless steel trowel was used to collect soil samples from the bucket or excavation wall and the trowel was washed between samples to reduce the risk of cross contamination.

6.2 Water Sampling Methodology and Locations

Areas of free standing water were identified during a preliminary site walkover in the following locations:

- The sump located beneath the switch rooms.
- Coal bunkers in the turbine room.
- Turbine room depressions.

Water samples from the sump were collected using a disposable bailer with the sample being transferred to sample bottles. The coal bunker and turbine room depressions were sampled by immersing the clean sample jars into the water and drawing the sample.

All sample jars and bottles were supplied by the laboratory performing the analysis.

6.5 Sampling Depths and Analytes

Individual soil samples were collected at 0.5 metre intervals or change of strata whichever was the greater. All soil samples were submitted to the laboratory for the following analysis:

- Total Petroleum Hydrocarbons (TPH) in the C₆-C₃₆ chain length range
- Poly-aromatic Hydrocarbons (PAH)
- Heavy Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn)
- pH

In addition, the following analyses were undertaken

- 1 sample from each test pit was submitted for analysis of sulphur
- 3 samples submitted for analysis of OCPs and organo-phosphorous pesticides (OPPs)
- 4 samples submitted for analysis of cyanide
- 2 samples submitted for toxicity characteristic leaching procedure (TCLP) analysis of selected heavy metals.

All water samples were submitted for the following analysis:

- TPH
- Heavy Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn)

In addition, the sump sample was submitted for analysis of PCBs.

The above described analytes were chosen on the basis of previous site activities and possible contaminants commonly associated with power station sites.

6.6 Laboratories Used

Soil and Water

Amdel
5 Kelray Place
Asquith NSW 2077

6.7 Assessment Criteria

Assessment criteria are utilised to determine the significance of contamination detected during the sampling program and determine appropriate removal/disposal techniques. For this investigation and the determining of appropriate disposal strategies the following assessment criteria were consulted:

- Soil assessment criteria:

- ▶ DoE threshold levels.
- ▶ Dutch Intervention levels consulted in the absence of applicable DoE levels.
- ▶ Brisbane City Council Disposal criteria for lined and unlined landfills.
- Water Assessment criteria:
 - ▶ ANZECC Guidelines for raw water.
 - ▶ Brisbane City Council Trade Waste Discharge Limits.

6.8 Results

Laboratory analytical results and returned Chain of Custody forms are supplied as Appendix I and J respectively. A summary of the analytical results with statistical analysis is supplied as Appendix K.

6.9 Analytical Results - Soil

With respect to the site conditions and regulatory requirements, the results of the soil investigation are :

- Arsenic levels, above the DoE guideline of 20 mg/kg were detected in 2 of 23 samples analysed. These elevated results were detected in TP2 (fill material in a backfilled depression adjacent to the boilerhouse) and Turb 1 East (sediment in an open concrete drain in the turbine room).
- Levels of cadmium above DoE guidelines were encountered in 3 samples analysed. These samples were Coal Drain (sediment in sealed concrete drain in the coal handling area) Turb 1 East and Turb 2 West (sediment in an open concrete drain in the turbine room). A maximum concentration of 52 mg/kg was detected in sample Turb 1 East.
- Soil sample Turb 1 east reported elevated chromium, copper, nickel and mercury levels in excess of DoE guidelines of 57 mg/kg, 1140 mg/kg, 60mg/kg and 291 mg/kg respectively.
- Copper concentrations in excess of DoE guidelines were detected in a further 5 samples. These were:
 - ▶ Coal Drain;
 - ▶ Turb 2 West;
 - ▶ Two samples from TP 8 (fill material located on the south eastern boundary of the site adjacent to the Brisbane River); and
 - ▶ TP 2.

- Mercury concentrations in excess of DoE guidelines were detected in 3 further samples. These were:
 - TP 2;
 - Coal Drain; and
 - Turb 2 West.
- Lead and zinc concentrations exceeding the DoE guidelines were detected in samples obtained from TP 2, TP 8, Coal Drain, Turb 1 East and Turb 2 West. A sample from TP 4 (western side of site adjacent to New Farm Park), taken from approximately 2.8 m BGL, contained zinc in concentrations exceeding DoE guidelines.
- Levels of PAHs in excess of DoE guidelines were detected in two samples TP 4 and TP 7 (located on western end of southern boundary adjacent to Brisbane River) with a maximum total PAH concentration of 355 mg/kg being present in the sample from TP4.
- TCLP analysis of samples from TP2 and Turb 1 East indicated lead and zinc levels in leachate greater than acceptance criteria for unlined landfills, however, the leachability of contaminants within the material is within disposal criteria for a lined landfill.

All other parameters analysed were below the relevant DoE or Dutch Intervention guidelines.

Table 3 provides a summary of soil sample results above the regulatory thresholds.

Table 3 - Elevated Soil Contaminant Levels

Sample #	As	Cd	Cr	Cu	Ni	Pb	Zn	Hg	Total PAH
TP2 0.3-0.5	124	1	14	131	42	818	1840	3.9	-
TP4 2.8-2.9	-	1	21	20	17	57	880	0.12	355
TP7 1.9-2.0	-	-	9	59	11	105	131	0.48	87
TP8 1.2-1.3	-	-	8	72	12	177	131	0.33	-
TP8 1.9-2.0	9	-	8	110	15	2340	376	0.12	8.7
Coal Drain	7	52	16	282	13	5140	3360	2.1	-
Turbine 1 East	30	11	57	1140	88	23 700	23 600	291	-
Turbine 2 West	17	8	48	528	52	24 600	28 300	27	-
DoE Guideline	20	3	50	60	60	300	200	1	20
Dutch Intervention	55	12	380	190	210	530	720	10	40

Notes: All values in mg/kg unless otherwise specified
 Values in bold indicate levels exceeding DoE guideline
 - Indicates level lower than laboratory analysis limits of detection

6.10 Analytical Results - Water

Water sampling and laboratory analysis of samples obtained from the three identified areas of standing water produced the following results:

- Levels of TPH exceeding the Brisbane City Council Trade Waste Discharge Limits were detected in water samples collected from the turbine room, coal bunker and sump. A maximum total TPH concentration of 3040 mg/L was detected in the sump sample.
- Lead levels exceeding the ANZECC Raw Water guidelines were detected in the Turbine room and Bunker samples.
- A mercury level above the ANZECC Raw Water guideline of 0.013 mg/L was encountered in the Bunker sample.

Table 4 provides a summary of the elevated water results exceeding current regulatory criteria.

Table 4 - Elevated Water Contaminant Levels

Sample #	TPH C ₉	C ₆ - C ₁₄	TPH C ₁₀ - C ₂₈	TPH C ₁₅ - C ₃₆	TPH C ₂₉ - C ₃₆	Pb	Hg
Turbine Room	-	100	36 000	-	-	102	-
Sump	-	2200	3 000 000	34 000	-	-	-
Bunker	-	260	6400	1000	-	1200	13
Brisbane City Council Trade Waste Discharge Limit	30 000					10 000	50
ANZECC Guideline	-					0.05	0.001

All values in µg/L unless otherwise specified

7. Health and Safety Issues During Removal and Disposal of Hazardous Materials

Asbestos

Toxicity:	Class 1a Carcinogen.
Exposure Pathway:	Inhalation.
Personal Protective Equipment:	Class P2 respirator, disposable overalls.

Mesothelioma may be contracted without high level chronic exposure to asbestos dust. This is the most likely asbestos related disease that may be contracted if asbestos exposure occurs at this site.

There are several methods available for the control of asbestos including:

- Deferment
- Encapsulation/sealing
- Enclosure/isolation
- Removal

Personnel involved in the removal or disposal of asbestos from this site should wear a class P2 respirator, and disposable overalls as a minimum. The respirator may be either a canister or disposable type and proper fitment must be ensured to maintain protection.

Overalls and disposable respirators should be placed into a clean plastic bag, clearly labelled with asbestos warning signs when leaving the contaminated area and then sealed and placed into a second clean plastic bag with the same markings and sealed again.

Lead Based Paint

Toxicity:	Known intellectual impairment in children, suspected teratogenic substance.
Exposure Pathway:	Inhalation, ingestion, dermal contact.
Personal Protective Equipment:	Class P2 respirator, disposable overalls, rubber gloves, safety glasses.

Relatively low levels of lead in the blood can adversely affect the intellectual development and behaviour of young children. Excessive exposure may result in a range of neurological effects in adults. Lead is also foeto-toxic and may cross from the mother to the baby through the placenta to affect the nervous system of the child and may also result in premature birth.

The removal of lead-based paint should be performed with all efforts being made to reduce the production of airborne dust or fumes. To this end, wet sanding or chemical paint stripping are the most effective forms of removal. Lead paint abatement should be carried out in accordance with the Draft Australian Standard 97003 which provides a guide for the management of lead paint in residential and commercial buildings.

Half face respirators meeting the requirements of Australian Standards AS1715 and AS1716 should be worn in addition to goggles or face shields to prevent eye irritation or injury. Coveralls, disposable overshoes, gloves and a hat are also recommended. Should skin contact be made with the lead-based paint (particularly hands), a Tri-sodium phosphate/water solution should be used to decontaminate the skin surface.

PCBs

Toxicity:	Class 1a Carcinogen.
Exposure Pathway:	Ingestion, dermal contact.
Personal Protective Equipment:	Disposable overalls, rubber gloves, safety glasses.

PCB exposure may immediately result in irritation to the eyes and long term health problems with skin, hair and the liver. PCBs are classed as a Class 1a carcinogen by the West Australian Department of Health.

Removal of the suspected PCB containing capacitors in the fluorescent light fittings should be undertaken with care to ensure that dermal contact or ingestion of the material does not occur. Personal protective equipment to be used in this instance includes, rubber nitrile gloves, disposable overalls, safety glasses and substantial footwear.

8. Conclusions and Recommendations

PPK conducted a hazardous materials audit and a contaminated site investigation of the New Farm Power Station, Lamington Road, New Farm. From these works and the subsequent laboratory analysis of samples the following conclusions may be drawn:

- Asbestos is present over much of the site, both internally and externally. It is present in two forms, friable and bonded asbestos material with the friable material presenting a high risk to health due to its structure and condition.
- Lead-based paint is present on site with the lead content in 6 of 7 samples submitted for laboratory analysis exceeding NH&MRC limits. Condition of the lead paint may be considered poor presenting a high risk to users of the site and construction workers involved in redevelopment.
- PCBs were not detected in the oil or water samples analysed. PCB capacitors are likely to be on site in fluorescent light fittings due to the age of such fixtures.
- Site investigation works indicated that 8 of 23 soil samples submitted for laboratory analysis reported selected heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb and or Zn) and/or PAHs in levels greater than accepted DoE or Dutch Intervention guidelines. The horizontal and vertical extent of contamination has not been fully delineated.
- Areas exhibiting the greatest impact on-site include:
 - ▶ Sediments that have accumulated within drains inside the turbine room and coal handling area;
 - ▶ The area of fill along the southern boundary of the site;
 - ▶ Fill located along the western boundary adjacent to New Farm Park; and
 - ▶ Fill located in a depression adjacent to the boilerhouse (TP2).
- Three water samples obtained from the turbine room, coal bunker and sump (inside the powerhouse building) contained TPH, Pb and/or Hg at levels in excess of ANZECC and/or Trade Waste Discharge Limits for Brisbane City Council.
- TCLP analysis of samples Turb 1 East and TP2; 0.3-0.5 indicated lead and zinc levels in leachate exceeded the acceptance criteria for unlined landfills but were within acceptance limits for lined landfills.

From these conclusions and with the understanding the site is to be utilised for public use, the following recommendations may be made:

- Prior to demolition or removal works, a comprehensive workplace health and safety plan be developed.
- Friable asbestos material be removed from site by a licensed asbestos removalist and disposed of at an approved landfill, in accordance with all statutory and legislative requirements.

- Airborne fibre monitoring during and after removal of asbestos material and final visual inspection to be conducted by suitably qualified occupational hygienist.
- Consideration for the removal of bonded asbestos materials should include time frame, removal options, qualified removal personnel and disposal options.
- Further air sampling of the indoor air environment to determine airborne lead paint concentrations.
- Interim measures for mitigating the exposure to lead particulates such as encapsulating the material with a spray mist form encapsulant should be considered.
- Final removal of lead based paint is required to be undertaken by a suitably qualified contractor. The draft Australian Standard DR97003 should be used as a guide for this work.
- Suspected PCB capacitors should be removed from light fittings and disposed of in accordance with all relevant statutory requirements.
- A health risk assessment be conducted for selected parameters and pathways to assist in the development of appropriate remedial strategies for impacted soil material. Remedial strategies may include capping and/or limited excavation and disposal.
- Further investigation to delineate the extent of contamination in areas which may require remedial works (eg TP2).
- Assessment of groundwater conditions and potential impacts to nearby aquatic eco-systems.
- The removal and off site disposal of accumulated drain sediments to a licensed lined landfill in accordance with all statutory requirements. A Section 14 Approval for the Transport and Disposal of Contaminated Material is required for this work.
- Subject to the development of the preferred remedial strategy, fill material adjacent to the boilerhouse (ie TP 2 samples), may require partial or total excavation and off site disposal to an approved facility.
- Contaminated surface waters to be collected by a suitably licensed liquid waste disposal contractor, treated and disposed of at a licensed treatment facility. Alternatively, on site treatment of the water to a level meeting Trade Waste Discharge Limits may be undertaken prior to discharge to sewer.

On the basis of these recommendations further investigations and/or remedial works would be required at the site prior to redeveloping the power station as a recreational facility.

9. Statement of Limitations

This assessment was restricted to the agreed-upon Scope of Services. No representations or warranties are made concerning the nature or quality of the soil and water, or any other substance on the Property, other than the visual observations and analytical data as stated in this report.

On all sites, varying degrees of non-uniformity of the vertical and horizontal soil or groundwater conditions are encountered. Hence no sampling technique can completely eliminate the possibility that samples are not totally representative of soil and/or groundwater conditions encountered. The sampling can only reduce this possibility to an acceptable level.

It should also be recognised that site conditions, including contaminant extent and concentrations can change with time. This is particularly relevant if this report is used after a protracted delay, such that further investigation of the site may be necessary.

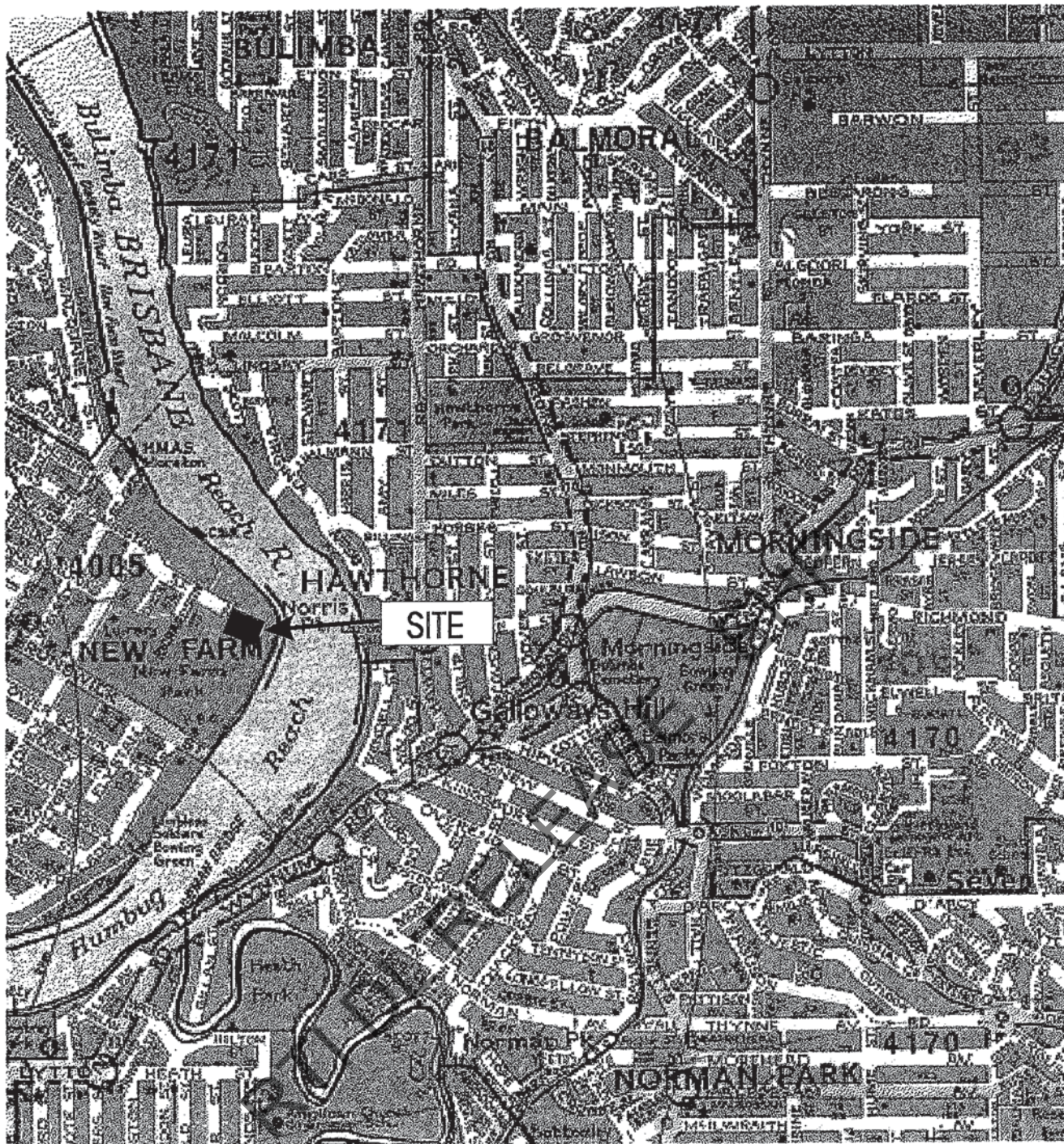
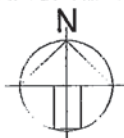
In preparing this report, PPK has relied upon certain verbal information and documentation provided by the client and/or third parties. Except as discussed, PPK did not attempt to independently verify the accuracy or completeness of that information, but did not detect any inconsistency or omission of a nature that might call into question the validity of any of it. To the extent that the conclusions in this report are based in whole or in part on such information, they are contingent on its validity. PPK assume no responsibility for any consequences arising from any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to PPK.

Within the limitations of the agreed-upon Scope of Services, this assessment has been undertaken and performed in a professional manner, in accordance with generally accepted practices, using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, express or implied, is made.

This report is based upon the Scope of Services, and is subject to the Limitations and Restrictions, defined herein. It has been prepared for the exclusive use of Brisbane City Council. No other person or organisation is entitled to rely upon any part of it without the prior written consent of PPK. Brisbane City Council may release all or part(s) of this report to third parties; however, such third party in using or relying on this report agrees that it shall have no legal recourse against PPK or their parent or subsidiaries, and shall indemnify and defend them from and against all claims arising out of, or in conjunction with, such use or reliance.

Appendix A

Site Location Map



PPK
Environment & Infrastructure

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TITLE:

**NEW FARM POWER STATION
LAMINGTON ROAD**

SITE LOCATION

SCALE:

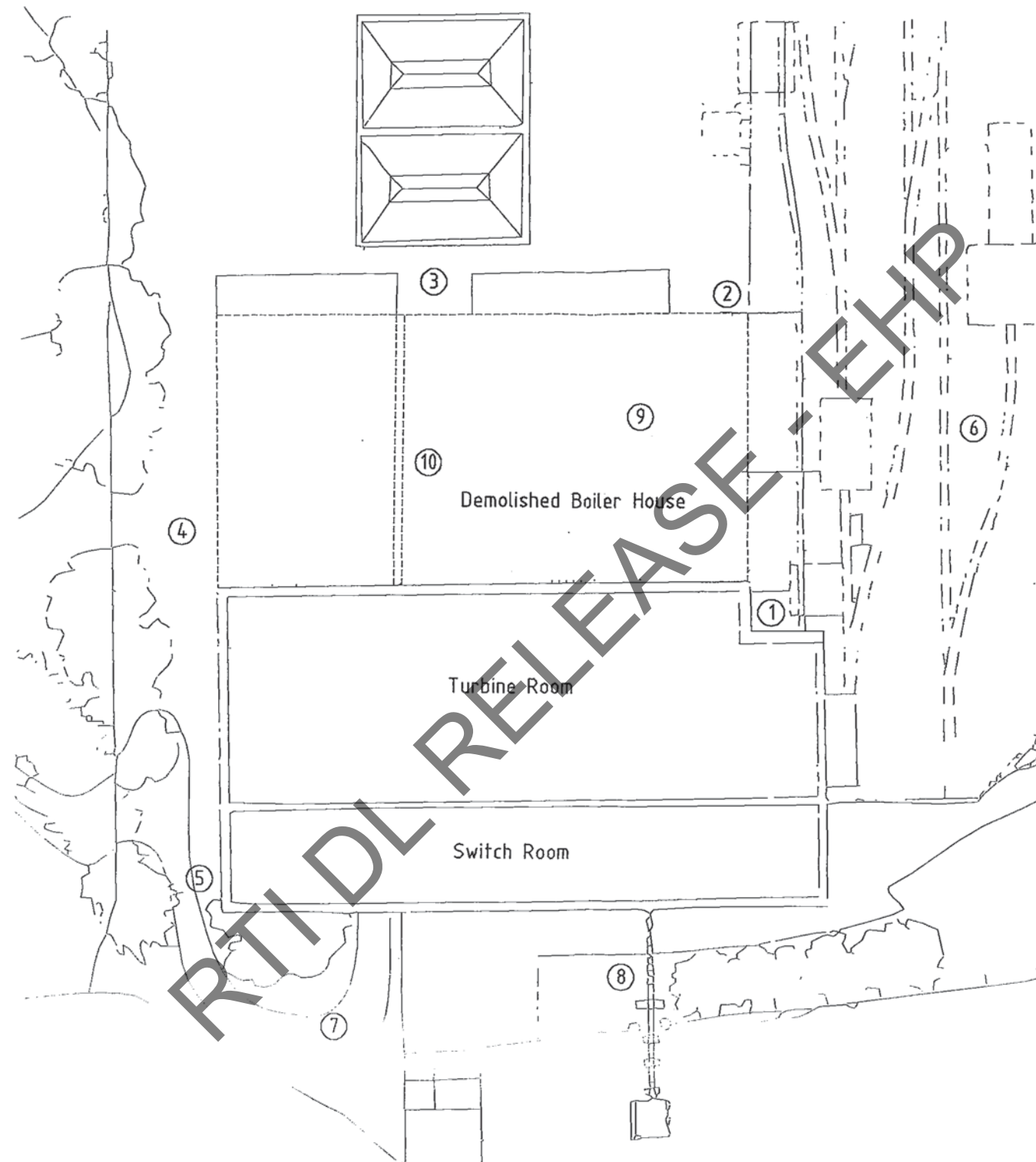
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Appendix B

Site Layout

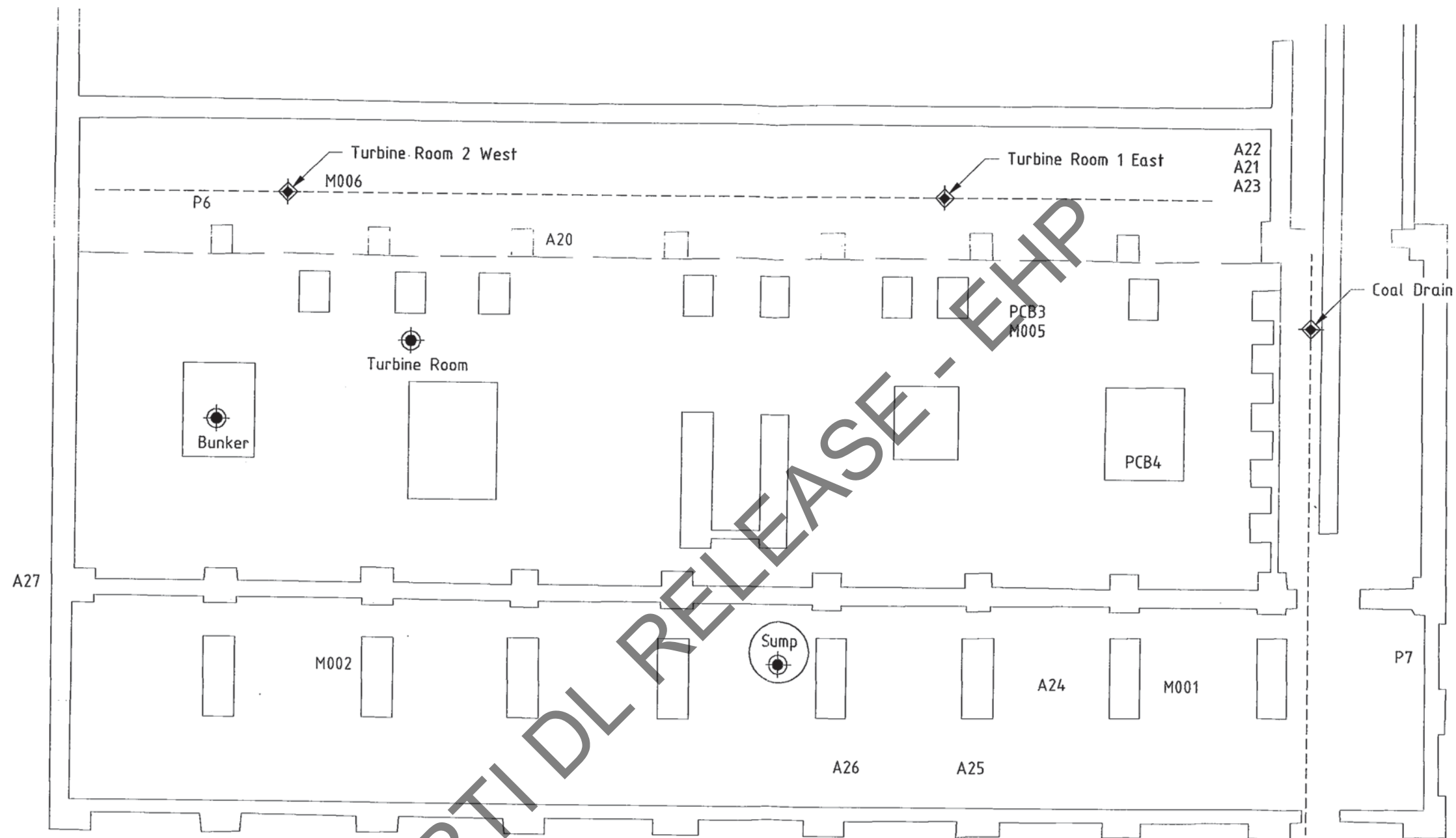
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LEGEND

⑤ TEST PITS

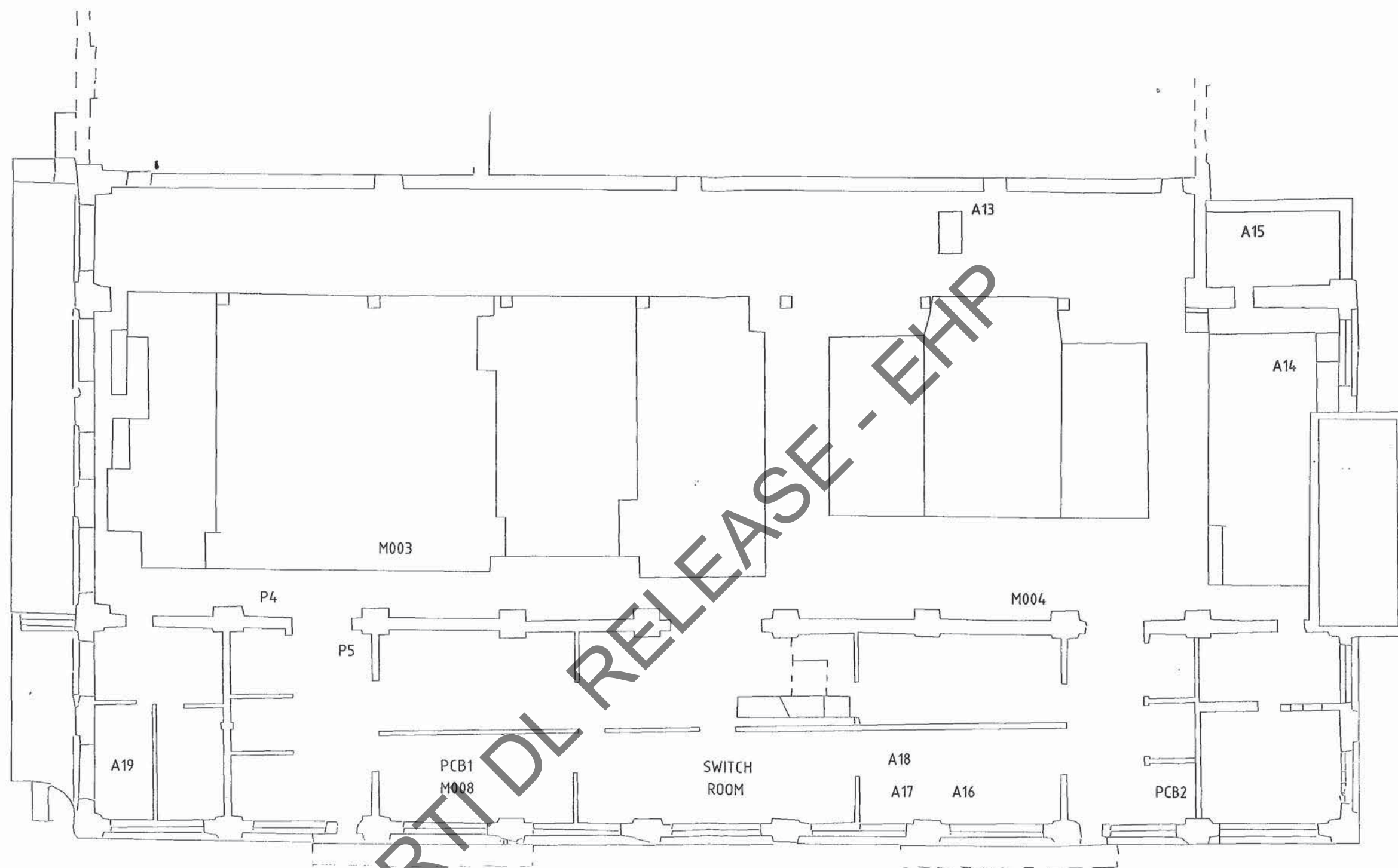
RTI DL RELEASE EHP		PPK Environment & Infrastructure 12th Floor IBM Centre 348 Edward Street Brisbane QLD 4000 G.P.O. Box 2907 Brisbane QLD. 4000 Australia Tel. 07 3218 2222 Fax 07 3831 4223 Email ppkbris@ozemail.com.au		NEWFARM POWERSTATION ESA BRISBANE CITY COUNCIL SITE PLAN TEST PIT LOCATIONS		Job No 84J153A Drawing No PD0006 Rev. A
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LEGEND

- P LEAD BASED PAINT
- PCB POLYCHLORINATED BIPHENYLS
- M AIR BORNE FIBRE
- A ASBESTOS
- ◆ SEDIMENT SAMPLES
- WATER SAMPLES
- Drains

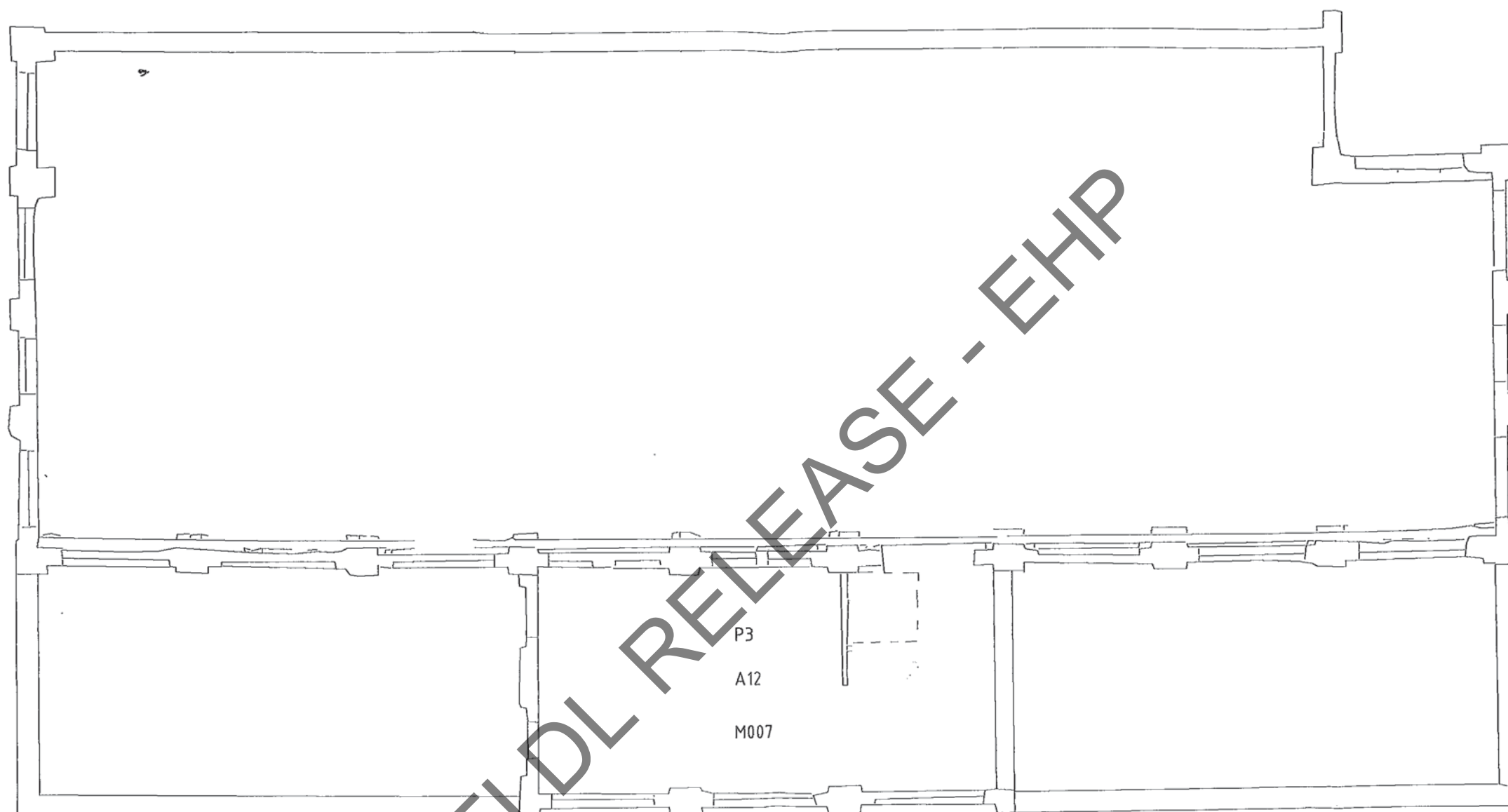
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ORIGINAL ISSUE RTI 13-106 Description	2/9/97 Date	Scale NOT TO SCALE FULL SIZE A3	Drawing No PD00001				Rev. A



LEGEND

P	LEAD BASED PAINT
PCB	POLYCHLORINATED BIPHENYLS
M	AIR BORNE FIBRE
A	ASBESTOS

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LEGEND

- P LEAD BASED PAINT
- PCB POLYCHLORINATED BIPHENYLS
- M AIR BORNE FIBRE
- A ASBESTOS

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Appendix D

Photographs (Asbestos, Lead
Paint and PCBs)



Photo 1 : Asbestos insulation debris on top of concrete plinth, Ground Floor.

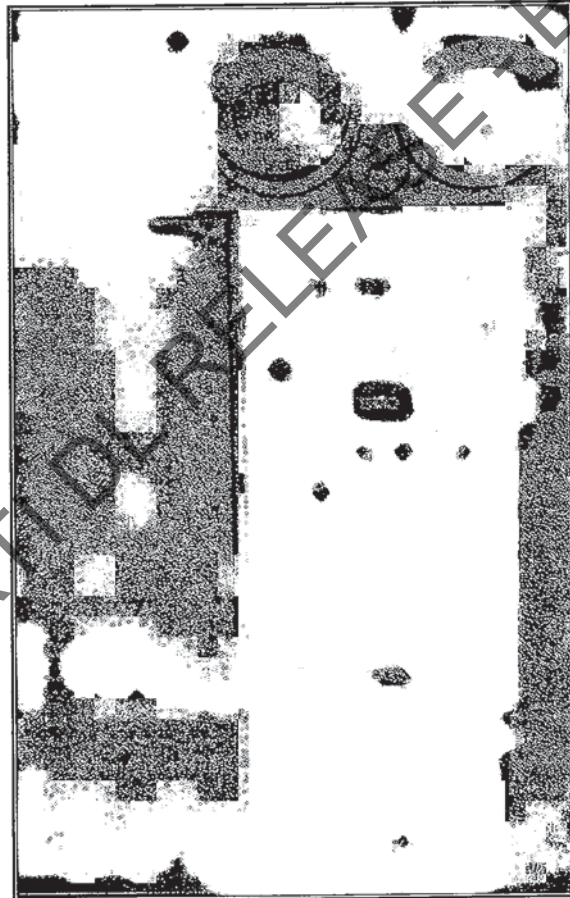


Photo 2 :

- a) Asbestos mounting board inside the electrical cabinet, Ground Floor**
- b) Asbestos millboard lining to the door of the electrical cabinet, Ground Floor**
- c) Asbestos cement arc shield inside the electrical cabinet, Ground Floor.**



Photo 3 : Asbestos cement pipe in service tunnel, Ground Floor.

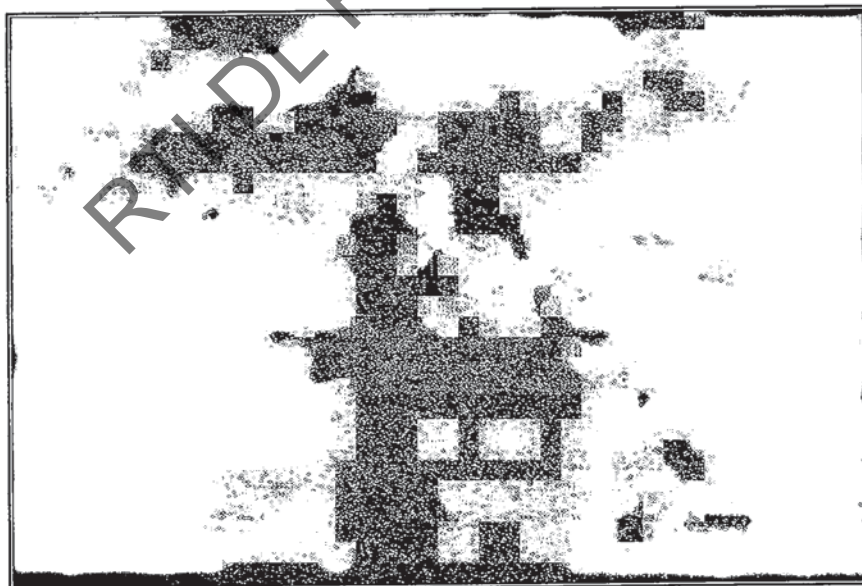


Photo 4 : Asbestos insulation debris on floor against northern wall, Level 1.

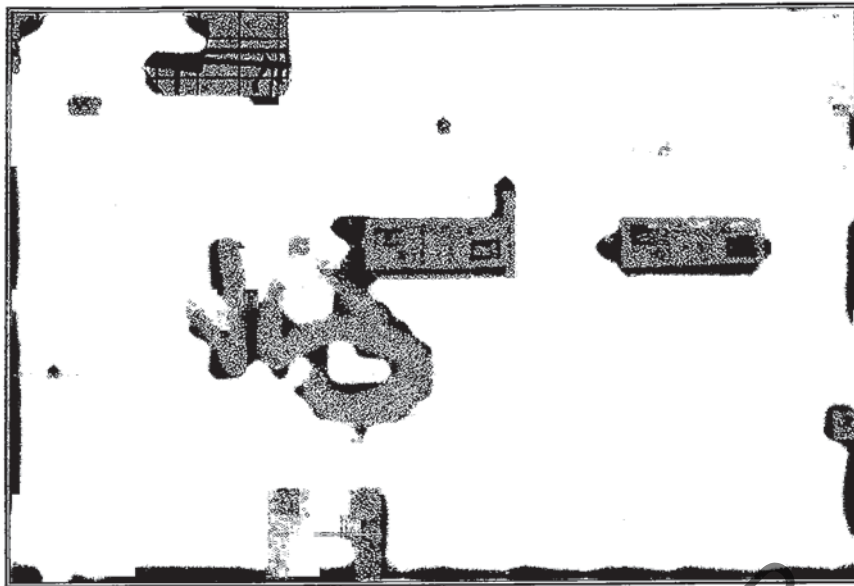


Photo 5 : Asbestos insulation in the electrical fuse socket in the Switch Room, Level 1.

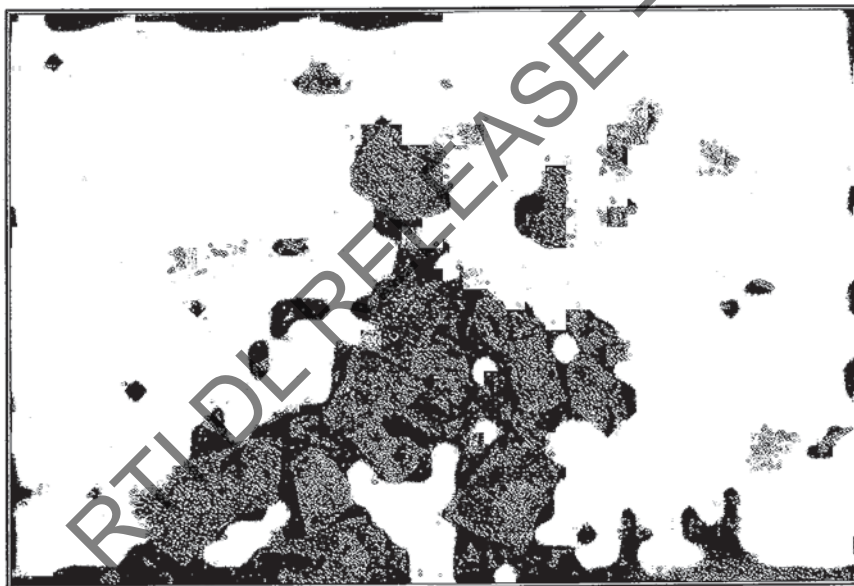


Photo 6 : Asbestos insulation debris in Switch Room, Level 1.



Photo 7 : Damaged asbestos cement wall sheeting, Level 2.



Photo 8 : Asbestos cement debris scattered over floor of south / east and south / west decks, Second Floor.

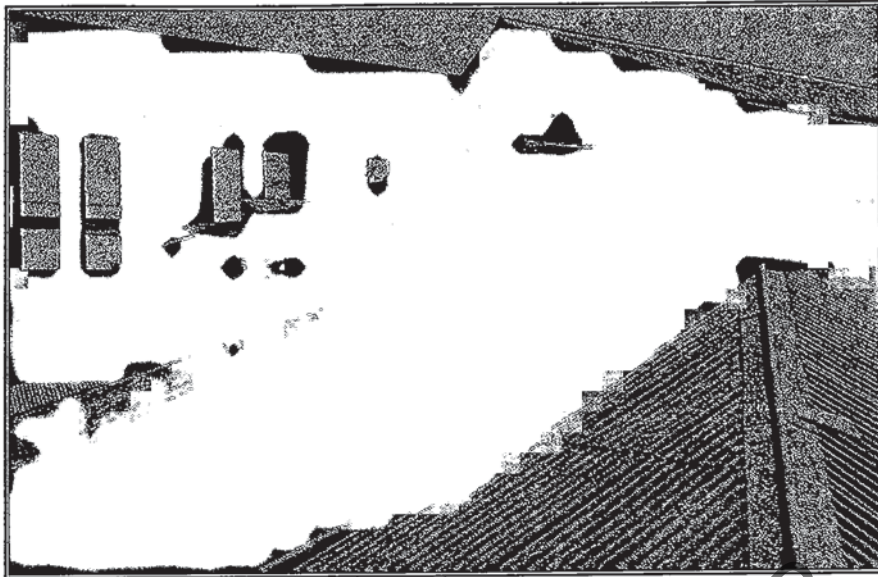


Photo 9 : Asbestos gable end, Roof.

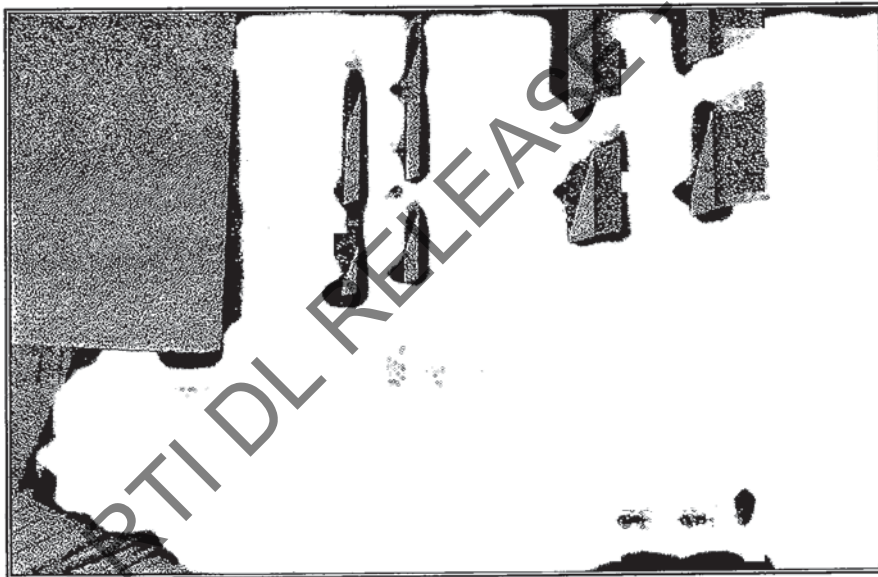


Photo 10 : Asbestos cement vent shelter, Roof.



Photo 11 : Asbestos cement eaves lining on east side of power station, Level 1 Mezzanine.

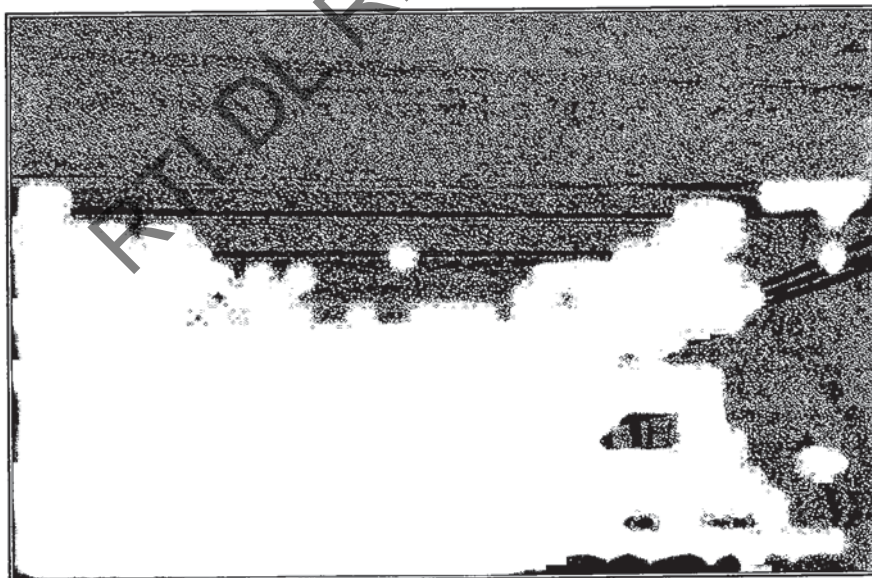


Photo 12 : Silver lead based paint on horizontal structural steel beams, Level 2.



Photo 13: Test Pit 10 (Demolished Boilerhouse)

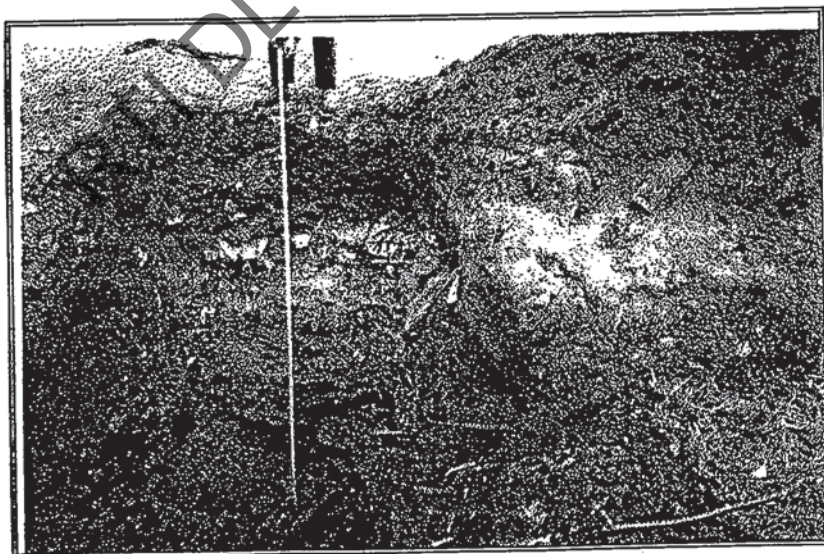


Photo 14: Test Pit 9 (Demolished Boilerhouse)

Appendix E

Analytical results (Asbestos,
Lead and PCBs)

ENVIRONMENTAL AND INDUSTRIAL SERVICES DIVISION
Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

CERTIFICATE OF ANALYSIS

Contents :

- 1) Cover Page
- 2) Analysis Report Pages
- 3) QA/QC Appendix

REPORT No : 7B00110A
ATTENTION : Mr Phil Torley
CLIENT : PPK Brisbane
SAMPLES : 11
REFERENCE : 11241/84JL53A
DATE RECEIVED : 25/08/97
DATE REPORTED : 28/08/97

<u>Method</u>	<u>Description</u>
*E032	Polychlorinated Biphenyls

RESULTS

All samples were analysed as received. This report relates specifically to the samples received.
Results relate to the source material only to the extent that the samples as supplied are truly representative of the sample source. This report replaces any preliminary results issued.
Note that for schemes indicated with * NATA registration does not cover the performance of this service.

PLEASE SEE ATTACHED PAGES FOR RESULTS

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

QA/QC APPENDIX NO. 7B00110A

Method Description

E032 Polychlorinated Biphenyls

Chromatography QA/QC

	Yes	No	N/A
Retention Time Window Within Acceptance Criteria($\pm 2\%$)			✓
Check Standard Within Acceptance Criteria($\pm 10\%$)			✓
Recalibration Within Acceptance Criteria($\pm 15\%$)			✓

Other QA/QC

Holding time conforming With Method Specification	✓
Chain of Custody Attached	✓

N/A = Not Applicable

Comments

1. Laboratory QA/QC including Duplicates, Matrix Spike Duplicates, and check/reference samples are included in this QA/QC appendix. (Where applicable)
2. Inter-Laboratory proficiency trial results available on request. (Where applicable)
3. Surrogate description and recoveries are recorded in the Report. (Where applicable)
4. Acceptance criteria for specific analytes as are listed on each QA/QC page.
5. Practical Quantitation Limit (PQL is typically 2-10 x method detection limit (MDL)
6. PQL's are matrix dependent and are increased accordingly where sample extracts are diluted.
7. Results are uncorrected for matrix spike or surrogate recoveries.

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney



INDUSTRIAL AND ENVIRONMENTAL SERVICES DIVISION
Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

Client: PPK Brisbane	Our Ref: 7B00110A
Your Ref: 11241/84JI53A	Date: 28/08/97

SAMPLE DISPOSAL ADVICE

All samples remain the client's property after analysis. These will be either returned or disposed of (at the client's cost where applicable) following analysis.

Please indicate your requirements below.

1. RETURN SAMPLES TO CLIENT ☐
2. DISCARD AFTER * 6 Weeks - Soils ☐
* 4 Weeks - Waters ☐
3. DISCARD IMMEDIATELY ☐

* Storage times commence from date of issue of the final report.

RETURN TO FOLLOWING ADDRESS _____

TRANSPORT COMPANY _____

PLEASE NOTE *If this advice slip is not returned within 15 days, it will be assumed that the samples referenced above can be discarded after indicated storage times (*)*

Authorised Signature _____

Please return to

Ross Dewar
AMDEL Ltd
P.O. Box 514
HORNSBY N.S.W. 2077
or fax to (02) 9482 1734

ENVIRONMENTAL AND INDUSTRIAL SERVICES DIVISION
Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

CERTIFICATE OF ANALYSIS

Contents :
1) Cover Page
2) Analysis Report Pages
3) QA/QC Appendix

REPORT No : 7B00110
ATTENTION : Mr Phil Torley
CLIENT : Rust PPK Brisbane
SAMPLES : 10
REFERENCE : 11241/84JI53A
DATE RECEIVED : 30/07/97
DATE REPORTED : 04/08/97

<u>Method</u>	<u>Description</u>
*E363	Metals in Paint
E033	Polychlorinated Biphenyls (High Levels)

RESULTS

All samples were analysed as received. This report relates specifically to the samples received. Results relate to the source material only to the extent that the samples as supplied are truly representative of the sample source. This report replaces any preliminary results issued. Schemes indicated above with * are not covered by NATA registration for this laboratory.

PLEASE SEE ATTACHED PAGES FOR RESULTS

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

[illegible]

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = Less than PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified

Leachates : mg/L (ppm) in leachate

QA/QC APPENDIX NO. 7B00110

<u>Method</u>	<u>Description</u>
E363	Metals in Paint

Chromatography QA/QC

	Yes	No	N/A
Retention Time Window Within Acceptance Criteria($\pm 2\%$)	✓		
Check Standard Within Acceptance Criteria($\pm 10\%$)	✓		
Recalibration Within Acceptance Criteria($\pm 15\%$)	✓		

Other QA/QC

Holding time conforming With Method Specification	✓
Chain of Custody Attached	✓

N/A=Not Applicable

Comments

1. Laboratory QA/QC including Duplicates, Matrix Spike Duplicates, and check/reference samples are included in this QA/QC appendix. (Where applicable)
2. Inter-Laboratory proficiency trial results available on request. (Where applicable)
3. Surrogate description and recoveries are recorded in the Report. (Where applicable)
4. Acceptance criteria for specific analytes as are listed on each QA/QC page.
5. Practical Quantitation Limit (PQL is typically 2-10 x method detection limit (MDL)
6. PQL's are matrix dependent and are increased accordingly where sample extracts are diluted.
7. Results are uncorrected for matrix spike or surrogate recoveries.

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

QAQC : Matrix Spike / Check Solution

[illegible]

PQL = Practical Quantitation Limit

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm)

nd = Not Detected
 _ = Not Applicable

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 4th Edition 1/7/97

CERTIFICATE OF ANALYSIS

CLIENT: Brisbane City Council.
SAMPLED BY: Phil Torley
CONTACT: Felicity Boevink
LOCATION: Newfarm Power Station.

JOB NO: 84J153A

DATE RECEIVED: 28/07/97

TEST METHOD: Filters examined at Rust PPK's Queensland Laboratory in accordance with N.O.H.S.C. (August 1988) Code of Practice for Membrane Filter Method Estimating Airborne Asbestos Dust, Rust PPK's Laboratory Method No. 2, and N.A.T.A Registration No.9607. N.A.T.A does not register sampling.

Work In Progress Monitoring Results

<u>Lab</u> <u>Number</u>	<u>Location</u>	<u>Result</u> <u>(Fibres/Field)</u>	<u>Concentration</u> <u>(Fibres/mL)</u>
M001	Lowerground. (SE)	6.5 / 100	< 0.01
M002	Lowerground. (SW)	3 / 100	< 0.01
M003	Level 1 (W)	1.5 / 100	< 0.01
M004	Level 1 (E)	2 / 100	< 0.01

NB If Asbestos type unidentified Worksafe Australia occupational Exposure Standard = 0.1 fibres/ml. This exposure standard should be compared against occupational results only.



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Approved Signatory
Authorisation Date
05/08/97

PPK Environment & Infrastructure Pty Ltd

12th Floor IBM Centre
348 Edward Street
Brisbane QLD 4000
GPO Box 2907 Brisbane
QLD 4000 Australia
Telephone 07 3218 2222
Int Tel +61 7 3218 2222
Facsimile 07 3831 4223
Email ppkbris@ozemail.com.au

ACN 078 004 798
A NATA Certified Quality Company

CERTIFICATE OF ANALYSIS

CLIENT: Brisbane City Council.
SAMPLED BY: Phil Torley
CONTACT: Felicity Boevink
LOCATION: Newfarm Power Station.
TEST METHOD:

JOB NO: 84J153A-1

DATE RECEIVED: 29/07/97

Filters examined at Rust PPK's Queensland Laboratory in accordance with N.O.H.S.C. (August 1988) Code of Practice for Membrane Filter Method Estimating Airborne Asbestos Dust, Rust PPK's Laboratory Method No. 2, and N.A.T.A Registration No.9607. N.A.T.A does not register sampling.

Work In Progress Monitoring Results

<u>Lab</u> <u>Number</u>	<u>Location</u>	<u>Result</u> <u>(Fibres/Field)</u>	<u>Concentration</u> <u>(Fibres/mL)</u>
M005	Lowerground. (E)	2.5 / 100	< 0.01
M006	Ground Floor. (NW)	2 / 100	< 0.01
M007	Level 2, Switch Room.	1.5 / 100	< 0.01
M008	Level 1, Fuse Room.	3 / 100	< 0.01

NB If Asbestos type unidentified Worksafe Australia occupational Exposure Standard = 0.1 fibres/ml. This exposure standard should be compared against occupational results only.



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Authorisation Date
05/08/97

Certificate of Analysis

CLIENT: Brisbane City Council.

JOB NO: 84J153A

SAMPLED BY: Phil Torley

DATE RECEIVED: 30/07/97

CONTACT: Felicity Boevink.

LOCATION: Newfarm Power Station.

TEST METHOD: Qualitative identification of asbestos types in bulk samples at Rust PPK's Queensland Laboratory by polarised light microscopy, including dispersion staining techniques using Rust PPK's in-house method No.1 and N.A.T.A registration No.9607. N.A.T.A. does not register sampling.

Lab Number	Client ID	Sample Description	Sample Dimensions cm	Identification Type
M001	1	Resinous material	3 X 3	NAD
M002	2	Fibre Cement Sheeting	3 X 3	CH, A
M003	3	Putty	3 X 2	NAD
M004	4	Fibre Cement Sheeting	5 X 4	CH
M005	5	Resinous material	3 X 3	NAD
M006	6	Insulation	2 X 1	NAD
M007	7	Fibre Cement Sheeting	4 X 3	CH, A, C
M008	8	Fibre Cement Sheeting	2 X 2	CH
M009	9	Resinous Board	3 X 2	NAD
M010	10	Rope	0.5 X 0.5	NAD
M011	11	Resinous material	1 X 0.5	CH

LEGEND

- NAD - No Asbestos Detected
- CH - Chrysotile Asbestos Detected
- A - Amosite Asbestos Detected
- C - Crocidolite Asbestos Detected
- UMF - Unknown Mineral Fibres Detected



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Approved Signatory

AUTHORISATION DATE

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NB: If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

PPK Environment & Infrastructure Pty Ltd

12th Floor IBM Centre
348 Edward Street
Brisbane QLD 4000
GPO Box 2907 Brisbane
QLD 4000 Australia
Telephone 07 3218 2222
Int Tel +61 7 3218 2222
Facsimile 07 3831 4223
Email ppkbris@ozemail.com.au

ACN 078 004 788
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Certificate of Analysis

CLIENT: Brisbane City Council. **JOB NO:** 84J153A
SAMPLED BY: Phil Torley **DATE RECEIVED:** 30/07/97
CONTACT: Felicity Boevink.
LOCATION: Newfarm Power Station.
TEST METHOD: Qualitative identification of asbestos types in bulk samples at Rust PPK's Queensland Laboratory by polarised light microscopy, including dispersion staining techniques using Rust PPK's in-house method No.1 and N.A.T.A registration No.9607. N.A.T.A. does not register sampling.

M012	12	Fibre Cement Sheetting	3 X 3	CH
M013	13	Insulation	2 X 2	CH, C
M014	14	Rope	1 X 1	NAD
M015	15	Insulation	2 X 2	CH
M016	16	Resinous Board	1.5 X 1	CH
M017	17	Insulation	1 X 1	CH
M018	18	Insulation	3 X 1	CH
M019	19	Resinous material	2 X 2	NAD
M020	20	Insulation	2 X 2	CH
M021	21	Fibre Cement Sheetting	2 X 1	CH
M022	22	Resinous Board	1 X 0.5	CH
M023	23	Insulation	4 X 1	CH
M024	24	Gasket	3 X 2	CH

LEGEND

NAD - No Asbestos Detected
CH - Chrysotile Asbestos Detected
A - Amosite Asbestos Detected
C - Crocidolite Asbestos Detected
UMF - Unknown Mineral Fibres Detected



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AUTHORISATION DATE

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PPK Environment & Infrastructure Pty Ltd

12th Floor IBM Centre
348 Edward Street
Brisbane QLD 4000
GPO Box 2907 Brisbane
QLD 4000 Australia
Telephone 07 3218 2222
Int Tel +61 7 3218 2222
Facsimile 07 3831 4223
Email ppkbris@ozemail.com.au

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Certificate of Analysis

CLIENT: Brisbane City Council

JOB NO: 84J153A-2

SAMPLED BY: As received

DATE RECEIVED: 24/09/97

CONTACT: Felicity Boevink

LOCATION: New Farm Power Station

TEST METHOD: Qualitative identification of asbestos types in bulk samples at PPK's Queensland Laboratory by polarised light microscopy, including dispersion staining techniques using PPK's in-house method No.1 and N.A.T.A registration No.9607. N.A.T.A. does not register sampling.

<u>Lab Number</u>	<u>Client ID</u>	<u>Sample Description</u>	<u>Sample Dimensions</u> cm	<u>Identification Type</u>
M001	TP9 (1.4-1.5m)	Soil	N/A	NAD
M002	TP10 (2.2-2.4m)	Soil	N/A	CH, Handpicked approx. dia. 5mm x 3mm x 2mm

LEGEND

- NAD - No Asbestos Detected
- CH - Chrysotile Asbestos Detected
- A - Amosite Asbestos Detected
- C - Crocidolite Asbestos Detected
- UMF - Unknown Mineral Fibres Detected

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sch4p4(6) Personal information

Approved Signatory

AUTHORISATION DATE

24/09/97

NB: If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

Page 1 of 1

Appendix F

Asbestos Register

Asbestos Register

Lower Ground Floor

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Fill material at the side of lower floor area on southern side	Debris	Insulation material	Poor	Yes	Immediate	Unknown	CH	Refer 20	-	Significant quantities of asbestos debris are present in the soil on northern edge next to steps. This material may be scattered throughout the lower ground floor area, which is presently submerged in 300mm water.

Ground Floor

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Third column from west end	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH	Refer 20	-	
Back of column from west end	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH	20	-	Debris at base of column is visually consistent with debris on column. Some material evident around base of several other columns.
Throughout ground floor	Debris	Fibre cement sheeting	Poor	No	Medium	<1m ²	CH,A,C	Refer 7	-	Scattered over floor surface
On top of concrete plinth on northern wall	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH	Refer 20	1	
Electrical Cabinet, eastern wall	Arc shields	Fibre cement sheeting	Fair	No	Medium	<1m ²	CH	21	2	Four Arc shields
Electrical Cabinet, eastern wall	Electrical mounting board	Resinous board	Fair	No	Medium	<1m ²	CH	22	2	

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Electrical Cabinet, eastern wall	Insulation to cabinet door	Millboard	Poor	Yes	High	1m ²	CH	23	2	Internal thermal lining to cabinet door
1st small room, south-east corner	Debris	Fibre cement sheeting	Poor	No	Medium	2m ²	CH,A,C	Refer 7	-	Broken fibre cement sheeting and resinous membrane scattered over floor surface
1st small room, south-east wall	Gasket	Gasket	Fair	No	Medium	1m ²	CH	24	-	These and other gaskets are scattered throughout ground floor area.
2nd small room, south wall	Insulation to electrical cable	Insulation material	Poor	Yes	N/A	1m ²	NAD	Refer 25	-	
South wall	Insulation to electrical cable	Insulation material	Poor	Yes	N/A	Unknown	NAD	25	-	Cables may also extend below ground, widespread throughout power station
South wall	Fuse insulation	Textile	Poor	Yes	High	10m ²	CH	26	-	Widespread throughout area
Tunnel - west wall	Gutter Down pipe	Compressed sheet	Fair	No	Medium	2 linear meters	CH	27	3	Unsealed

First Floor (Level 1)

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Elevated Floor Slab on south side	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH,C	13	4	
Gantry Crane	Electrical mounting board	Resinous board	Fair	No	N/A	1m ²	NAD	Refer 9	-	
Gantry Crane	Brake pads	Compressed sheet	Fair	No	N/A	<1m ²	NAD	14	-	Large brake drum on Gantry Crane
Throughout first floor	Debris	Fibre cement sheet	Poor	No	Medium	40m ²	CH,A,C,	Refer 7	-	Damaged fibre cement sheeting scattered over entire floor surface
Recess in north wall	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH,C	Refer 13	-	

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Hole at base of north wall near elevated platform	Debris	Insulation material	poor	Yes	Immediate	<1m ²	CH,C	Refer 13	18/1	
Switch Room, south east corner	Electrical mounting board	Resinous board	Fair	No	Medium	2m ²	CH	16	-	
Switch Room, south east corner	Insulation to electrical cable	Insulation material	Poor	Yes	N/A	5m ²	NAD	Refer 10	-	
Outside Transformer Room Passage	Debris	Resinous membrane	Poor	Yes	N/A	2m ²	NAD	Refer 5	-	Torn resinous membrane lying on floor surface
Switch Room, south west corner	Insulation to fuse socket	Textile	Fair	Yes	High	2m ²	CH	17	5	
Switch Room, south west corner	Insulation to fuse hood	Millboard	Fair	Yes	High	2m ²	CH	18	-	
Switch Room, south west corner	Debris	Millboard	Poor	Yes	Immediate	2m ²	CH	Refer 17 and 18	6	Asbestos millboard castings are scattered over entire floor. Similar situations are present in either switch rooms.
LT Board Room, south west corner on floor	Debris	Textile	Poor	Yes	High	1m ²	CH	Refer 17	-	
Empty room, south west corner	Floor covering	Resinous membrane	Poor	No	N/A	15 m ²	NAD	19	-	
Electrical Cabinet, south wall of Turbine Room	Arc Shields	Fibre cement sheeting	Fair	No	Medium	1m ²	CH	Refer 21	-	Arc shields are unsealed

First Floor (Level 1) Mezzanine

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Mezzanine Floor surface	Debris	Fibre cement sheeting	Poor	No	Medium	1m ²	CH	Refer 28	-	Broken fibre cement sheeting scattered on floor originates from leaves lining

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
South side of Mezzanine	Insulation to electrical mounting board	Millboard	Poor	Yes	High	<1m ²	CH	15	-	Thermal lining inside electrical box

Second Floor (Level 2)

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Floor Partition Walls	Wall lining	Fibre cement sheeting	Poor	No	Medium	30m ²	CH	12	7	Badly damaged fibre cement sheeting, debris scattered over floor surface
Switch Room	Insulation to electrical cable	Insulation material	Poor	Yes	N/A	2m ²	NAD	Refer 10	-	

Second Floor (Level 2) Mezzanine

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Support column alongside Gantry	Debris	Dust	Poor	Yes	N/A	< 1m ²	NAD	6	-	Debris situated at base of support column
Throughout Mezzanine	Ceiling lining	Fibre cement sheeting	Poor	No	Medium	240 m ²	CH,A,C	7	-	Several sheets smashed and badly damaged
Switch Room	Lower wall lining	Fibre cement sheeting	Fair	No	Medium	40 m ²	CH	8	-	
Switch Room	Electrical mounting board	Resinous board	Fair	No	N/A	6 m ²	NAD	9	-	Light brown coloured mounting board
Switch Room	Insulation to electrical cable	Insulation material	Poor	Yes	N/A	Numerous cables	NAD	10	-	Cables located inside switchboards
Switch Room	Electrical mounting	Resinous	Fair	No	Medium	2 m ²	CH	11	-	Dark coloured mounting boards

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
	board	board								
Throughout Mezzanine	Debris	Fibre cement sheeting	poor	No	Medium	10 m ²	CH,A,C	Refer 7	-	Broken AC debris scattered over floor surface

External

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
2nd floor S/W deck	Floor covering	Resinous membrane	Poor	No	N/A	240 m ²	NAD	1	-	
2nd floor S/W deck	Debris	Fibre cement sheeting	Poor	No	Medium	3m ²	CH,A	2	8	Broken fibre cement sheeting scattered over deck floor, appears to originate from switchroom
2nd floor S/W deck	Sealant	Fibrous Putty	Poor	No	N/A	2m ²	NAD	3	-	Putty in windows around entire building
2nd floor S/E deck	Floor covering	Resinous membrane	Poor	No	N/A	240 m ²	NAD	Refer 1		
2nd floor S/E deck	Debris	Fibre cement sheeting	Poor	No	Medium	3m ²	CH,A	Refer 2		Broken fibre cement sheeting scattered over deck floor. Appears to originate from switchroom
2nd floor S/Edeck	Sealant	Fibrous putty	Poor	No	N/A	2m ²	NAD	Refer 3		Putty in windows around entire building
Roof	Gable end	Fibre cement sheeting	Poor	No	Medium	10m ²	CH	4	9	Fibre cement sheeting is badly damaged one at east and west ends of roof
Roof	Debris	Fibre cement sheeting	Poor	No	Medium	10m ²	CH	Refer 4	9	Broken fibre cement sheeting scattered over east and west ends of roof
Roof flashing	Membrane beneath flashing	Resinous membrane	Fair	No	N/A	15m ²	NAD	5	-	
Roof - north side	Wall lining	Fibre cement sheeting	Poor	No	Medium	40m ²	CH	Refer 4	10	

Surrounding Grounds

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Perimeter of Building	Debris	Fibre cement sheeting	Poor	No	Medium	10m ²	CH,A,C	Refer 10	-	Fibre cement sheeting debris scattered around building
East Wall	Eaves lining	Fibre cement sheeting	Poor	No	Medium	22m ²	CH	28	11	Eaves lining is badly damaged

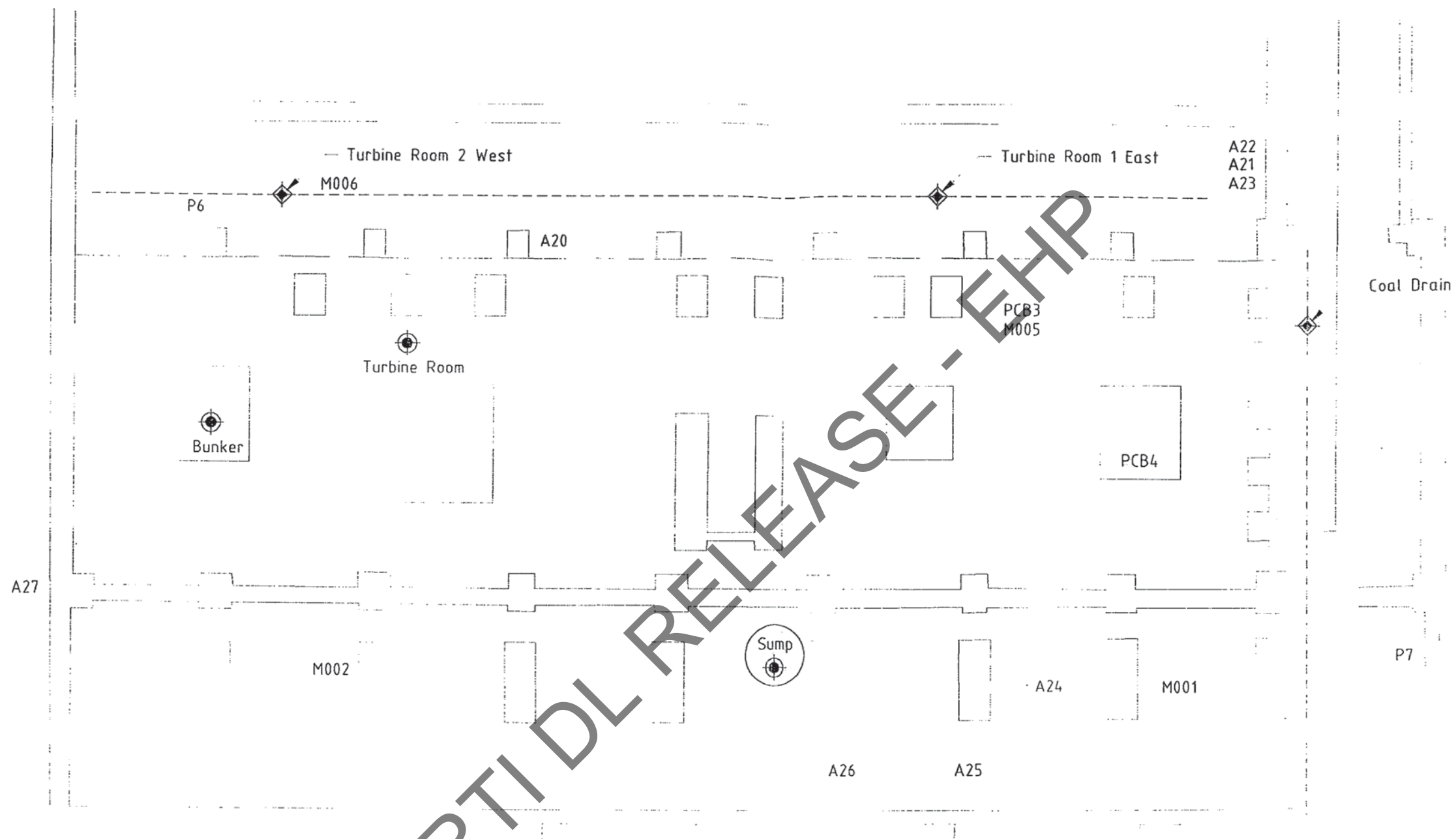
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Appendix G

Soil Sample Locations

Appendix G

Soil Sample Locations



LEGEND

- P LEAD BASED PAINT
- PCB POLYCHLORINATED BIPHENYLS
- M AIR BORNE FIBRE
- A ASBESTOS
- ◆ SEDIMENT SAMPLES
- WATER SAMPLES

Drawings

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Collection 15

NOT TO SCALE
FULL SIZE A3

PPK
Env & Infrastructure

PPK Environment & Infrastructure Pty Ltd
ACN 212 224 798

12th Floor IBM Centre
348 Edward Street
Brisbane QLD 4000
G.P.O. Box 2907
Brisbane
QLD 4000 Australia
Tel. 07 3218 2222
Fax 07 3831 4223
Email ppkbris@emil.com.au

NEWFARM POWERSTATION ESA
BRISBANE CITY COUNCIL

GROUND FLOOR
SAMPLE POINTS

Job No
84J153A
Drawing No
PD0001
Rev
A

Page 148

RTI13-106

2/9/97

Test Pit Log - TP1

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GROUND LEVEL		0.0		GENERAL INFORMATION LOCATION: New Farm Powestation Lamington Road Newfarm QLD DATE EXCAVATED 31 July 1997
Concrete		0.4	TP1;0.5-0.6m	
Clay. Light brown, moist, soft sandy silty clay.		1.0		NOTES EQUIPMENT USED Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
Clay. Dark brown-grey moist soft silty clay.		1.4	TP1;1.4-1.6m	
Clay. Dark brown-orange brown moist soft silty clay. Water intersected 2.5m.		1.9 2.0		
Test Pit Terminated		2.5	TP1; 2.2-2.5m	
		3.0		
		4.0		
TEST PIT TP1				
Logged By: [redacted] Personal information		Sampled By: [redacted] Personal information		 PPK Environment & Infrastructure
Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour		Notes		
JOB NO. 84J153B DRG.				

Test Pit Log - TP2 New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GROUND LEVEL 0.0		0.0		GENERAL INFORMATION
Fill. Orange brown soft dry gravelly sand. Some brick glass and cans. Old water hose.			TP2; 0.3-0.5m	LOCATION: New Farm Powestation Lamington Road Newfarm QLD
			TP2; 0.8-1.0m	DATE EXCAVATED 31 July to 1 August 1997
Concrete		1.0		NOTES
		1.2		EQUIPMENT USED
Fill. Light brown stiff dry sandy fill with some ash.			TP2; 1.5-1.6m	Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
		1.6		
Clay. Dark grey soft moist sandy silty clay			TP2; 2.3-2.4m	
		2.4		
Test Pit Terminated				
				TEST PIT TP2
Logged By: [Personal information]	Sampled By: [Personal information]			
Field Classification	Notes			
0 No obvious contamination				JOB NO. 84J153B DRG. NO. test_tp2
1 Slight visual contamination and/or slight odour				
2 Visual contamination and/or odour				
3 Gross visual contamination and/or strong odour				

Test Pit Log - TP4

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
<div><div>GROUND LEVEL</div><div>0.0</div><div>0.0</div><div>0.5</div><div>1.7</div><div>2.5</div><div>2.8</div><div>3.0</div><div>4.1</div></div> <div>TP4; 0.3-0.4m</div> <div>TP4; 0.8-0.9</div> <div>TP4; 2.8-2.9</div>				GENERAL INFORMATION LOCATION: New Farm Powestation Lamington Road Newfarm QLD DATE EXCAVATED 31 July 1997
				NOTES EQUIPMENT USED Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
Test Pit Terminated				TEST PIT TP4
Logged by: [redacted] Personal information		Sampled by: [redacted] Personal information		<div>PPK</div> <div>Environment & Infrastructure</div> <div>JOB NO. 84J153B DRG. NO. test_tp4</div>
Field Classification		Notes		
0 No obvious contamination				
1 Slight visual contamination and/or slight odour				
2 Visual contamination and/or odour				
3 Gross visual contamination and/or strong odour				

Test Pit Log - TP5 New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GROUND LEVEL		0.0		GENERAL INFORMATION
Fill. Dark brown soft dry clay with some slag. Old asbestos pipe.		0.0	TP5; 0.5-0.6m	LOCATION: New Farm Powestation Lamington Road Newfarm QLD
		0.7		DATE EXCAVATED 31 July 1997
Fill. Dark brown soft dry sandy clay with some ash and slag			TP5; 0.9-1.0m	NOTES
		1.9		EQUIPMENT USED
Fill. Dark brown soft dry sandy clay. Large pieces of rubble			TP5; 2.1-2.3m	Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
		2.7		
Fill. Dark brown soft dry sandy clay with much ash and some rubble. Old railway line at 3.1m			TP5; 2.9-3.0m	
		3.6		
Fill. Light grey gravelly clay with much ash and some gravel.			TP5; 3.5-3.6m	
Clay. Red brown mottled firm moist sandy clay.		3.9		
		4.0	TP5; 3.8-4.0m	
Test Pit Terminated				
TEST PIT TP5				
Logged By Personal information	Sampled By Personal information			
Field Classification	Notes			
0 No obvious contamination				JOB NO. 84J153B DRG. NO. test_tp5
1 Slight visual contamination and/or slight odour				
2 Visual contamination and/or odour				
3 Gross visual contamination and/or strong odour				

Test Pit Log - TP6 New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GROUND LEVEL		0.0		GENERAL INFORMATION LOCATION: New Farm Powestation Lamington Road Newfarm QLD DATE EXCAVATED 1 August 1997
Fill. Light grey brown soft dry sandy clay with some gravel, broken brick, rags, old water pipe, broken asbestos sheet.		0.5	TP6; 0.3-0.4m	
Fill. Asbestos lagging debris with rare sandy clay.		0.8	TP6; 0.5-0.6m	NOTES EQUIPMENT USED Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
Fill. Dark grey black boiler ash		0.9	TP6; 0.8-0.9m	
Fill. Light grey boiler ash		1.0	TP6; 0.9-1.0m	
Fill. Light brown soft dry sandy gravel		1.2	TP6; 1.9-1.2m	
Fill. Light grey boiler ash with minor vitreous slag.		2.0	TP6; 1.3-1.4m	
		2.7	TP6; 2.0-2.1m	
Clay. Brown orange soft moist sandy gravelly clay with much gravel.		3.6		
		3.9	TP6; 4.0-4.1m	
		4.1		
Test Pit Terminated				
Logged By: [redacted] Personal information				TEST PIT TP6 PPK Environment & Infrastructure JOB NO. 84J153B DRG. NO. test_tp6
Field Classification		Notes		
0 No obvious contamination				
1 Slight visual contamination and/or slight odour				
2 Visual contamination and/or odour				
3 Gross visual contamination and/or strong odour				

Test Pit Log - TP7 New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GROUND LEVEL		0.0		GENERAL INFORMATION LOCATION: New Farm Powestation Lamington Road Newfarm QLD DATE EXCAVATED 1 August 1997
Fill. Dark brown sandy loam topsoil		0.2	TP7; 0.2-0.3m	
Fill. Grey dry soft boiler ash		0.3		NOTES EQUIPMENT USED Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
Fill. Light brown orange soft dry sandy gravel. Old water pipe			TP7; 0.8-0.9m	
		1.2		
Fill. Dark brown soft moist silty sand with boulders up to 60x60x20cm size.			TP7; 1.9-2.0m	
		2.1		
Fill. Dark grey brown soft wet clayey gravel.			TP7; 3.0-3.1m	
Test Pit Terminated		3.1		
Logged By: [Redacted] Personal information Sampled By: [Redacted] Personal information				TEST PIT TP7
Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour				 PPK Environment & Infrastructure
Notes				JOB NO. 84J153B DRG. NO. test_tp7

Test Pit Log - TP8 New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
<p>GROUND LEVEL</p> <p>0.0</p> <p>Fill. Dark brown soft moist sandy gravelly clay with much brick boulders and rock.</p>		0.0		<p>GENERAL INFORMATION</p> <p>LOCATION: New Farm Powestation Lamington Road Newfarm QLD</p> <p>DATE EXCAVATED 1 August 1997</p>
<p>Clay. Dark grey wet soft sandy gravelly clay. Water 1.8 m.</p> <p>▼</p>		1.6	TP8; 1.2-1.3m	<p>NOTES</p> <p>EQUIPMENT USED</p> <p>Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.</p>
<p>Test Pit Terminated</p>		2.0	TP8; 1.9-2.0m	
		3.1		
<p>Logged by: [redacted] Personal information</p> <p>Field Classification</p> <p>0 No obvious contamination</p> <p>1 Slight visual contamination and/or slight odour</p> <p>2 Visual contamination and/or odour</p> <p>3 Gross visual contamination and/or strong odour</p>	<p>Sampled by: [redacted] Personal information</p> <p>Notes</p>	<p>TEST PIT TP8</p> <p>PPK Environment & Infrastructure</p> <p>JOB NO. 84J153B DRG. NO. test_tp8</p>		

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Test Pit Log - TP9

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GROUND LEVEL		0.0		GENERAL INFORMATION LOCATION: New Farm Powestation Lamington Road Newfarm QLD DATE EXCAVATED 31 July 1997
Fill. Dark brown sandy loam, some plasterboard		0.25	TP9; 0.3-0.4m TP9; 0.3-0.5m	
Fill. Light grey brown soft dry clayey sandy gravel with much rubble.		1.2	TP9; 1.4-1.5m	NOTES EQUIPMENT USED Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
Fill. Light brown soft dry gravelly loam. Much building rubble		2.2	TP9; 2.1-2.3m	
Fill. Light brown grey soft dry silty sandy gravel. Much building rubble		2.6	TP9; 3.9-4.0m	
Fill. Orange brick building rubble		4.5	TP9; 4.1-4.3m	
Test Pit Terminated Concrete				
TEST PIT TP9				
Logged By: [redacted] Personal information		Sampled By: [redacted] Personal information		 PPK Environment & Infrastructure
Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour		Notes		
JOB NO. 84J153B DRG. NO. test_tp9				

Test Pit Log - TP10

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GROUND LEVEL		0.0		GENERAL INFORMATION LOCATION: New Farm Powestation Lamington Road Newfarm QLD DATE EXCAVATED 31 July 1997
Fill. Grey soft dry boiler ash with some rubble.		0.3	TP10; 0.2-0.3m TP10; 0.3-0.4m	
Fill. Light brown soft dry gravelly clay		1.2		NOTES EQUIPMENT USED Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
Fill. Brown grey building rubble with bitumen, concrete, brick glass.		1.8	TP10; 1.4-1.5m TP10; 1.8-1.9m	
Fill. Red orange brick and building rubble. Old sign, pipes plaster board.			TP10; 2.2-2.4m TP10; 2.6-2.8m	
		3.7		
Test Pit Terminated Concrete				TEST PIT TP10
Logged By: [redacted] Personal information	Sampled By: [redacted] Personal information		 JOB NO. 84J153B DRG. NO. test_tp10	
Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour	Notes			

Appendix I

Original Laboratory Results

ENVIRONMENTAL AND INDUSTRIAL SERVICES DIVISION

Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

CERTIFICATE OF ANALYSIS

Contents :

- 1) Cover Page
- 2) Analysis Report Pages
- 3) QA/QC Appendix

REPORT No : 7B00114
ATTENTION : Mr Steve Robertson
CLIENT : Rust PPK Brisbane
SAMPLES : 54
REFERENCE : 84JI53B
DATE RECEIVED : 04/08/97
DATE REPORTED : 08/08/97

<u>Method</u>	<u>Description</u>
B1042	Moisture (%w/w)
E084	Total Petroleum Hydrocarbons
E092	Polynuclear Aromatic Hydrocarbons
E511	pH in Soil
E340	Metals in Soils
M350S	Mercury
E504	*Total Cyanide in Soil
E031	Polychlorinated Biphenyls
E083	Total Petroleum Hydrocarbons
E370	Total Metals in Water
M350W	Mercury
W031	pH
E012	Organochlorine Pesticides and PCBs

RESULTS

All samples were analysed as received. This report relates specifically to the samples received. Results relate to the source material only to the extent that the samples as supplied are truly representative of the sample source. This report replaces any preliminary results issued. Schemes indicated above with * are not covered by NATA registration for this laboratory.

PLEASE SEE ATTACHED PAGES FOR RESULTS

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

Job Number : 7B00114
Client : Rust PPK Brisbane
Reference : 84JI53B

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plus Cover Page

Analyte	Lab No	E27840	E27843	E27845	E27847	E27849
		TP6	TP6	TP7	TP7	TP8
	Sample Id	0.9-1.0	2.0-2.1	0.2-0.3	1.9-2.0	1.2-1.3
	PQL					
E1042 Moisture Content %(w/w)	-	29	17	21	15	21
E084 TPH in Soil						
TPH C6-C36 as C8	-	nd	nd	nd	585	100
C6-C9 Fraction	10	nd	nd	nd	nd	nd
C10-C14 Fraction	20	nd	nd	nd	nd	nd
C15-C28 Fraction	100	nd	nd	nd	480	100
C29-C36 Fraction	100	nd	nd	nd	105	nd
pH in soil (1:5 in water)		9.1	7.7	8.1	8.8	8.8
Metals in Soil						
Arsenic	5	nd	nd	nd	nd	nd
Cadmium	1	nd	nd	nd	nd	nd
Chromium	5	nd	7	nd	9	8
Copper	5	13	nd	11	59	72
Nickel	5	nd	nd	nd	11	12
Lead	5	7	21	40	105	177
Zinc	5	18	12	24	131	164
Mercury	0.05	nd	nd	0.58	0.48	0.33
E504 Total Cyanide	0.1	0.2	--	0.2	--	--
Total Phenolics as phenol	0.1	--	--	nd	--	--

PQL = Practical Quantitation Limit
LNR = Samples Listed not Received
nd = Less than PQL
-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
Waters : mg/L (ppm) unless otherwise specified
Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
 Client : Rust PPK Brisbane
 Reference : 84JI53B

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 plus Cover Page

Analyte	Lab No	E27850	E27851	E27853	E27856	E27859
		TP8	TP2	TP2	TP5	TP5
	Sample Id	1.9-2.0	0.3-0.5	2.3-2.4	0.9-1.0	3.5-3.6
	PQL					
E1042 Moisture Content %(w/w)	-	19	49	24	18	15
E084 TPH in Soil						
TPH C6-C36 as C8	-	105	10	nd	nd	nd
C6-C9 Fraction	10	nd	10	nd	nd	nd
C10-C14 Fraction	20	nd	nd	nd	nd	nd
C15-C28 Fraction	100	105	nd	nd	nd	nd
C29-C36 Fraction	100	nd	nd	nd	nd	nd
pH in soil (1:5 in water)		8.6	9.6	8.2	8.7	8.6
Metals in Soil						
Arsenic	5	9	124	nd	nd	nd
Cadmium	1	nd	1	nd	nd	nd
Chromium	5	8	14	28	20	13
Copper	5	110	131	15	14	18
Nickel	5	15	42	23	17	14
Lead	5	2340	818	8	30	48
Zinc	5	376	1840	42	59	56
Mercury	0.05	0.12	3.9	nd	0.09	0.26
E504 Total Cyanide	0.1	--	--	--	--	--
Total Phenolics as phenol	0.1	--	--	nd	--	--

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Less than PQL
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
 Client : Rust PPK Brisbane
 Reference : 84JI53B

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 plus Cover Page

Analyte	Lab No	E27861	E27863	E27865	E27867	E27870
		TP4	TP4	TP3	TP3	TP1
	Sample Id	0.3-0.4	2.8-2.9	1.0-1.2	1.35-1.4	0.5-0.6
	PQL					
E1042 Moisture Content %(w/w)	-	14	10	21	9.9	23
E084 TPH in Soil						
TPH C6-C36 as C8	-	nd	720	nd	nd	nd
C6-C9 Fraction	10	nd	nd	nd	nd	nd
C10-C14 Fraction	20	nd	nd	nd	nd	nd
C15-C28 Fraction	100	nd	720	nd	nd	nd
C29-C36 Fraction	100	nd	nd	nd	nd	nd
pH in soil (1:5 in water)		7.5	7.9	9.0	8.6	8.3
Metals in Soil						
Arsenic	5	nd	nd	nd	nd	nd
Cadmium	1	nd	1	nd	nd	nd
Chromium	5	21	21	nd	nd	24
Copper	5	20	20	6	nd	15
Nickel	5	17	17	6	nd	19
Lead	5	40	57	12	26	8
Zinc	5	69	880	15	39	49
Mercury	0.05	0.14	0.12	nd	0.07	0.06
E504 Total Cyanide	0.1	0.2	--	0.2	--	--
Total Phenolics as phenol	0.1	--	0.8	nd	--	--

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Less than PQL
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
 Client : Rust PPK Brisbane
 Reference : 84J153B

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 plus Cover Page

Analyte	Lab No	E27872	E27873	E27876	E27879	E27882
		TP1	TP9	TP9	TP10	TP10
	Sample Id	2.2-2.5	0.3-0.4	2.1-2.3	0.2-0.3	1.8-1.9
	PQL					
E1042 Moisture Content %(w/w)	-	29	19	12	14	9.6
E084 TPH in Soil						
TPH C6-C36 as C8	-	nd	nd	nd	nd	nd
C6-C9 Fraction	10	nd	nd	nd	nd	nd
C10-C14 Fraction	20	nd	nd	nd	nd	nd
C15-C28 Fraction	100	nd	nd	nd	nd	nd
C29-C36 Fraction	100	nd	nd	nd	nd	nd
pH in soil (1:5 in water)		7.2	8.1	7.8	8.0	8.2
Metals in Soil						
Arsenic	5	nd	10	nd	nd	nd
Cadmium	1	nd	nd	nd	nd	nd
Chromium	5	26	15	23	7	5
Copper	5	18	22	19	32	27
Nickel	5	33	13	23	10	7
Lead	5	9	29	16	106	127
Zinc	5	61	72	148	124	120
Mercury	0.05	nd	0.08	0.07	0.28	0.13
E504 Total Cyanide	0.1	--	--	--	--	--
Total Phenolics as phenol	0.1	nd	--	--	--	--

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Less than PQL
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
 Client : Rust PPK Brisbane
 Reference : 84JI53B

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 plus Cover Page

Analyte	Lab No	E27885	E27886	E27887	CB	
		COAL	TURB1	TURB2	CONTROL	
	Sample Id	DRAIN	EAST	WEST	BLANK	
	PQL					
E1042 Moisture Content %(w/w)	-	7.0	47	42		
E084 TPH in Soil						
TPH C6-C36 as C8	-	nd	570	705	nd	
C6-C9 Fraction	10	nd	nd	nd	nd	
C10-C14 Fraction	20	nd	nd	nd	nd	
C15-C28 Fraction	100	nd	570	705	nd	
C29-C36 Fraction	100	nd	nd	nd	nd	
pH in soil (1:5 in water)		8.5	8.0	8.0	6.5	
Metals in Soil						
Arsenic	5	7	30	17	nd	
Cadmium	1	52	11	8	nd	
Chromium	5	16	57	48	nd	
Copper	5	282	1140	528	nd	
Nickel	5	13	88	52	nd	
Lead	5	5140	23700	24600	nd	
Zinc	5	3360	23600	28300	nd	
Mercury	0.05	2.1	291	27	nd	
E504 Total Cyanide	0.1	--	--	--	nd	
Total Phenolics as phenol	0.1	--	--	--	nd	

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Less than PQL
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
 Client : Rust PPK Brisbane
 Reference : 84JI53B

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Analyte	Lab No	E27840	E27843	E27845	E27847	E27849
		TP6	TP6	TP7	TP7	TP8
	Sample Id	0.9-1.0	2.0-2.1	0.2-0.3	1.9-2.0	1.2-1.3
	PQL					
E092 PAH's in Soil						
Naphthalene	0.5	nd	nd	nd	nd	nd
Acenaphthylene	0.5	nd	nd	nd	1.0	nd
Acenaphthene	0.5	nd	nd	nd	nd	nd
Fluorene	0.5	nd	nd	nd	nd	nd
Phenanthrene	0.5	nd	nd	nd	1.1	nd
Anthracene	0.5	nd	nd	nd	1.2	nd
Fluoranthene	0.5	nd	nd	nd	8.6	1.0
Pyrene	0.5	nd	nd	nd	10	1.0
Benzo(a)anthracene	0.5	nd	nd	nd	6.5	0.6
Chrysene	0.5	nd	nd	nd	5.3	0.5
Benzo(b)&(k)fluoranthene	1	nd	nd	nd	20	1
Benzo(a)pyrene	0.5	nd	nd	nd	9.7	0.7
Indeno(1.2.3-cd)pyrene	0.5	nd	nd	nd	12	0.8
Dibenz(a,h)anthracene	0.5	nd	nd	nd	1.7	nd
Benzo(g,h,i)perylene	0.5	nd	nd	nd	9.9	0.6
Total PAHs	-	nd	nd	nd	87	6.6
Surrogate % Recovery	-	74	78	72	98	86

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Less than PQL
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
 Client : Rust PPK Brisbane
 Reference : 84JI53B

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 plus Cover Page

Analyte	Lab No	E27850	E27851	E27853	E27856	E27859
		TP8	TP2	TP2	TP5	TP5
	Sample Id	1.9-2.0	0.3-0.5	2.3-2.4	0.9-1.0	3.5-3.6
	PQL					
E092 PAH's in Soil						
Naphthalene	0.5	nd	nd	nd	nd	nd
Acenaphthylene	0.5	nd	nd	nd	nd	nd
Acenaphthene	0.5	nd	nd	nd	nd	nd
Fluorene	0.5	nd	nd	nd	nd	nd
Phenanthrene	0.5	0.6	nd	nd	nd	nd
Anthracene	0.5	nd	nd	nd	nd	nd
Fluoranthene	0.5	1.3	nd	nd	nd	2.5
Pyrene	0.5	1.4	nd	nd	nd	2.6
Benzo(a)anthracene	0.5	0.7	nd	nd	nd	1.4
Chrysene	0.5	0.7	nd	nd	nd	1.2
Benzo(b)&(k)fluoranthene	1	2	nd	nd	nd	3
Benzo(a)pyrene	0.5	0.8	nd	nd	nd	1.5
Indeno(1.2.3-cd)pyrene	0.5	0.8	nd	nd	nd	1.4
Dibenz(a,h)anthracene	0.5	nd	nd	nd	nd	nd
Benzo(g,h,i)perylene	0.5	0.8	nd	nd	nd	1.2
Total PAHs	-	8.7	nd	nd	nd	15
Surrogate % Recovery	-	81	98	92	104	105

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Less than PQL
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
 Client : Rust PPK Brisbane
 Reference : 84JI53B

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 plus Cover Page

Analyte	Lab No	E27861	E27863	E27865	E27867	E27870
		TP4	TP4	TP3	TP3	TP1
	Sample Id	0.3-0.4	2.8-2.9	1.0-1.2	1.35-1.4	0.5-0.6
	PQL					
E092 PAH's in Soil						
Naphthalene	0.5	nd	3.9	nd	nd	nd
Acenaphthylene	0.5	nd	0.8	nd	nd	nd
Acenaphthene	0.5	nd	6.6	nd	nd	nd
Fluorene	0.5	nd	9.0	nd	nd	nd
Phenanthrene	0.5	nd	65	nd	nd	nd
Anthracene	0.5	nd	13	nd	nd	nd
Fluoranthene	0.5	nd	61	nd	nd	nd
Pyrene	0.5	nd	49	nd	nd	nd
Benzo(a)anthracene	0.5	nd	26	nd	nd	nd
Chrysene	0.5	nd	20	nd	nd	nd
Benzo(b)&(k)fluoranthene	1	nd	39	nd	nd	nd
Benzo(a)pyrene	0.5	nd	22	nd	nd	nd
Indeno(1.2.3-cd)pyrene	0.5	nd	21	nd	nd	nd
Dibenz(a,h)anthracene	0.5	nd	2.6	nd	nd	nd
Benzo(g,h,i)perylene	0.5	nd	18	nd	nd	nd
Total PAHs	-	nd	355	nd	nd	nd
Surrogate % Recovery	-	108	76	91	95	98

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Less than PQL
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 7B00114

Client : Rust PPK Brisbane

Reference : 84JI53B

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plus Cover Page

Analyte	Lab No	E27843	E27870	E27873	CB	
		TP6	TP1	TP9	CONTROL	
	Sample Id	2.0-2.1	0.5-0.6	0.3-0.4	BLANK	
	PQL					
E012 Organochlorine Pesticides in Soil						
HCB	0.1	nd	nd	nd	nd	
a-BHC	0.1	nd	nd	nd	nd	
Lindane	0.1	nd	nd	nd	nd	
Heptachlor	0.1	nd	nd	nd	nd	
Aldrin	0.1	nd	nd	nd	nd	
b-BHC	0.1	nd	nd	nd	nd	
d-BHC	0.1	nd	nd	nd	nd	
Oxychlordane	0.1	nd	nd	nd	nd	
Heptachlor epoxide	0.1	nd	nd	nd	nd	
Alpha-Endosulfan	0.1	nd	nd	nd	nd	
Gamma-Chlordane	0.1	nd	nd	nd	nd	
Alpha-Chlordane	0.1	nd	nd	nd	nd	
trans-Nonachlor	0.1	nd	nd	nd	nd	
DDE	0.1	nd	nd	nd	nd	
Dieldrin	0.1	nd	nd	nd	nd	
Endrin	0.1	nd	nd	nd	nd	
DDD	0.1	nd	nd	nd	nd	
Beta-Endosulfan	0.1	nd	nd	nd	nd	
DDT	0.1	nd	nd	nd	nd	
Endosulfan sulphate	0.1	nd	nd	nd	nd	
Methoxychlor	0.1	nd	nd	nd	nd	
Total PCBs	1	nd	nd	nd	nd	
PCB Identification	-	--	--	--	--	
Surrogate % Recovery	-	83	84	79	100	

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = Less than PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified

Leachates : mg/L (ppm) in leachate

QA/QC APPENDIX NO. 7B00114

<u>Method</u>	<u>Description</u>
E084	Total Petroleum Hydrocarbons
E092	Polynuclear Aromatic Hydrocarbons
E511	pH in Soil
E340	Metals in Soils
M350S	Mercury
E504	Total Cyanide in Soil
E031	Polychlorinated Biphenyls
E083	Total Petroleum Hydrocarbons
E370	Total Metals in Water
M350W	Mercury
W031	pH
E012	Organochlorine Pesticides and PCBs
E022	Organophosphorus Pesticides
E1032	Total Phenolics as phenol

Chromatography QA/QC

	Yes	No	N/A
Retention Time Window			
Within Acceptance Criteria($\pm 2\%$)	✓		
Check Standard Within			
Acceptance Criteria($\pm 10\%$)	✓		
Recalibration Within			
Acceptance Criteria($\pm 15\%$)	✓		

Other QA/QC

Holding time conforming	
With Method Specification	✓
Chain of Custody Attached	✓

N/A=Not Applicable

Comments

1. Laboratory QA/QC including Duplicates, Matrix Spike Duplicates, and check/reference samples are included in this QA/QC appendix. (Where applicable)
2. Inter-Laboratory proficiency trial results available on request. (Where applicable)
3. Surrogate description and recoveries are recorded in the Report. (Where applicable)
4. Acceptance criteria for specific analytes as are listed on each QA/QC page.
5. Practical Quantitation Limit (PQL is typically 2-10 x method detection limit (MDL)
6. PQL's are matrix dependent and are increased accordingly where sample extracts are diluted.
7. Results are uncorrected for matrix spike or surrogate recoveries.

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

[illegible]

QAQC : Matrix Spike / Check Solution[illegible]

PQL = Practical Quantitation Limit

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm)

nd = Not Detected
-- = Not Applicable

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 4th Edition 1/7/97

QAQC : Matrix Spike / Check Solution

Analyte	Level (ppm)	Level Detected		Recovery Details			
		Result1 (ppm)	Result2 (ppm)	Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
E012 Organochlorine Pesticides in Soil							
HCB	0.5	0.5	0.5	100%	100%	100%	0%
a-BHC	0.5	0.5	0.5	100%	100%	100%	0%
Lindane	0.5	0.5	0.5	100%	100%	100%	0%
Heptachlor	0.5	0.4	0.4	80%	80%	80%	0%
Aldrin	0.5	0.5	0.5	100%	100%	100%	0%
b-BHC	0.5	0.5	0.5	100%	100%	100%	0%
d-BHC	0.5	0.5	0.5	100%	100%	100%	0%
Oxychlordane	0.5	0.5	0.5	100%	100%	100%	0%
Heptachlor epoxide	0.5	0.5	0.5	100%	100%	100%	0%
Alpha-Endosulfan	0.5	0.5	0.5	100%	100%	100%	0%
Gamma-Chlordane	0.5	0.5	0.5	100%	100%	100%	0%
Alpha-Chlordane	0.5	0.5	0.5	100%	100%	100%	0%
trans-Nonachlor	0.5	0.5	0.5	100%	100%	100%	0%
DDE	1.0	1.0	1.0	100%	100%	100%	0%
Dieldrin	0.5	0.5	0.5	100%	100%	100%	0%
Endrin	0.5	0.5	0.5	100%	100%	100%	0%
DDD	1	0.9	1.0	90%	100%	95%	11%
Beta-Endosulfan	0.5	0.6	0.6	120%	120%	120%	0%
DDT	1.0	1.0	1.0	100%	100%	100%	0%
Endosulfan sulphate	0.5	0.6	0.5	120%	100%	110%	18%
Methoxychlor	0.5	0.5	0.5	100%	100%	100%	0%
Total PCBs	-	--	--				
PCB Identification	-	--	--				
Surrogate % Recovery	-	--	--				

PQL = Practical Quantitation Limit

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm)

nd = Not Detected
-- = Not Applicable

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 4th Edition 1/7/97

QAQC : Matrix Spike / Check Solution

Analyte	Level (ppm)	Level Detected		Recovery Details			
		Result1 (ppm)	Result2 (ppm)	Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
E022 OP Pesticides in Soil							
Dichlorvos	5	5.1	4.9	102%	98%	100%	4%
Mevinphos	5	4.2	4.0	84%	80%	82%	5%
Ethoprop	5	5.0	4.8	100%	96%	98%	4%
Phorate	5	4.5	4.8	90%	96%	93%	6%
Demeton-s	5	5.3	5.1	106%	102%	104%	4%
Diazinon	5	4.2	4.5	84%	90%	87%	7%
Disulfoton	5	4.7	4.7	94%	94%	94%	0%
Ronnel	5	4.3	4.9	86%	98%	92%	13%
Chlorpyrifos methyl	5	4.4	4.6	88%	92%	90%	4%
Chlorpyrifos	5	4.7	4.7	94%	94%	94%	0%
Merphos	5	4.8	4.8	96%	96%	96%	0%
Parathion methyl	5	4.8	5.0	96%	100%	98%	4%
Fenthion	5	4.7	4.7	94%	94%	94%	0%
Malathion	5	4.5	5.0	90%	100%	95%	11%
Fenitrothion	5	4.8	4.8	96%	96%	96%	0%
Prothiophos	5	5.2	5.0	104%	100%	102%	4%
Stiophos	5	4.0	4.2	80%	84%	82%	5%
Ethion	5	4.4	4.8	88%	96%	92%	9%
Bolstar	5	4.7	4.6	94%	92%	93%	2%
Fensulfothion	5	4.4	4.8	88%	96%	92%	9%
Azinphos methyl	5	5.1	5.1	102%	102%	102%	0%
Coumaphos	5	4.9	5.8	98%	116%	107%	17%
Surrogate % Recovery		--	--				

PQL = Practical Quantitation Limit

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm)

nd = Not Detected
-- = Not Applicable

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 4th Edition 1/7/97

QAQC : Matrix Spike / Check Solution

Analyte	Level (ppm)	Level Detected		Recovery Details			
		Result1 (ppm)	Result2 (ppm)	Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
E031 Polychlorinated Biphenyls in Water							
PCB1260	0.1	0.10	0.10	100%	100%	100%	0%
E083 TPH in Water							
TPH C6-C36 as C8	9.5	11	9.7	116%	102%	109%	13%
C6-C9 Fraction	4.0	4.5	3.7	113%	93%	103%	20%
C15-C28 Fraction	5.5	6.8	6.0	124%	109%	116%	13%
Total Metals in Waters							
Arsenic	0.100	0.105	0.104	105%	104%	105%	1%
Cadmium	0.100	0.103	0.100	103%	100%	102%	3%
Chromium	0.100	0.099	0.099	99%	99%	99%	0%
Copper	0.100	0.100	0.099	100%	99%	100%	1%
Nickel	0.100	0.101	0.100	101%	100%	101%	1%
Lead	0.100	0.089	0.086	89%	86%	87%	3%
Zinc	0.100	0.10	0.10	100%	100%	100%	0%
M350 Mercury in Water	0.12	0.110	0.110	92%	92%	92%	0%
W031 pH	7.4	7.4		100%			

PQL = Practical Quantitation Limit

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm)

nd = Not Detected
-- = Not Applicable

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 4th Edition 1/7/97



INDUSTRIAL AND ENVIRONMENTAL SERVICES DIVISION
Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

Client: Rust PPK Brisbane	Our Ref: 7B00114
Your Ref: 84JI53B	Date: 08/08/97

SAMPLE DISPOSAL ADVICE

All samples remain the client's property after analysis. These will be either returned or disposed of (at the client's cost where applicable) following analysis.

Please indicate your requirements below.

1. RETURN SAMPLES TO CLIENT ☐
2. DISCARD AFTER * 6 Weeks - Soils ☐
* 4 Weeks - Waters ☐
3. DISCARD IMMEDIATELY ☐

* Storage times commence from date of issue of the final report.

RETURN TO FOLLOWING ADDRESS _____

TRANSPORT COMPANY _____

PLEASE NOTE *If this advice slip is not returned within 15 days, it will be assumed that the samples referenced above can be discarded after indicated storage times (*)*

Authorised Signature _____

Please return to
Ross Dewar
AMDEL Ltd
P.O. Box 514
HORNSBY N.S.W. 2077
or fax to (02) 9482 1734

QA/QC APPENDIX NO. 7B00114B

Method Description

T370WT Metals in Leachate by ICP-MS
T350 Mercury in Leachate

Chromatography QA/QC

	Yes	No	N/A
Retention Time Window Within Acceptance Criteria($\pm 2\%$)			✓
Check Standard Within Acceptance Criteria($\pm 10\%$)			✓
Recalibration Within Acceptance Criteria($\pm 15\%$)			✓

Other QA/QC

Holding time conforming With Method Specification	✓
Chain of Custody Attached	✓

N/A=Not Applicable

Comments

1. Laboratory QA/QC including Duplicates, Matrix Spike Duplicates, and check/reference samples are included in this QA/QC appendix. (Where applicable)
2. Inter-Laboratory proficiency trial results available on request. (Where applicable)
3. Surrogate description and recoveries are recorded in the Report. (Where applicable)
4. Acceptance criteria for specific analytes as are listed on each QA/QC page.
5. Practical Quantitation Limit (PQL is typically 2-10 x method detection limit (MDL)
6. PQL's are matrix dependent and are increased accordingly where sample extracts are diluted.
7. Results are uncorrected for matrix spike or surrogate recoveries.

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

**INDUSTRIAL AND ENVIRONMENTAL SERVICES DIVISION**Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667Correspondence to:
PO BOX 514
HORNSBY NSW 20775 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

Client: PPK Brisbane	Our Ref: 7B00114B
Your Ref: 84JI53B	Date: 26/08/97

SAMPLE DISPOSAL ADVICE

All samples remain the client's property after analysis. These will be either returned or disposed of (at the client's cost where applicable) following analysis.

Please indicate your requirements below.

1. RETURN SAMPLES TO CLIENT ☐
2. DISCARD AFTER * 6 Weeks - Soils ☐
* 4 Weeks - Waters ☐
3. DISCARD IMMEDIATELY ☐

* Storage times commence from date of issue of the final report.

RETURN TO FOLLOWING ADDRESS _____

TRANSPORT COMPANY _____

PLEASE NOTE *If this advice slip is not returned within 15 days, it will be assumed that the samples referenced above can be discarded after indicated storage times (*)*

Authorised Signature _____

Please return to

Ross Dewar
AMDEL Ltd
P.O. Box 514
HORNSBY N.S.W. 2077
or fax to (02) 9482 1734

ENVIRONMENTAL AND INDUSTRIAL SERVICES DIVISION

Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

CERTIFICATE OF ANALYSIS

Contents :

- 1) Cover Page
- 2) Amdel Mineral Chemistry Report 7B00114A

REPORT No : 7B00114A
ATTENTION : Mr Steve Robertson
CLIENT : PPK Brisbane
SAMPLES : 7
REFERENCE : 84J153B
DATE RECEIVED : 22/08/97
DATE REPORTED : 14/08/97

N.B. Sulfur analysis conducted by Amdel Laboratories Mineral Chemistry NATA registration 1526.

RESULTS

All samples were analysed as received. This report relates specifically to the samples received.
Results relate to the source material only to the extent that the samples as supplied are truly representative of the sample source. This report replaces any preliminary results issued.
Note that for schemes indicated with * NATA registration does not cover the performance of this service.

PLEASE SEE ATTACHED PAGES FOR RESULTS

sch4p4(6) Personal information

per G. W. ANDERSON
Manager Environmental Sydney

MINERAL CHEMISTRY

Amdel Laboratories Ltd
PO Box 338
Torrensville Plaza SA 5031
ACN 009 076 555

Telephone (08) 8416 5300
Facsimile (08) 8234 0321

Mr Steve Robertson
Rust PPK
348 Edward Street
BRISBANE NSW 4000

FINAL ANALYSIS REPORT

Your Order No: 843153B

Our Job Number : 7B00114A

Sample rec'd : 06/08/97

Results reported : 14/08/97

No. of samples : 7

Report comprises a cover sheet and pages 1 to 1

Approved Signature:

sch4p4(6) Personal information

for
Alan Ciplys
Manager - Mineral Chemistry

Report Codes:

N.A. - Not Available.
L.N.R. - Listed But Not Received.
I.S. - Insufficient Sample.

Distribution Codes:

CC - Carbon Copy
EM - Electronic Media
MM - Magnetic Media

Final

ANALYTICAL REPORT

	SAMPLE	S
TP6	0.9-1.0M	0.20
TP8	1.2-1.3M	<0.05
TP2	0.3-0.5M	0.40
TP5	0.9-1.0M	<0.05
TP4	0.3-0.4M	0.10
TP1	0.5-0.6M	<0.05
TP10	0.2-0.3M	0.05

RTI DL RELEASE - EHP

UNITS	%
DET.LIM	0.05
SCHEME	VOL2

Appendix J

Returned Chain of Custodies (Soil & Water)

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCBS	Other	Initials	Comments/Additional Information and/or Analysis Required
29/7/97		PCB1 ✓	E27803		(S)									
29/7/97		PCB2 ✓	04		L									
29/7/97		PCB3 ✓	05		L									
29/7/97		PCB4 ✓	06		L									
"		P1 ✓	07		S									
"		P2 ✓	08		S									
"		P3 ✓	09		S									
"		P4 ✓	10		S									
"		P5 ✓	11		S									
"		P6 ✓	12		S									
"		P7 ✓	13		S									

Relinquished by:
Date & Time:
Company:
Signature:

Received in Good Order
& Condition by (Name):
Date & Time:
Company:
Signature:

Relinquished by:
Date & Time:
Company:
Signature:

Received in Good Order
& Condition by (Name):
Date & Time:
Company:
Signature:

Relinquished by:
Date & Time:
Company:
Signature:

Received in Good Order
& Condition by (Name):
Date & Time:
Company:
Signature:

Medium*: S = Soil, W = Water, V = Vapour
Legend*: (circle the following to be tested)
Metals: Al As Be Cd Co Cr Cu Fe Hg L Mg Mn Ni Pb Se Sn V Zn
Samples on Ice ☐ Yes ☒ No

Please fax back a signed copy when samples are received at the laboratory

Job Title: **NEWFARM POWERSTATION**

laboratory Name: **AMDEL**

Address: **3/1 FOOT HAVEN MILTON**

Fax Number: **07 3349 9111**

Phone Number: **3369 5535**

Contact Name: **BILL STAVROPOULOS**

Delivery Method:

Quote Number:

Rust PPK Job Number: **343 153 B**

Job Location: **NEWFARM**

Project Manager: **CRAIG WILDERMUTH**

Results Expected by/on: **6-8-97**

Fax Results to: **Steve Robson**

Fax Number: **07 3331 4323**

Phone Number: **3369 5535**

Spreadsheet of Results Required: **Y / N**

Format:

Turnaround Time Required: **2-5 days**

Invoice to:

Comments: **GLMS Compendiums to be supplied.**

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	COCOP/PCB's	Metals**	PH	Initials	Comments/Additional Information and/or Analysis Required
1/8/97	8:10am	Turbine Room	✓ x 2	E27834	W			✓				✓	✓		sch4p4(6) Personal information
	7:30am	Sump	✓ x 2	35				✓				✓	✓		
	8:15am	Bunker	✓ x 2	36				✓				✓	✓		



Relinquished by: **sch4p4(6) Personal information**

Date & Time: **1-8-97 1:30pm**

Company: **PPK**

Signature: **sch4p4(6) Personal information**

Received in Good Order

Condition by (Name): **GARTH MORRISON**

Date & Time: **04/07/97 10AM**

Company: **AMDEL**

Signature: **sch4p4(6) Personal information**

Relinquished by:

Date & Time:

Company:

Signature:

Received in Good Order

& Condition by (Name):

Date & Time:

Company:

Signature:

Medium*: S = Soil, W = Water, V = Vapour

Legend**: (circle the following to be tested)

Metals: Al ☒ Be ☒ Co ☒ Cr ☒ Fe ☒ Hg ☒ Li ☒ Mn ☒ Ni ☒ Pb ☒ Se ☒ Sn ☒ V ☒ Zn

Samples on Ice: ☒ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory

RTI DL RELEASE - EPR

Job Title: **NEWFARM REGENERATION**

Laboratory Name: **AMDEL**

Address: **2/1 FORT LANE MILTON**

Fax Number: **3369 9111**

Phone Number: **3369 5555**

Contact Name: **DR STAUROPOLOUS**

Delivery Method:

Quote Number:

Rust PPK Job Number: **8431538**

Job Location: **NEWFARM**

Project Manager: **CRAN WILKINSON**

Results Expected by/on: **6-8-97**

Fax Results to: **STEVE COOPER**

Fax Number: **3361 4885**

Phone Number: **3318 2822**

Spreadsheet of Results Required: **Y / N**

Format:

Turnaround Time Required: **3-5 days**

Invoice to:

Comments: **GEMS Chromatograms to be sub**

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCBS	Metals**	PH	CN	Initials	Comments/Additional Information and/or Analysis Required
1/8/97		TP6; 0.3-0.4m	✓ 27837													Hold
		TP6; 0.5-0.6m	✓ 38													
		TP6; 0.8-0.9m	✓ 89													
		TP6; 0.9-1.0m	✓ 40													
		TP6; 1.0-1.2m	✓ 41													
		TP6; 1.3-1.4m	✓ 42													
		TP6; 2.0-2.1	✓ 43													
		TP6; 4.0-4.1	✓ 44													Hold
		TP7; 0.2-0.3m	✓ 45													
		TP7; 0.8-0.9m	✓ 46													
		TP7; 1.9-2.0m	✓ 47													Hold

Relinquished by: **sch4p4(6) Personal information**

Date & Time: **11/8/97 2:00pm**

Company: **PPK**

Signature: **sch4p4(6) Personal information**

Received in Good Order

Condition by (Name): **GARTH MORRISON**

Date & Time: **04/07/97 10am**

Company: **AMDEL LABS**

Signature: **sch4p4(6) Personal information**

Relinquished by:

Date & Time:

Company:

Signature:

Received in Good Order & Condition by (Name):

Date & Time:

Company:

Signature:

Medium*: S = Soil, W = Water, V = Vapour

Legend**: (circle the following to be tested)

Metals: Al ☒ As ☒ Be ☒ Co ☒ Cr ☒ Fe ☒ Hg ☒

Li ☒ Mg ☒ Mn ☒ Ni ☒ Pb ☒ Se ☒ Sn ☒ V ☒ Zn ☒

Samples on Ice: ☒ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory



RTI DL RELEASE - EPR

Please fax back a signed copy when samples are received at the laboratory

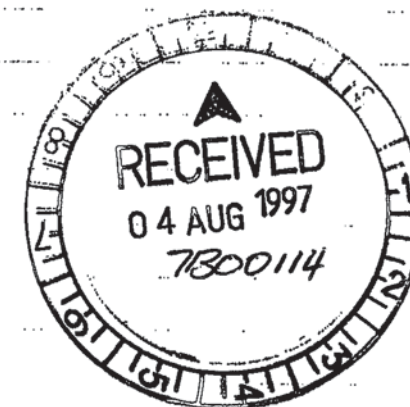
A circular black and white stamp. The word "RECEIVED" is prominently displayed in the center. Below it, the date "04 AUG 1971" is stamped. At the bottom of the circle, the number "7800114" is visible. The outer ring of the stamp contains numbers from 1 to 12, likely representing hours.

Initials	Comments/Additional Information and/or Analysis Required
----------	--

Quote Number:

Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCB's	Metals**
							PY
							CN

sch4p4(6) Personal information



Medium*: S = Soil, W = Water, V = Vapour

Legend**: (circle the following to be tested)

Metals: Al  Be  Co   Fe 

Li Mg Mn **Ni** **Pb** Se Sn V **Zn**

Samples on Ice: ☒ Yes ☐ No

Please fax a signed copy when samples are received at the laboratory

Signature: sch4p4(6) Personal information

Signature: _____

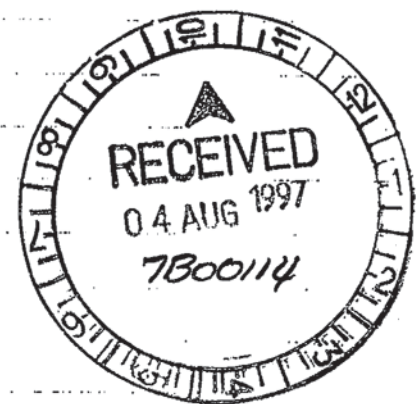
Signature: _____

Job Title: **New Farm**
Laboratory Name: **AMDEL**
Address: **MILTON**
Fax Number:
Phone Number:
Contact Name: **DILL STANHOPE**
Delivery Method:
Quote Number:
Rust PPK Job Number: **8451580**
Job Location:
Project Manager: **C. Wible**
Results Expected by/on: **6-8-97**
Fax Results to: **S. Robertson**
Fax Number: **5831 4982**
Phone Number: **5218 2882**
Spreadsheet of Results Required: **Y / N**
Format:
Turnaround Time Required: **3-5 days**
Invoice to:
Comments: **GCMS Monitoring**

Fax Number:					Medium *	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCBs	Metals**	Spreadsheet of Results Required: Y / N		
Phone Number:													Format:		
Contact Name: Bill Staurovoulos													Turnaround Time Required: 3-5 days		
Delivery Method:													Invoice to:		
Quote Number:					Comments: GCMS Unsaturation		Initials		Comments/Additional Information and/or Analysis Required						
Date Sampled	Time	Sample I.D.	Container Size	Sample Location											
21/7/97		TP3: 1.35m-1.4m	✓ 67		S		✓		✓		✓	✓	sch4p4(6) Personal information	} Hold	
		TP3: 1.45-1.5m	✓ 68												
		TP3: 2.2-2.5m	✓ 69												
		TP1: 0.5-0.6m	✓ 70												
		TP1: 1.4-1.6m	✓ 71												
		TP1: 2.2-2.5m	✓ 72												
		TP9: 0.3-0.4m	✓ 73												
		TP1: 0.3-0.5m	✓ 74												
		TP1: 1.4-1.5m	✓ 75												
		TP9: 2.1-2.3m	✓ 76					✓		✓		✓			✓

RTI DL RELEASE - EXPT

RECEIVED
04 AUG 1997
7B00114



Relinquished by: sch4p4 (6) Personal information
Date & Time: **2:00 1-8-97**
Company: **PPL**
Signature: sch4p4 (6) Personal information
Received in Good Order & Condition by (Name): **GARTH MORRISON**
Date & Time: **04/08/97 10am**
Company: **AMDEL LABS**
Signature: sch4p4 (6) Personal information
Relinquished by:
Date & Time:
Company:
Signature:
Received in Good Order & Condition by (Name):
Date & Time:
Company:
Signature:
Medium*: **(S)** Soil, W = Water, V = Vapour
Legend**: (circle the following to be tested)
Metals: Al **(As)** Be **(Ca)** Co **(Cr)** Cu **(Fe)** **(Hg)**
Li Mg Mn **(Ni)** **(Pb)** Se Sn V **(Zn)**
Samples on Ice: ☒ Yes ☐ No
Please fax back a signed copy when samples are received at the laboratory

Appendix K

Summary of Analytical Results and Statistical Analysis

Brisbane City Council - New Farm ESA Summary of Soil Analytical Results

Sample	Depth (m)	C6-C9	C10-C14	C15-C28	C29-C36	As	Cd	Cr	Cu	Ni	Pb	Zn	Hg	Cn	Phenols
TPH and Metals															
Limit of reporting		10	20	100	100	5	1	5	5	5	5	5	0.05	0.1	0.1
TP6	0.9-1.0	10	20	100	100	5	1	5	13	5	7	18	0.05	0.2	0.1
TP6	2.0-2.1	10	20	100	100	5	1	7	5	5	21	12	0.05		
TP7	0.2-0.3	10	20	100	100	5	1	5	11	5	40	24	0.58	0.2	0.1
TP7	1.9-2.0	10	20	480	105	5	1	9	59	11	105	131	0.48		
TP8	1.2-1.3	10	20	100	100	5	1	8	72	12	177	164	0.33		
TP8	1.9-2.0	10	20	105	100	9	1	8	110	15	2340	376	0.12		
TP2	0.3-0.5	10	20	100	100	124	1	14	131	42	818	1840	3.9		
TP2	2.3-2.4	10	20	100	100	5	1	28	15	23	8	42	0.05		0.1
TP5	0.9-1.0	10	20	100	100	5	1	20	14	17	30	59	0.09		
TP5	3.5-3.6	10	20	100	100	5	1	13	18	14	48	56	0.26		
TP4	0.3-0.4	10	20	100	100	5	1	21	20	17	40	69	0.14	0.2	
TP4	2.8-2.9	10	20	720	100	5	1	21	20	17	57	880	0.12		0.8
TP3	1.0-1.2	10	20	100	100	5	1	5	6	6	12	15	0.05	0.2	0.1
TP3	1.35-1.4	10	20	100	100	5	1	5	5	5	26	39	0.07		
TP1	0.5-0.6	10	20	100	100	5	1	24	15	19	8	49	0.06		
TP1	2.2-2.5	10	20	100	100	5	1	26	18	33	9	61	0.05		0.1
TP9	0.3-0.4	10	20	100	100	10	1	15	22	13	29	72	0.08		
TP9	2.1-2.3	10	20	100	100	5	1	23	19	23	16	148	0.07		
TP10	0.2-0.3	10	20	100	100	5	1	7	32	10	106	124	0.28		
TP10	1.8-1.9	10	20	100	100	5	1	5	27	7	127	120	0.13		
Coal Drain	Surface	10	20	100	100	7	52	16	282	13	5140	3360	2.1		
Turb 1 East	Surface	10	20	570	100	30	11	57	1140	88	23700	23600	291		
Turb 2 West	Surface	10	20	705	100	17	8	48	528	52	24600	28300	27		

Brisbane City Council - New Farm ESA Summary of Soil Analytical Results

Sample	Depth (m)	C6-C9	C10-C14	C15-C28	C29-C36	As	Cd	Cr	Cu	Ni	Pb	Zn	Hg	Cn	Phenols
	Total	23	23	23	23	23	23	23	23	23	23	23	23	4	6
	Mean	10.00	20.00	190.43	100.22	12.26	3.96	16.96	112.26	19.65	2498.43	2589.52	14.22	0.20	0.22
	Stdev	0.00	0.00	205.34	1.04	25.01	10.76	13.59	253.26	19.08	6927.96	7444.75	60.60	0.00	0.29
	Max	10.00	20.00	720.00	105.00	124.00	52.00	57.00	1140.00	88.00	24600.00	28300.00	291.00	0.20	0.80
	Min	10.00	20.00	100.00	100.00	5.00	1.00	5.00	5.00	5.00	7.00	12.00	0.05	0.20	0.10
	95% UCL	10.00	20.00	276.07	100.65	22.69	8.45	22.63	217.88	27.61	5387.59	5694.20	39.49	0.20	0.45
Assumes maximum value for results stated to be <20, <50, <100, <100															
Sample															
OCPs and OPPs		OCPs	OPPs												
Limit of reporting		0.1	0.5												
TP6	2.0-2.1	0.1	0.5												
TP1	0.5-0.6	0.1	0.5												
TP9	0.3-0.4	0.1	0.5												
Total		3	3												
Mean		0.10	0.50												
Stdev		0.00	0.00												
Max		0.10	0.50												
Min		0.10	0.50												
95% UCL		0.10	0.50												
All values in mg/kg unless otherwise specified															

Brisbane City Council - New Farm ESA Summary of Soil Analytical Results

Sample	Depth (m)	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)&(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene
PAHs															
Limit of reporting		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP6	0.9-1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP6	2.0-2.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP7	0.2-0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
87 6.6 87 TP7	1.9-2.0	0.5	1	0.5	0.5	1.1	1.2	8.6	10	6.5	5.3	20	9.7	12	1.7
TP8	1.2-1.3	0.5	0.5	0.5	0.5	0.5	0.5	1	0.6	0.5	0.5	1	0.7	0.8	0.5
87 TP8	1.9-2.0	0.5	0.5	0.5	0.5	0.6	0.5	1.3	1.4	0.7	0.7	2	0.8	0.8	0.5
TP2	0.3-0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP2	2.3-2.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP5	0.9-1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
15 TP5	3.5-3.6	0.5	0.5	0.5	0.5	0.5	0.5	2.5	2.6	1.4	1.2	3	1.5	1.4	0.5
TP4	0.3-0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
355 TP4	2.8-2.9	3.9	0.8	6.6	9	65	13	61	49	26	20	39	22	21	2.6
TP3	1.0-1.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP3	1.35-1.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP1	0.5-0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP1	2.2-2.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP9	0.3-0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
6 5.5 89 TP9	2.1-2.3	0.5	0.5	0.5	0.5	0.5	0.5	0.9	1	0.7	0.7	3	1.3	1.7	0.5
TP10	0.2-0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.5	0.5	1	0.7	0.7	0.5
TP10	1.8-1.9	0.5	0.5	0.5	0.5	0.5	0.5	1	1.1	0.7	0.7	2	1	1.3	0.5
Coal Drain	Surface	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
Turb 1 East	Surface	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
Turb 2 West	Surface	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
Total		23	23	23	23	23	23	23	23	23	23	23	23	23	23

Brisbane City Council - New Farm ESA Summary of Soil Analytical Results

Mean	0.65	0.53	0.77	0.87	3.33	1.07	3.68	3.23	1.94	1.61	3.74	1.97	2.05	0.64
Stdev	0.71	0.12	1.27	1.77	13.44	2.60	12.61	10.17	5.39	4.13	8.64	4.77	4.77	0.49
Max	3.90	1.00	6.60	9.00	65.00	13.00	61.00	49.00	26.00	20.00	39.00	22.00	21.00	2.60
Min	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	1.00	0.50	0.50	0.50
95% UCL	9.43E-01	5.84E-01	1.30E+00	1.61E+00	8.94E+00	2.16E+00	8.94E+00	7.48E+00	4.19E+00	3.34E+00	7.34E+00	3.95E+00	4.04E+00	8.50E-01
All values in mg/kg unless otherwise specified														

RTI DL RELEASE - EHP

Brisbane City Council - New Farm ESA Summary of Soil Analytical Results

Benzo(g,h,i)perylene	Total PAHs
0.5	
0.5	
0.5	
0.5	
9.9	87
0.6	6.6
0.8	8.7
0.5	-
0.5	
0.5	
1.2	15
0.5	
18	355
0.5	
0.5	
0.5	
0.5	
0.5	
1.5	10
0.6	5.5
1.2	8.9
0.5	-
0.5	-
0.5	-
	-
23	8

RTI DL RELEASE - EHP

Brisbane City Council - New Farm ESA Summary of Soil Analytical Results

1.80	62.09
4.03	121.48
18.00	355.00
0.50	5.50
3.48E+00	1.48E+02

RTI DL RELEASE - EHP

Brisbane City Council - New Farm ESA Summary of Water Analytical Results

Sample	C ₆ -C ₉	C ₁₀ -C ₁₄	C ₁₅ -C ₂₈	C ₂₉ -C ₃₆	As	Cd	Cr	Cu	Ni	Pb	Zn	Hg
TPH and Metals												
Limit of rep	0.02	0.04	0.2	0.2	0.002	0.001	0.005	0.005	0.005	0.005	0.01	0.001
Turbine Roo	0.02	0.1	36	0.2	0.002	0.001	0.005	0.008	0.005	0.102	0.94	0.001
Sump	0.02	2.2	3000	34	0.004	0.001	0.005	0.005	0.005	0.005	0.03	0.001
Bunker	0.02	0.26	6.4	1	0.03	0.003	0.018	0.835	0.034	1.2	1.3	0.013
Total	3	3	3	3	3	3	3	3	3	3	3	3
Mean	0.02	0.85	1014.13	11.73	0.01	0.00	0.01	0.28	0.01	0.44	0.76	0.01
Std Deviatio	0.00	1.17	1719.87	19.29	0.02	0.00	0.01	0.48	0.02	0.66	0.65	0.01
Max	0.02	2.20	3000.00	34.00	0.03	0.00	0.02	0.84	0.03	1.20	1.30	0.01
Min	0.02	0.10	6.40	0.20	0.00	0.00	0.01	0.01	0.01	0.01	0.03	0.00
95% UCL	0.02	2.20	3000.07	34.00	0.03	0.00	0.02	0.84	0.03	1.20	1.51	0.01
All values in mg/L unless otherwise specified												

RTI DL RELEASE - EHP