Environmental Investigations
Contamination Assessment
Management & Geotechnical

COMSERV NO 462 PTY LTD

STAGE 2 ENVIRONMENTAL SITE ASSESSMENT

84-86 KIORA ROAD,
MIRANDA, NSW

Environmental Investigations
Report No. E1427.1 AA

17th November, 2011

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STAGE 2 ENVIRONMENTAL SITE ASSESSMENT
84-86 Kiora Road, Miranda, NSW

EI Report No. *E1481.1 AA*
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	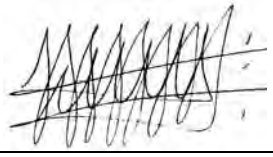
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1.0 INTRODUCTION

Environmental Investigations (EI) was engaged by Mr John Dimopoulus on behalf of COMSERV No 462 Pty Ltd to conduct a Stage 2 Environmental Site Assessment (ESA2) for a property located at 84-86 Kiora Road, Miranda, NSW (henceforth referred to as 'the site'), within the local government authority of Sutherland Shire Council, as shown in the site locality plan, Figure 1.

The site is also identified as Lot C in DP 415413 and situated within the local government authority of Sutherland Shire Council, Parish of Sutherland and the County of Cumberland (Ref. Figure 1).

At the time of this investigation the site was occupied by a two storey rendered and brick building with tile and metal roof and an adjacent asphalt paved car park located towards the rear.

This report includes a review of a Stage 1 Contamination Assessment report prepared by EI (Ref. Aargus Report No. E1351.1 AD, dated 25th April, 2011) titled *"Preliminary Environmental Site Assessment, 84-86 Kiora Road, Miranda, NSW"*. The purpose of this ESA2 was to evaluate the potential for site contamination resulting from previous land uses, as part of a development application for a dental hospital as required by the NSW Department of Planning. It is understood that the proposed development include the demolition of existing structures and erection of a 6 to 7 levels building with fully automated parking system (approx. 10m below street level) to providing off-street car parking below ground.

This report documents the findings of all additional investigations conducted by EI, including a desk study involving reviews of site history and relevant soil and hydrogeological maps, field-based soil investigations, results of laboratory analyses and a discussion of the potential areas of environmental concern.

The work reported herein follows standard environmental procedures and was conducted with the following references:

- ANZECC/ARMCANZ (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, Australian and New Zealand Environment and Conservation Council / Agriculture & Resource Management Council of Australia & New Zealand;

- DEC (2007) *Guidelines for the Assessment and Management of Groundwater Contamination*, NSW Dept. Environment & Conservation (DEC);

- DEC (2006) *Guidelines for the NSW Site Auditor Scheme (2nd Edition)*, NSW DEC;

- EPA (1997) *Guidelines for Consultants Reporting on Contaminated Sites*, NSW Environmental Protection Authority (NSW EPA);

- EPA (1995) *Sampling Design Guidelines*, NSW EPA;

- EPA (1994) *Guidelines for Assessing Service Station Sites*, NSW EPA; and

- NEPC (1999) National Environment Protection (Assessment of Site Contamination) Measure 1999, National Environment Protection Council.

2.0 OBJECTIVES AND SCOPE OF WORK

The main objective of this ESA2 was to appraise the degree of site contamination (if any) and to assess the site's suitability for the proposed development. It was therefore proposed to conduct an investigation that follows standard environmental procedures following the Australian and New Zealand Guidelines for the Assessment of Contaminated Sites (ANZECC/NHMRC 2000) and the DEC Guidelines for the NSW Site Auditor Scheme (2006).

In order to achieve the above objective, and in keeping the project cost-effective and defensible for Council requirements, the following scope of works is proposed:

- a review of the previous Stage 1 Environmental Site Assessment (ESA1) conducted in April, 2011;
- A detailed site walkover inspection;
- A review of underground service plans;
- the construction of test boreholes at five locations distributed at targeted locations across the site;
- multiple level soil sampling down to natural soils;
- laboratory analysis of soil samples for relevant analytical parameters as determined from the site history survey and field observations during the investigation program; and
- data interpretation and reporting.

3.0 PREVIOUS INVESTIGATIONS

Preliminary Environmental Site Assessment

A previous Stage 1 Contamination Assessment of the site was conducted by EI in April, 2011, the findings of which were documented in a report titled *"Stage 1 Environmental Site Assessment, 84-86 Kiora Road, Miranda, NSW"*. The work carried out by EI provided the context for the assessment carried out as well as historical background and description of the site in relation to its previous operations.

The scope of work undertaken during this assessment can be summarised as a detailed assessment of historical site use which included review of historical aerial photographs, review of regional geology and hydrogeology conditions, review of past and current titles review of hazardous chemicals and regulatory compliance and a summary of findings during the site walkover inspection.

The site history indicates that the site was used for residential purposes up to 1946, after which further commercial activities were established.

Under the conclusions and recommendation section, EI's have identified a number of potential areas of environmental concern (AEC). Most were identified to be of minimal (low) environmental concern, however some identified areas were considered to be medium level AEC. These areas incorporate the rear of the site currently used as carpark with filling materials of unknown origin used for site levelling, buildings incorporating asbestos and lead paint-containing materials and filling materials of unknown origin, which may have been used underneath existing building as well as the areas where previous retail commercial activities were taking place.

Based on the preliminary investigation, EI concluded that due to the implied uncertainties it is recommended that a Stage Environmental Site Assessment (ESA2) be undertaken in order to establish if contamination has occurred from the identified AECs.

4.0 SITE DESCRIPTION

4.1 PROPERTY IDENTIFICATION, PHYSICAL SETTING AND LOCAL LAND USE

With the street address of 84-86 Kiora Street, Miranda, NSW the site is further identified as Lot C in DP415413. The lot falls within the local government authority of Sutherland Shire Council, Parish of Sutherland and the County of Cumberland.

According to the Sutherland Shire Local Environmental Plan (LEP) 2006, the site zoning is *Zone 8 - Urban Centre.*
At the time of this investigation the site was found to be occupied by a two storey rendered and brick building with tile and metal roof covering approximately 50% of the site footprint with the remaining area being used by an adjacent bitumen paved car park located towards the rear.

The site is a rectangular shaped block of land with an approximate area of 490.5m^2. It is situated on the south eastern corner of Kiora Road & Urunga Parade with Urunga Lane delineating the eastern site boundary (*Ref*. Figure 1). It was marked to the south by an old two storey brick commercial/residential building with a gravelly sand paved rear yard, to the west (across Kiora Road) and to the north (across Urunga Parade) by a four storey concrete panels & glass curtain walls (Westfield Shopping Center - Miranda) and to the east by a two storey pebble-crete & brick commercial building.

Reference to the *Port Hacking 1:25,000 Topographic and Orthophoto Map* (9129-3S, 3RD Edition, NSW Land Information Centre, 2002) indicates that the site lies at an elevation of about 40m above Australian Height Datum (AHD), which was found to be consistent with the client's site survey plan provided.

The site is situated in undulating terrain, sloping down to the south-east, approximately 4%. The nearest surface water feature is Gymea Bay, located approximately 1.5km south of the site. Gymea Bay drains into Port Hacking and ultimately into Tasman Sea.

4.2 REGIONAL GEOLOGY AND HYDROGEOLOGICAL CONDITIONS

Information on regional sub-surface conditions, referenced from the Department of Mineral Resources geological map *Wollongong – Port Hacking 1:100,000 Geological Series Sheet 9029-9129* (DMR, 1985), indicated that the site overlies Hawkesbury Sandstone of the Wianamatta Group (*Rh*). Hawkesbury Sandstone is characterised by medium to coarse-grained quartz sandstone, very minor shale and laminite lenses.

Fractured bedrock also forms the aquifer system for the region, giving rise to deeper groundwater conditions, which are expected to be greater than 5m Below Ground Level (BGL). Bedrock materials are known to be overlain by natural, residual, firm clay soils, which due to characteristically low hydraulic conductivities, typically restrict downward infiltration into the deeper groundwater system.

The Soil Conservation Service of NSW *Soil Landscapes of the Wollongong – Port Hacking 1:100,000 Sheet* (Hazelton, P.A., Bunnerman, S.M., and Tallie P.J. 1990), indicated that the site overlies an *Erosional Landscape - Gymea* (*gy*). According to Chapman and Murphy, this landscape type includes undulating to rolling rises and low hills on Hawkesbury Sandstone. Land use is mostly urban residential.

Local relief is 20-80m with slopes of 10-25%. Broad convex crests, moderately inclined side slopes with wide benches, localised rock outcrop on low broken scarps, extensively cleared open-forest (dry sclerophyll forest) and eucalypt woodland are further features of this landscape.

Soils are identified as shallow to moderately deep (30-100cm), yellow earths and earthy sands on crests and inside benches; shallow (<20cm) siliceous sands on leading edges of benches; localised gleyed podzolic soils and yellow podzolic soils on shale lenses; shallow to moderately deep (<100cm) siliceous sands and leached sands along drainage lines.

Limitations of this landscape are localised steep slopes, high soil erosion hazard, rock outcrop, shallow highly permeable soil and very low soil fertility.

With an approximate slope at the site of 1:25 falling to the south-east, runoff from the site is expected to follow the local surface topography and flow from the higher areas close to the Urunga Lane at the eastern parts of the site to Kiora Road.

4.3 LOCAL GROUNDWATER USAGE

An online search was conducted by EI during the Stage 1 Environmental Site Assessment in April, 2011 using the NSW Natural Resource Atlas (NRAtlas), which revealed 6 registered groundwater bores within a 2 km radius of the site.

While none of these bores were registered as being used for domestic or industrial water supply purposes; 4 bores were recorded as groundwater monitoring bores, 1 as test bores and 1 as waste disposal. Groundwater salinity of 2,047 (units were not provided), was noted within one of the registered bores (Bore Nos. GW108344) located approximately 500m of the Gymea Bay, indicating potential for brackish water.

Despite of the bore density in the local area, most of the bores were designated for monitoring purposes, which may indicate that regional groundwater quality is too saline for water supply purposes. Furthermore, no evidence was found in the database to indicate that groundwater is being used for drinking/industrial purposes in this area as well as no additional information related to the registered bore used for waste disposal purposes.

5.0 SITE CONTAMINATION APPRAISAL

5.1 SITE WALKOVER INSPECTION

Mr Anthony Barkway (EI, Site Engineer) made the following observations during an inspection of the site on 8th of November, 2011:

1. The site and surrounding land use was still consistent with the previous investigation conducted by EI with the existing building found to be tenanted by the same previous tenants.

2. Based on a brief inspection the concrete slab underlying the existing building it appears to be in reasonably good condition with minor cracks and signs of erosion, however the asphalt paved area at the rear was still found to be in poor condition with some potholes.

3. During inspection of the existing building it was also noted that some sections of the existing ceiling of the upper floor level as well as the external awing partially covering the footpath along Kiora Road and Urunga Parade were made of fibro cement sheeting (FCS), which was likely to contain asbestos. Furthermore, flaking paint found on the old windows on the upper level, giving its age, may also be associated with lead related pigments.

5.2 AREAS AND CONTAMINANTS OF ENVIRONMENTAL CONCERN

Based on a review of site operational history, EI described a number of potential Areas of Environmental Concern (AEC) and Contaminants of Potential Concern (COPC) in their Stage 1 Environmental Site Assessment, dated April 2011. The relevant findings of that exposure.

Table1. Summary of Potential Areas and Chemicals of Environmental Concern

Potential AECs	***Potentially contaminating activity***	***Contaminants of Concern***
Rear of the site currently used as carpark with filling materials of unknown origin, used for site levelling	Leakage or ground surface spillage.	Total Petroleum Hydrocarbons (TPHs), Heavy Metals, Monocyclic Aromatics (BTEX), Polycyclic Aromatic Hydrocarbons (PAHs) and Phenolic compounds
Buildings incorporating asbestos and lead paint-containing materials	Mobilization of asbestos fibres during building maintenance or demolition	Respirable Asbestos fibres, lead paint
Filling materials of unknown origin, which may have been used underneath existing building	Potentially contaminated filling previously imported onto the site	Heavy Metals, TPH, BTEX, PAHs, Polychlorinated Biphenyls (PCBs), Organochlorine Pesticides (OCPs); organophosphate pesticides (OPPs) and asbestos

5.2.1 Potential Chemicals of Concern

Soil sampling and associated laboratory analytical testing were therefore deemed necessary for the following parameters of concern:

- heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc);
- total petroleum hydrocarbons (TPHs);
- the monocyclic aromatic hydrocarbons *benzene*, *toluene*, *ethyl-benzene* and *xylenes* (BTEX);
- polycyclic aromatic hydrocarbons (PAHs);
- organochlorine pesticides (OCPs);
- polychlorinated biphenyls (PCBs);
- organophosphate pesticides (OPPs);
- phenolic compounds; and
- asbestos.

This list includes standard parameters recommended under the EPA (1994*) Table 1 Minimum Soil Sampling Protocol* for imported fill, as well as the DUAP / EPA (1998) *Appendix A Industries and Chemicals Used*.

6.0 SAMPLING, ANALYTICAL AND QUALITY PLAN

6.1 DATA QUALITY OBJECTIVES (DQO)

In accordance with the environmental standards required under the DEC (2006) *Guidelines for the NSW Site Auditor Scheme*, the process of developing Data Quality Objectives (DQO) was used by the EI assessment team to determine the appropriate level of data quality needed for the specific data requirements of the project. The DQO process that was applied for this assessment is documented in Section 6.2.

6.2 THE DQO PROCESS

Step 1 - Statement of the Problem

It is understood that COMSERV No 462 Pty Ltd is proposing to re-develop the site including the demolition of existing structures and erection of a 6 to 7 levels building with fully automated parking system (approx. 10m below street level) to providing off-street car parking below ground (*Ref.* Appendix A).

As laterally the fill/soils layer are underlain by clays, which are known to exist in the area, in this assessment it was considered to indicate that the spreading of surface leaked or spilled contaminants would be physically restricted to the location of a potential contamination incident.

The EI team members for the project were as follows:

- Damien Hart – Senior Earth Scientist (Driller and Field Work Supervisor)
- Eric Gerges – Project Manager (Decision Maker)
- Vagner Jorden – Principal Environmental Engineer (QC & Technical Review)

In completing this environmental assessment the EI team had access to the following resources: information to relevant government authorities and associated databases, Sydney-based drilling contractor firm and various Sydney-based environmental laboratories.

Step 2 – Decision Identification

Historical information indicated that the site was subject to contamination associated with the activities across the site including potential imported filling and commercial use. The concentration ranges for each identified, potential chemical of concern (COC) in soil could not be quantified prior to EI's Field Investigation, since at the time of this assessment EI was not made aware of any previous field investigations conducted on the site.

To assess the environmental condition of the site for the proposed commercial use, the EI team would make the following decisions:

- Is site soil quality suitable for the intended land use?
- Are contaminants from previous site operations potentially migrating across the site boundary?
- Do site soils require remediation or treatment and special management before the site can be used for the intended purposes, or to prevent ongoing, off-site migration of contaminants?

Step 3 – Inputs to Decision

It was decided that the investigation would involve soil sampling from six test bores, distributed across the entire site using a mixed judgemental / systematic, triangular sampling pattern, with allowance for structural obstacles (e.g. building walls, underground and overhanging services and other physical obstructions in use by existing operating businesses) and located at or down-gradient of the potential sources of contamination, which were the previously identified AECs. This approach was consistent with a judgemental sampling pattern for site characterisation as described in the NSW EPA (1995) *Sampling Design Guidelines*.

Based on the findings relating to operational site history, it was decided to incorporate the following analyses into the analytical plan for the assessment:

- analysis of discrete fill/soil samples from various depth intervals for Heavy Metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn), TPHs, BTEX, PAHs, OCPs, OPPs, PCBs and asbestos;

The Soil Investigation Levels (SILs) that would be used as the action levels for the assessment were the DEC 2006 *Column 4 Health-Based Investigation Levels for NEHF-F Health-Based Soil*

Investigation Levels for Commercial or Industrial Settings and the EPA (1994) *Threshold Concentrations for Sensitive Land Use - Soils* which are summarised in Table 2. Analytical methods have been selected to be relevant for the selected SILs with respect to contaminant detection limits and these are presented in detail in Appendix B, Table QC3.

Step 4 - Definition of Study Boundaries

The geographical boundary of the assessment was the site boundary, as illustrated in Figure 2. From a temporal perspective, it was considered that the findings of this assessment will hold true for as long as the site land use and surrounding sites remains passive in nature with minimal access to soils and no sources/inputs of contamination.

Step 5 - Decision Rule

The data acceptance criteria for Field Quality Control and Laboratory Quality Control samples tested for the identified chemicals of concern are detailed in Appendix B, Table QC5. For the purposes of this assessment the investigation team have attempted to ensure that action levels for all tested parameters exceed the measured detection limits.

The site investigation team was interested in the 95% Upper Confidence Level average for each COC tested positive in the soil samples collected from the same stratum (or sampling depth). The Action Level for each COC will be the respective SIL value as detailed in Table 2.

It should be noted that Table 2 presents a comprehensive list of contaminants, for which regulatory criteria have been previously published. Only a sub-set of these parameters were tested under this assessment.

The decision rules for the investigation were:

Soils – If the concentration for all tested investigation samples from the same sampling depth is below the SILs for the respective COC, then the site soils will be defined as unaffected with respect to that contaminant. If, however, the SIL value is exceeded, then additional investigation works will be required, to delineate the lateral and vertical extent of the contamination and/or remediation works will be required to remove affected soils from the site.

Table 2. Summary of Site Assessment Criteria for Soil Investigation Levels (SIL)

Parameter	Unit	PQL	SILs

Heavy Metals			
Arsenic - As	mg / kg	1	500
Cadmium - Cd	mg / kg	1	100
Chromium - Cr	mg / kg	1	500
Copper - Cu	mg / kg	1	5,000
Lead - Pb	mg / kg	1	1,500
Mercury - Hg	mg / kg	1	75
Nickel - Ni	mg / kg	1	3,500
Zinc - Zn	mg / kg	1	35,000
Total Petroleum Hydrocarbons (TPHs)			
C_6-C_9 fraction	mg / kg	25	65 [1]
C_{10}-C_{14} fraction	mg / kg	50	Total 1000 [1]
C_{15}-C_{28} fraction	mg / kg	100	
C_{29}-C_{36} fraction	mg / kg	100	
Monocyclic Aromatic Hydrocarbons (BTEX)			
Benzene	mg / kg	1	1 [1]
Toluene	mg / kg	1	1.4 [1]
Ethylbenzene	mg / kg	1	3.1 [1]
Xylenes (total)	mg / kg	2	14 [1]
Polycyclic Aromatic Hydrocarbons (PAHs)			
PAHs (total)	mg / kg	0.05-0.2	100
Benzo(a)Pyrene	mg /kg	0.05	5
Organochlorine Pesticides (OCPs)			
Aldrin + Dieldrin	mg / kg	0.1	50
Chlordane	mg / kg	0.1	250
DDT + DDD + DDE	mg / kg	0.1	1,000
Heptachlor	mg / kg	0.1	50
Other Organic Contaminants			
Total PCBs	mg / kg	0.1	50

SIL = Soil Investigation Levels
SILs are DEC 2006 *Column 4 Health-Based Investigation Levels for NEHF-F Health-Based Soil Investigation Levels for Commercial or Industrial seetings*, unless otherwise indicated.
[1] = EPA (1994) *Threshold Concentrations for Sensitive Land Use - Soils.*

Step 6 - Specification of Acceptable Limits on Decision Errors

Determination of possible concentration ranges:

As there were no previous field investigations conducted on the site, mean concentration levels for the identified COCs could not be estimated.

Identifying the Decision Errors:

Soil – Considering that future site redevelopment will involve demolition of existing structures and re-developed as multi-storey commercial building with underground car-parking facility and no landscaped areas having accessible soils, the planning team has determined that the two decision errors for each respective COC are:

a) deciding that site soils exceed the SILs when they truly do not; and
b) deciding that site soils are within the SILs when they truly are not.

Evaluating the potential consequences of each decision error:

Soil – The consequences of deciding that the soils exceed the SILs when they truly do not, will be that additional soil investigations will need to be carried out and/or remediation of affected site soils, which will add cost and time delays to the project.

The consequences of deciding that the soils do not exceed the SILs when they truly do, will be that contaminated soils will be left unmanaged, on the site and potentially endanger human health or pose ongoing risks to the environment. In addition, the future owners of the site may be liable for future damages and environmental cleanup costs.

Evaluating Severity of Decision Error Consequences:

The planning team concluded that:

Soil – The consequences of deciding that the soils do not exceed the SILs when they truly do, would be more severe near the action level since the risk of jeopardising human health and the

environment outweigh the consequences of having to pay more for further investigation and/or remediation of affected soils.

Definition of the Null Hypothesis:

Soil – For soils remaining on the site and for each respective COC, the baseline condition or null hypothesis (H_o) is "the soils exceed the SILs". The alternative hypothesis (H_a) is "the soils are within the SILs".

The *false positive* decision error occurs when the null hypothesis is rejected when it is true. For soils to remain on the site, the *false positive* decision error occurs when the decision maker decides the soil is within the SILs for the respective COC when it truly exceeds the SILs.

The *false negative* decision error occurs when the null hypothesis is not rejected when it is false. For soils remaining on the site, the *false negative* decision error occurs when the decision maker decides the soil exceeds the SILs for the respective COC when it truly is within the SILs.

Decision Error Limits:

Soil – Errors that increase the probability of not carrying out additional soil investigations and/or remediation of affected soils when that action is truly required (i.e. false positive decision errors) will be considered acceptable 10% of the time for each respective COC. Errors that increase the probability of carrying out additional soil investigations and/or remediation of affected soils when that action is not required (i.e. false negative decision errors) will be considered acceptable 10% of the time for each respective COC.

Step 7 – Optimised Design for Data Collection

Soil sampling procedures that would be implemented to optimise data collection for achieving the DQOs included the following:

- Sampling from a systematic, triangular sampling grid; and

- Stratified sampling from selected depth intervals to characterise fill soils, separately to natural soils.

6.3 DATA QUALITY INDICATORS

6.3.1 Completeness

Data completeness is defined as the percentage of measurements made, which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study. If there is an insufficient amount of valid data, as determined by the other data quality objectives, then additional data would be required to be collected.

6.3.2 Data Comparability

Data comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples, ensuring analysing laboratories use consistent analysis techniques and reporting methods. Reporting of results was done in consistent units and nomenclatures, and comparability was achieved by ensuring that precision and accuracy objectives were met.

6.3.3 Data Representativeness

Data representativeness expresses the degree which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Representativeness was achieved by collecting samples at pre-determined locations across the site (dependent on subsurface characteristics), and by taking an adequate number of samples to achieve the intended objectives of this round of works – that is, to assess the regime at the site based on a preliminary assessment of potential contamination risk. Consistent and repeatable sampling techniques and methods were utilised throughout the sampling, as described.

6.3.4 Precision

Data precision measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples. The criterion used for the assessment of RPDs is

based on guidelines given in **AS4482.1** (2005) and laboratory criteria. If duplicate results are not within the acceptable RPDs, investigation into the cause is initiated. If a cause cannot be determined the validity of the data is questioned. The proposed acceptable ranges for Relative Percent Difference (RPD) for duplicate samples are detailed in Table QC5, Appendix B.

RPD is calculated as the absolute value of the difference between the initial and repeat result divided by the average of the two results expressed as a percentage. The overall success is based on assessment of the data set as a whole and not on individual acceptance or exceedance within the data set.

6.3.5 Accuracy

Data accuracy measures the bias in a measurement system. Accuracy can be undermined by such factors as field contamination of samples, poor preservation of samples, poor sample preparation techniques and poor selection of analysis techniques by the analysing laboratory. The accuracy of the laboratory data that is generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. In regards to reference laboratory methods (eg. USEPA methods) the following accuracy levels should generally be achievable:

- within 15 % of the expected value of a certified reference material of similar matrix; or
- within 15 % of the value obtained by a separately validated and recognised quantitative method for the sample matrix.

Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards. Accuracy of field works is checked by ensuring no contamination is detected in field and trip blanks.

7.0 ASSESSMENT METHODOLOGY

7.1 SITE CONTAMINATION ASSESSMENT STRATEGY

Given the site covers an area of approximately 490.5m^2, five test bore locations were proposed to be drilled in a triangular grid pattern across the site with allowance for structural obstacles (e.g. building walls, underground, overhanging services and operating businesses).

This sampling frequency was established following the Minimum Sampling Points Required for Site Characterisation, published under the NSW EPA (1995) Sampling Design Guidelines. Soil samples were collected from various depths at each test bore location, down to 'clean' natural soils.

Laboratory analyses on representative samples were then conducted for the identified contaminants of concern, as listed in Section 5.2.

7.2 ASSESSMENT CRITERIA

Soil – The soil contaminant analytical results were interpreted with respect to the DEC (2006 Second Edition) *NEHF-F Health Based Investigation Levels applicable for Commercial or Industrial settings*. These thresholds are derived from the National Environmental Health Forum (NEHF) *Health-Based Soil Investigation Levels* (Imray and Langley, 1999), which have been nationally endorsed through the *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (NEPC, 1999), where they are presented in Table 5-A of Schedule B(1).

Thresholds for TPHs and BTEX compounds are not provided under DEC (2006) and for this reason the EPA (1994) *Threshold Concentrations for Sensitive Land Use – Soils* were adopted as the default criteria for these parameters.

For the purposes of this assessment, these adopted soil criteria are referred to as the *Soil Investigation Levels* (SILs) and are presented alongside the corresponding analytical results.

Based on the proposed development plan the site may be not ultimately paved to its boundaries with some soil accessible areas (i.e. landscape, garden, etc.) therefore the site NSW DEC 2006 *Column 5 Provisional Phytotoxicity-Based Investigation Levels* (PPILs) for heavy metals would be considered warranted.

7.3 SOIL SAMPLING

Five, separate test boreholes were drilled on the 8th November, 2011, with drilling depths ranging from approximately 2.0m to 2.55m below ground level (BGL). All boreholes were drilled at accessible locations using a track-mounted, Geoprobe direct push sampling rig with a diameter of 50mm. The sampling locations for all the boreholes and monitoring wells are illustrated in Figure 2.

Soil samples were obtained from each of the five locations, at various depths ranging between 0.2m to 2.1m BGL. All examined soils were evaluated on a qualitative basis for odour and visual signs of contamination (e.g. hydrocarbon odours, oil staining, petrochemical filming, asbestos fragments, ash, charcoal, etc.) if any, and on the basis of the field-work findings, the following observations were noted;

- No hydrocarbon odours were detected in any of the examined fill soils;
- No fibre cement sheet fragments were observed in any of the examined fill soils;
- No signs of ash, charcoal or slag were detected in any of the examined fill soils.

Borehole logs were maintained for all test holes and included sample descriptions and presented in the form of graphic borehole logs in Appendix C.

7.4 SUB-SURFACE CONDITIONS

On the basis of observations made during the drilling investigation, site sub-surface conditions, were summarised as follows:

- Filling materials of disturbed grey-grey/orange gravelly sand with clay and minor brick and crushed concrete fragments, fine to medium grained, no odour, ranging in thickness between 0.05m and 0.6m BGL; overlying
- Natural Red/grey-light grey/orange mottled clay, moderate to high plasticity, very stiff, moist, no odour, ranging in thickness between 0.45m and 1.8m BGL; overlying
- Natural orange/grey-grey, extremely weathered sandstone, fine to medium grained, moist, no odour, ranging in thickness between 1.6m and 2.55m BGL.

Groundwater/seepage was not encountered at any sampling location during the fieldwork program.

8.0 QUALITY ASSURANCE & QUALITY CONTROL

8.1 FIELD QA/QC

8.1.1 Sampling Personnel

Field investigations and soil sampling were conducted by appropriately qualified and trained professional staff with over ten years of continuous relevant experience in the assessment and management of contaminated sites. The field team comprised the following personnel:

- Anthony Barkway – Environmental Site Engineer (field work supervisor and decision maker)
- Damien Hart – Senior Earth Scientist (Driller)

Quality Assurance was maintained for this project through:

- adherence to a structured sampling and analytical plan, which was based on site operational history and other pertinent information obtained during the site contamination appraisal; and

- the use of methodologies and procedures, including the testing of quality control (QC) samples, consistent with relevant published environmental guidelines.

This section of the report focuses on the presentation of results of QC samples and discussions of deviations from the Data Acceptance Criteria (DAC) (Appendix B, Table QC5).

8.1.2 Sample Handling & Decontamination Procedures

Soil Sampling

All soil samples were collected from the push tube plastic liner using a stainless steel, hand trowel, which was decontaminated between each sampling collection. The sampling interval was accurately achieved by direct pushing the plastic liner with the catch to the desired depth. Cross contamination from higher levels in the bore was prevented by using different liners and catchers for different depth and locations during the sampling process.

Soil samples were transferred into laboratory-prepared, acid-washed and solvent-rinsed, 250g glass jars using the decontaminated stainless steel hand trowel. Each jar was filled, capped with a Teflon-lined lid and stored immediately in an insulated chest containing ice.

Analyses were subsequently conducted on discrete (uncomposited) samples for the parameters listed in Section 5.2 with the exception of two composite samples (C1 and C2) which were analysed for the non-volatile parameters: OCPs, OPPs and PCBs. These samples were laboratory prepared composites, each comprising a maximum equal mix of three discrete samples, as follows:

C1 : BH1-1 & BH2-1;
C2 : BH3-1, BH4-1 & BH5-1

Decontamination of soil sampling equipment involved the initial removal of solids by scrubbing with a nylon brush using phosphate-free detergent and potable water, followed by a final rinse with potable water.

Sample Transport

After sampling, the collected soil samples were transported in refrigerated sample chests to SGS and Envirolab using strict Chain-of-Custody procedures. Inter-laboratory duplicate (ILD) sample was sent to Envirolab Services Pty Ltd for inter-laboratory QA/QC analysis.

A Sample Receipt Advice was provided by each laboratory to indicate the condition of the samples upon receipt and copies of these are presented, along with copies of the completed Chain-of-Custody certificates, in Appendix D.

8.1.3 Rinsate Samples

A rinsate sample (R1) was collected for field quality control (QC) purposes by collecting equipment rinsate after a randomly selected round of soil sampling equipment decontamination.

The soil sampling equipment rinsate sample was analysed for Heavy Metals, TPHs and BTEX and the concentrations of these parameters in the rinsate were either presenting traces results or well below the corresponding laboratory quantitation limits. It was therefore concluded that decontamination procedures performed during the field works had been effective.

8.1.4 Blind Field Duplicate (BFD) Samples

Field QC included the sample B1, which was collected as a field, split duplicate of the sample BH1-1. This split duplicate was collected to check the level of sample representativeness that was achieved under EI's standard field procedures. The duplicate sample was presented 'blind' to SGS (the primary laboratory) to avoid any potential analytical bias, hence they were referred to as the *Blind Field Duplicates* (BFD). The preparation of the BFD sample involved the collection of a bulk quantity of soil from the same sampling point, without mixing, before dividing the material into identical vessels. The BFD sample was analysed for Heavy Metals and TPHs and the results of which are discussed in Section 8.1.6.

8.1.5 Inter-laboratory Duplicate (ILD) Sample

Inter-laboratory duplicate (ILD) samples were also part of the field QC program to assess the level of sample representativeness achieved, as well as the comparability of laboratory analytical results. The ILD sample I1 was collected as field, split duplicates of the sample BH1-1. The preparation of I1 was identical to the BFD samples as described in Section 8.1.4. The ILD sample was presented 'blind' to Envirolab (the secondary laboratory) to be analysed for Heavy Metals and TPHs.

8.1.6 Field QA/QC Data Evaluation

Completeness

All soil samples were obtained by an experienced sampler, in accordance with EI's standard field procedures. Soil samples were analysed for the identified COCs using appropriate methods and PQLs, as detailed in the SAQP. Sample documentation and sample holding times were assessed and found to be appropriate for the level of assessment undertaken.

The sampling team therefore believe that all laboratory analytical results produced were considered to be valid and usable for data interpretation for the purposes of the assessment.

Comparability

Data comparability was determined to be adequate on the basis that:

- the same SOPs were used at each bore location;
- the sampler was experienced; and
- consistent sample collection, preservation and handling methods were used.

Representativeness

The calculated soil RPDs for the BFD and ILD samples are shown in Table 3 and were considered within the Data Acceptance Criteria (Ref. Appendix B, Table QC5), indicating that the samples collected were representative of the soils present at the respective sampling locations.

Table 3. Summary of laboratory results for BFD sample B1 and ILD sample I1, field QC soil duplicates of BH1-1, with calculated relative percentage differences (% RPD)

Parameter	BH1-1	B1 (BFD SGS)	% RPD	I1 (ILD Envirolab)	% RPD
Heavy Metals					
Arsenic	4	4	0	<4	NA
Cadmium	<0.3	<0.3	NA	<0.5	NA
Chromium	12	8.9	29.7	13	8
Copper	28	21	28.6	14	66.7
Lead	7	6	15.4	7	0
Mercury	<0.05	<0.05	NA	<0.1	NA
Nickel	48	39	20.7	19	86.6
Zinc	33	28	16.4	16	69.4
TPHs					
C_{10}-C_{14}	<20	<20	NA	<50	NA
C_{15}-C_{28}	<50	<50	NA	<100	NA
C_{29}-C_{36}	<50	<50	NA	<100	NA

Notes
All results are in units of mg/kg
NA = RPD calculation was not possible to perform due to the non-detection in both samples in duplicate pair.
Where one of the samples in the duplicated pair showed detectable concentrations, the PQL of the undetected duplicate was applied for the RPD calculation.

Precision

Soil sampling was undertaken in accordance with EI's SOPs for soil sampling, which were consistent with Australian Standards / New Zealand Standards (*AS/NZS ISO 5667: 1998*). Laboratory duplicates, as well as field duplicate samples, were analysed with the limitations described above.

Accuracy (Bias)

Field instruments were subject to routine calibration and maintenance in accordance with manufacturer specifications, and were therefore considered to be as accurate as possible for field investigation purposes.

Overall Documentation Completeness:

All soil samples were classified in the field with respect to soil/fill characteristics and any observable signs of contamination based on visual and odour assessment. A Field Contamination Ranking (FCR) System was applied to each lithological soil sample, and FCR values were recorded on test bore logs.

The FCR system was assigned to samples on the following basis:

0 - for samples that did not display any visual signs of contamination or detectable odours;
1 - for samples that displayed slight visual signs of contamination and/or detectable odours;
2 - for samples that displayed obvious signs of contamination and/or detectable odours; and
3 - for samples that display significant signs of contamination and/or detectable odours.

All samples, including field QC samples, were transported to the primary and secondary laboratories under strict Chain-of-Custody conditions and appropriate copies of relevant documentation were included in the respective reports.

The overall completeness of documentation produced under the field program of the subject assessment was considered to be adequate for the purposes of drawing valid conclusions regarding the environmental condition of the site.

8.2 LABORATORY QA/QC

To undertake all the analytical tests, EI commissioned SGS as the primary laboratory and Envirolab as the secondary laboratory. SGS and Envirolab, both established analytical laboratories which operate in accordance with the guidelines set out in ISO/IEC Guide 25 "General requirements for the competence of calibration and testing laboratories", conducted all respective analyses using National Association Testing Authorities (NATA)-registered procedures

In relation to contingencies, should the pre-determined DQOs not be achieved, in accordance with each laboratory's QC policy, respective tests are accordingly repeated. Should the results again fall outside the DQOs, then sample heterogeneity may be assumed and written comment will be provided to this effect on the final laboratory certificate.

8.2.1 Sample Holding Times

All sample holding times were within standard environmental protocols as tabulated in Appendix B, Tables QC1 and QC2.

8.2.2 Test Methods and Practical Quantitation Limits (PQLs)

Practical Quantitation Limits for the tested parameters during the assessment of soils are presented in Appendix B, Tables QC3 and QC4.

8.2.3 Method Blanks

Concentrations of all parameters in method blanks during the assessment were below the laboratory PQLs and were therefore within the DAC.

8.2.4 Laboratory Duplicate Samples

RPDs and ILDs were not calculated for parameters showing concentrations below instrument detection limits. The calculated RPDs for soil samples for all remaining pairs of analytical results between primary and duplicate samples ranged from 0% for *Arsenic* and *Lead* to 86.6% for *Nickel*, indicating that some of the RPDs and ILDs samples were found to be higher than the expected range (i.e. 15%) for homogenous soils. This can be explained by the fact that soil samples were not perfectly homogenous been consistent with field observations, as described in the borehole logs (Ref. Appendix C), it was concluded that the precision and accuracy of the laboratory analyses were acceptable.

8.2.5 Laboratory Control Samples

The Laboratory Control Samples (LCS) for the analysis batches were within acceptable ranges and conformed to the DAC.

8.2.6 Matrix Spikes

The matrix spikes of the analysis batches were within acceptable ranges and conformed to the DAC.

8.2.7 Laboratory QA/QC Data Evaluation

Completeness

Checks were conducted with respect to the laboratory data reported by the contract laboratories and it was found that documentation was correct, all critical samples and analytes were analysed in accordance with the Sampling Analytical Quality Plan (SAQP), appropriate methods and PQLs had been used, documentation was complete and holding times had been complied with.

Comparability

Data comparability was determined to be adequate on the basis that:

- the same SOPs were used at each bore location;
- the sampler was experienced;
- consistent sample collection, preservation and handling methods were used;
- consistent sample analytical methods were used;
- the same units were used; and
- sample PQLs were predominantly the same.

Sample PQLs varied slightly depending on the need for sample dilution at the laboratory as required. In view of the above points, EI concluded that data comparability requirements were adequately achieved for this assessment.

Representativeness

The RPDs for the BFD samples were within the Data Acceptance Criteria indicating that the samples collected were representative of the soils present at the respective sampling locations.

Precision

The RPDs of the intra-laboratory duplicates were within the assessment criteria, which indicated that the sampling and laboratory precision was within acceptable limits.

Accuracy (Bias)

Laboratory accuracy has been assessed by analysis of method blanks and percent recovery of laboratory control samples, matrix spikes and surrogates. With the exceptions noted above, these results indicate the accuracy of the laboratory was within acceptable limits.

8.3 QA/QC DOCUMENTATION

Chain-of-Custody certificates were appropriately signed on receipt of samples and laboratory batch numbers were assigned for internal tracking purposes. All such certificates were followed by a Sample Receipt Advice form issued by the respective environmental laboratory to EI, which confirmed the receipt of samples and described sample condition and preservation at the time of receipt by the laboratory.

The final aspect of QA/QC documentation applied under the soil investigation comprised the intra-laboratory QA/QC test reports, which were attached to all laboratory analytical reports for the respective components of the project.

8.4 LABORATORY ANALYTICAL RESULTS

8.4.1 Soil Investigation Results

Laboratory analytical results for the representative discrete soil samples are summarised in Tables 4 to 8 and presented in detail in copies of the laboratory analytical reports in Appendix E. Tables 4 to 8 also include the relevant soil criteria, adjusted for soil compositing where appropriate.

Table 4. Summary of Laboratory Analysis for Heavy Metals in Soils

Sample ID	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
BH1-1	4	<0.3	12	28	7	<0.05	48	33
BH2-1	<3	0.5	11	58	3	<0.05	120	52
BH3-1	<3	0.4	11	43	6	<0.05	80	48
BH4-1	6	<0.3	5.4	7.7	17	<0.05	4.5	36
BH5-1	7	0.3	11	28	7	<0.05	54	43
SILs	**500**	**100**	**500#**	**5,000**	**1,500**	**75**	**3,000**	**35,000**
PPILs	**20**	**3**	**400**	**100**	**600**	**1**	**60**	**200**

Notes:
All results are in units of mg/kg; unless noted
SILs DEC (2006 Second Edition) *NEHF-F Health Based Investigation Levels applicable for Commercial or Industrial settings.*
(#) DEC NSW thresholds are for Chromium (VI). It is assumed all detected Chromium is Chromium (III), as Chromium (VI) would be too unstable to exist under normal circumstances.

Table 5. Summary of Laboratory Analysis for TPH and BTEX in Soils

Sample ID	Total Petroleum Hydrocarbons				Benzene	Toluene	Ethyl Benzen	Total Xylenes
	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}				
BH1-1	<20	<20	<50	<50	<0.1	<0.1	<0.1	<0.3
BH2-1	<20	<20	<50	<50	<0.1	<0.1	<0.1	<0.3
BH3-1	<20	<20	<50	<50	<0.1	<0.1	<0.1	<0.3
BH4-1	<20	<20	<50	<50	<0.1	<0.1	<0.1	<0.3
BH5-1	<20	<20	<50	<50	<0.1	<0.1	<0.1	<0.3
SILs	**65**	**Total 1,000**			**1**	**1.4**	**3.1**	**14**

Notes:
All results are in units of mg/kg; unless noted
SILs NSW EPA (1994) *Threshold concentrations for sensitive land use soils,* Contaminated Sites: Guidelines for Assessing Service Station Sites.

Table 6. Summary of Laboratory Analysis for PAHs in Soils

Sample ID	PAHs	
	Benzo[a]Pyrene	Total PAHs
BH1-1	<0.1	<0.8
BH2-1	<0.1	<0.8
BH3-1	<0.1	<0.8
BH4-1	<0.1	<0.8
BH5-1	<0.1	<0.8
SILs	**5**	**100**

Notes:
All results are in units of mg/kg; unless noted
SILs DEC (2006 Second Edition) *NEHF-F Health Based Investigation Levels applicable for Commercial or Industrial settings*.
(#) DEC NSW thresholds are for Chromium (VI). It is assumed all detected Chromium is Chromium (III), as Chromium (VI) would be too unstable to exist under normal circumstances.

Table 7. Summary of Laboratory Analysis for OCPs, PCBs and OPPs in Soils

Sample ID	OCPs							Total OPPs (mg/kg)	Total PCBs (mg/kg)
	aldrin (mg/kg)	dieldrin (mg/kg)	chlor-dane (mg/kg)	hepta-chlor (mg/kg)	DDT (mg/kg)	DDD (mg/kg)	DDE (mg/kg)		
C1	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	ND	<0.9
C2	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<0.10	ND	<0.9
SILs	**Total 50**		**250**	**50**	**Total 1,000**			**NR**	**50**

Notes:
SILs*:* DEC (2006 Second Edition) *NEHF-F Health Based Investigation Levels applicable for Commercial or Industrial settings.*
SILs are adjusted for potential dilution due to sample compositing
ND = Concentrations were found to be below instrument detection limits
NR = No Recommended criteria are currently available for the indicated parameter(s)

Table 8. Summary of Laboratory Analysis for Asbestos

Sample ID	Asbestos Identification
BH1-1	No Asbestos Detected
BH2-1	No Asbestos Detected
BH3-1	No Asbestos Detected
BH4-1	No Asbestos Detected
BH5-1	No Asbestos Detected
SIL	**NIL***

Notes:
SILs (*) DECCW (2009) *Waste Classification Guidelines for non-asbestos waste.*

Heavy Metals

Heavy metals concentrations were detected in all tested samples, which were below the PPILs and SILs.

TPHs and BTEX

Non-detectable concentrations of the screened TPH fractions and BTEX compounds were identified in the tested samples, being below the adopted EPA (1994) *Threshold Concentrations for Sensitive Land Use - Soils*.

PAHs

No detectable concentrations of the screened PAH compounds were identified in any of the tested samples, all within the adopted SILs.

Asbestos

No detectable asbestos concentrations were identified in any of the tested soil samples.

OCP, OPP and PCB

No detectable concentration of any of the screened OCP compounds were identified in the tested samples, with all laboratory quantitation limits being within the corresponding SILs, after adjustment for potential dilution due to compositing.

9.0 CONCLUSIONS AND RECOMMENDATIONS

The property located at 84-86 Kiora Road, Miranda, NSW, was the subject of the Stage 2 Environmental Site Assessment in order to assess the potential for on-site contamination associated with the identified former land uses. Based on the findings of this Environmental Site Assessment and previous investigation carried out by EI (April, 2011), it was concluded that:

- The soil profile across the site was characterised as comprising of approximately 0.05m to 0.6m BGL filling materials of disturbed grey-grey/orange gravelly sand with clay and minor brick and crushed concrete fragments, fine to medium grained; overlying natural red/grey-light grey/orange mottled clay, moderate to high plasticity, very stiff, ranging in thickness between 0.45m and 1.8m BGL; overlying natural orange/grey-grey, extremely weathered sandstone, fine to medium grained, ranging in thickness between 1.6m and 2.55m BGL.

- Five test boreholes were selected using a mixed judgemental / systematic, triangular sampling pattern, with allowance for structural obstacles (e.g. building walls, underground and overhanging services and other physical obstructions) as well as targeting the areas of environmental concern;

- Laboratory analytical results for soil samples revealed:

    - Low or no detectable concentrations of the screened heavy metals were identified in the tested samples, all within the adopted PPILs and SILs.

    - Non-detectable concentrations of the screened TPH fractions were identified in the tested samples, all below the adopted EPA (1994) *Threshold Concentrations for Sensitive Land Use – Soils.*

    - No detectable BTEX concentrations were identified in any of the tested samples being below the adopted EPA (1994) *Threshold Concentrations for Sensitive Land Use – Soils.*

- No detectable concentrations of the screened PAH compounds were identified in any of the tested samples, all within the adopted SILs.

- No detectable asbestos concentrations were identified in any of the tested samples.

- No detectable concentrations of any of the screened OCPs, PCBs and OPPs were identified in the tested samples, with all laboratory quantitation limits being within the corresponding SILs after adjustment for potential dilution due to sample compositing.

- Groundwater was not encountered during this assessment.

Recommendations

In view of the above findings, it was concluded that the site soils present a low risk to human health, the environment or the aesthetic enjoyment of the land, and the site is suitable for the proposed development.

Given the restricted access within the existing building area it is recommended that an inspection should be carried out once this building is demolished to confirm that the subsurface condition of this area are consistent with the remainder of the site.

Should site soils require excavation and disposed from the site, then these soils should be classified in accordance with the DECCW (2009) *Waste Classification Guidelines*. Any soils to be imported onto the site for the purpose of back-filling excavated areas will be Virgin Excavated Natural Materials (VENM) and will also require validation testing in accordance with the relevant EPA / DECC regulatory guidelines to confirm soil suitability for the proposed land use.

10.0 STATEMENT OF LIMITATIONS

The findings presented in this report are the result of discrete and specific sampling methodologies used in accordance with best industry practices and standards. Due to the site-specific nature of soil sampling from point locations, it is considered likely that all variations in subsurface conditions across a site cannot be fully defined, no matter how comprehensive the field investigation program.

While normal assessments of data reliability have been made, EI assumes no responsibility or liability for errors in any data obtained from previous assessments conducted on site, regulatory agencies (e.g. Council, DEC, etc.), statements from sources outside of EI, or developments resulting from situations outside the scope of works of this project.

Despite all reasonable care and diligence, the ground conditions encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. In addition, site characteristics may change at any time in response to variations in natural conditions, chemical reactions and other events, e.g. groundwater movement and or spillages of contaminating substances. These changes may occur subsequent to EI's investigations and assessment.

EI's assessment is necessarily based upon the result of the site investigation and the restricted program of surface and subsurface sampling, screening and chemical testing which was set out in the proposal. Neither EI, nor any other reputable consultant, can provide unqualified warranties nor does EI assume any liability for site conditions not observed or accessible during the time of the investigations.

This report was prepared for the above named client and no responsibility is accepted for use of any part of this report in any other context or for any other purpose or by other third parties. This report does not purport to provide legal advice.

For and on behalf of,

ENVIRONMENTAL INVESTIGATIONS

ERIC GERGES
Project Manager

DR VAGNER JORDEN
Principal - Environment

REFERENCES

Australian and New Zealand Environment and Conservation Council, 2000: *Guidelines for Fresh and Marine Water Quality, National Water Quality Management Strategy*, October 2000.

Chapman, G.A. and Murphy, C.L. (1989) Soil Landscapes of the Sydney 1:100 000 sheet, Soil Conservation Service of NSW, Sydney, September 1989.

DEC (2006) *Soil Investigation Levels for Urban Development Sites in NSW*, in *Guidelines for the NSW Site Auditor Scheme,* 2nd Edn., NSW Dept. of Environment and Conservation, DEC, 2006.

DECCW (2009) *Waste Classification Guidelines*. Department of Environment, Climate Change and Water, New South Wales, DECCW 2009/806, December, 2009.

DMR (1966) *1:250,000 Geological Series Sheet S1 56-2.* Geological Survey of New South Wales, Department of Mineral Resources.

EPA (1994) *Guidelines for Assessing Service Station Sites*. Environment Protection Authority of New South Wales, Contaminated Sites Unit, EPA 94/119, December 1994.

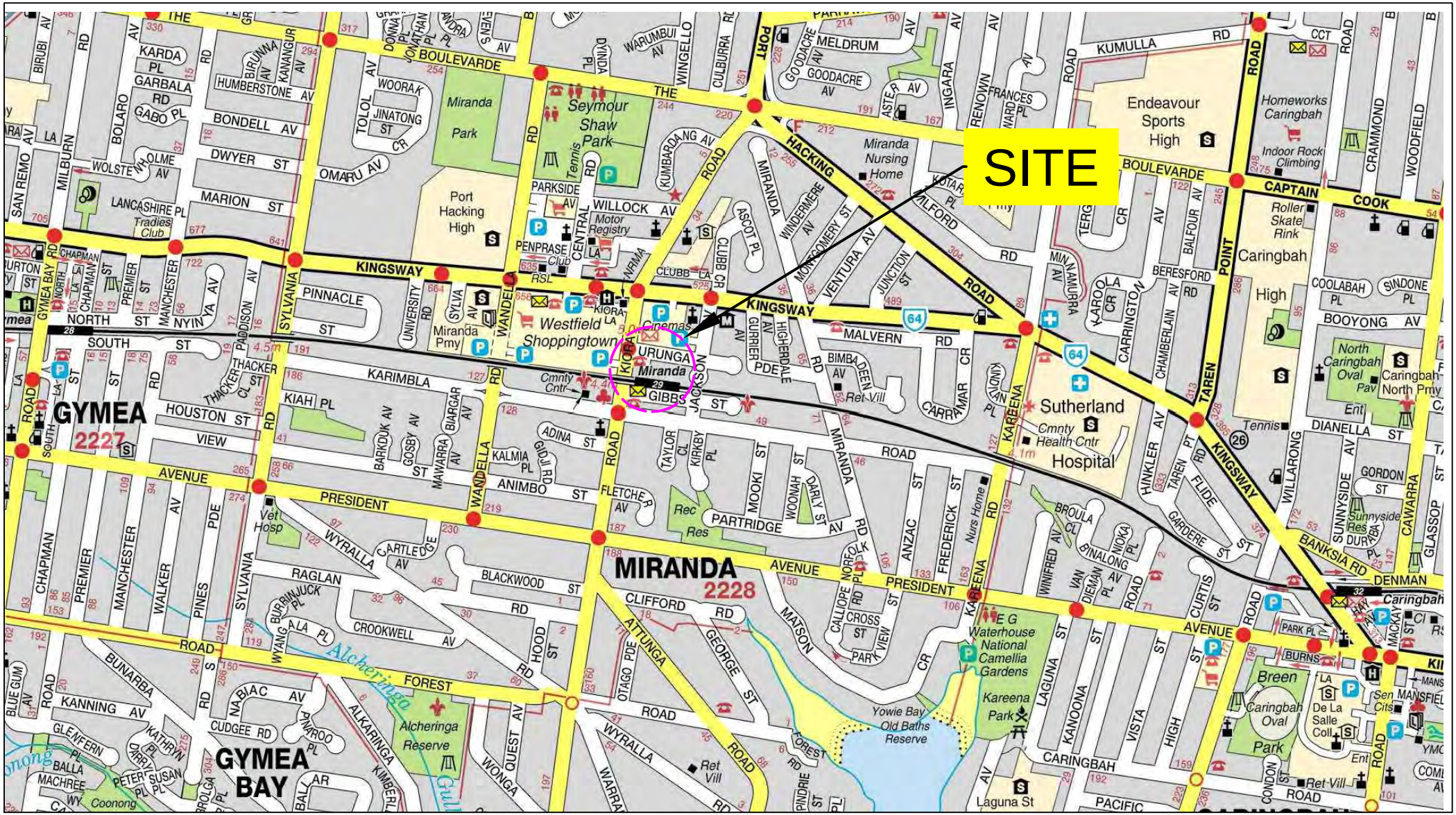
EPA (1995) *Sampling Design Guidelines*. Environment Protection Authority of New South Wales, Contaminated Sites Unit, EPA 95/59, September 1995.

NEPC (1999) *National Environmental Protection (Assessment of Site Contamination) Measure 1999*. National Environmental Protection Council, December 1999.

ABBREVIATIONS

AAS	Atomic Absorption Spectrometry
AHD	Australian Height Datum
AST	Aboveground Storage Tank
ANZECC	Australian and New Zealand Environment Conservation Council
B(a)P	Benzo(a)Pyrene
BGL	Below Ground Level
BH	Borehole
BTEX	Benzene, Toluene, Ethyl benzene, Xylene
COC	Chemical of Concern
DEC	Department of Environment and Conservation, NSW
DECC	Department of Environment and Climate Change, NSW (formerly DEC)
DECCW	Department of Environment, Climate Change and Water, NSW (formerly DECC)
DP	Deposited Plan
DQO	Data Quality Objective
EI	Environmental Investigations
EIL	Ecological Investigation Level
EPA NSW	Environment Protection Authority, New South Wales
ESA	Environmental Site Assessment
GC-ECD	Gas Chromatograph-Electron Capture Detector
GC-FID	Gas Chromatograph-Flame Ionisation Detector
GC-MS	Gas Chromatograph-Mass Spectrometer
HIL	Health Based Investigation Level
ICP-AES	Inductively Couple Plasma – Atomic Emission Spectra
NATA	National Association of Testing Authorities, Australia
NEPC	National Environmental Protection Council
NHMRC	National Health and Medical Research Council
OCPs	Organochlorine Pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PID	Photoionisation Detector
PQL	Practical Quantitation Limit
P&T	Purge & Trap
QC	Quality Control
RAC	Remediation Acceptance Criteria
RAP	Remediation Action Plan
RPD	Relative Percentage Difference
SILs	Soil Investigation Levels
SWL	Standing Water Test
TP	Test Pit
TPHs	Total Petroleum Hydrocarbons
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound
UCL	Upper Confidence Limit

FIGURES



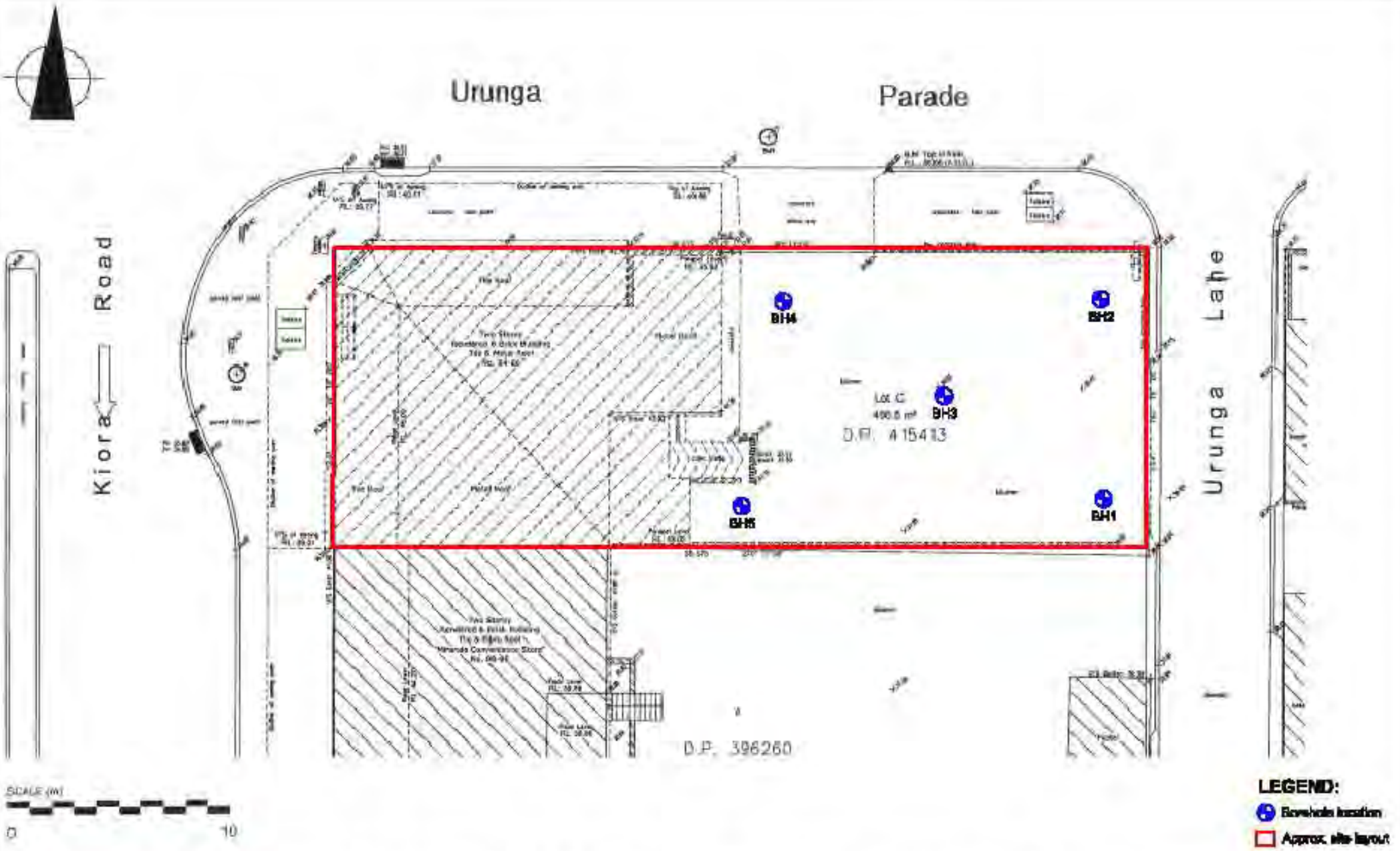
Drawn:	A.B	
Approved:	V.J	
Date:	10-11-11	
Approx Scale:	N.T.S	

Environmental Investigations
Contamination Assessment Management & Geotechnical
P O Box 215, ST PETERS 2044
Ph (02) 9516 0722 Fax (02) 9516 0741

Moran Corporation Pty Ltd
Stage 2 Environmental Site Assessment
84-86 Kiora Road, Miranda, NSW
Site Locality Plan

Figure: 1

Project: E1481.1



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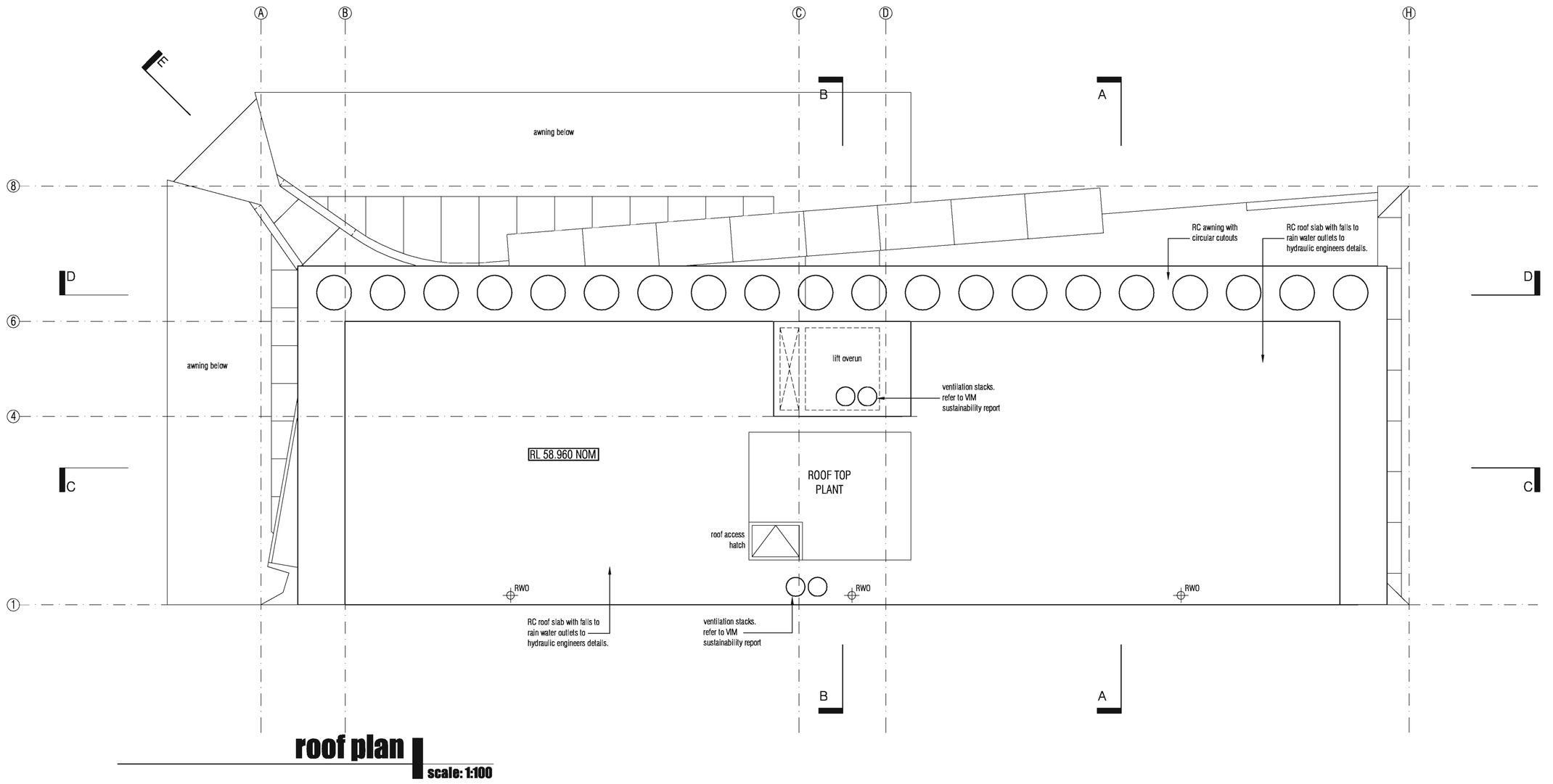
Approved:	V.J.
Date:	10-11-11
Approx Scale:	as shown

Moran Corporation Pty. Ltd.
Stage 2 Environmental Site Assessment
84-86 Kiora Rd., Miranda, NSW.
Sampling Plan

Figure: 2

Project: E1481.1

APPENDIX A
PROPOSED DEVELOPMENT PLAN



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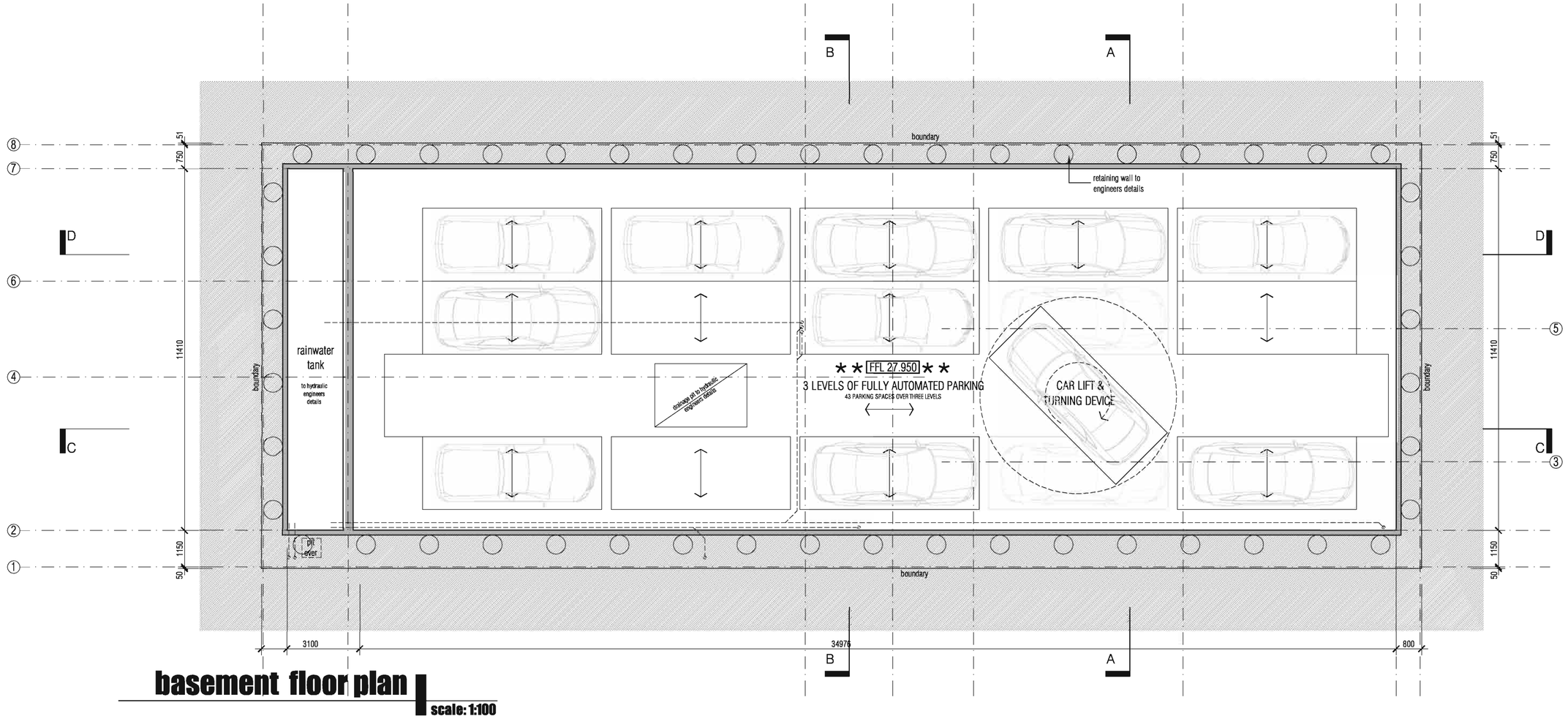

basement floor plan
scale: 1:100

T.N. 12°34'52" 13.02.2009 M.N.
D.P. 415413

GREEN PRINCIPLES

NATURAL VENTILATION
automated operable window system
lire stair and lift core adapted as solar exhaust chimneys
night purging

FEATURE DOUBLE GLAZED VENTILATED FACADE
plenum to utilise stack effect ventilation
floors 1 thru 4

FEATURE STACK EFFECT VENTILATION VIA GLAZED 'CHIMNEY'
lower ground floor (at north west corner of building)

LOW EMISIVITY DOUBLE GLAZING
throughout

INTELLIGENT BUILDING MANAGEMENT SYSTEM
controlling natural ventilation, window openings, heating, cooling, solar chimneys, security & lighting.

RENEWABLE ENERGY PHOTOVOLTAIC'S ON ROOF

THERMAL MASS CONSTRUCTION
polished concrete floors and precast concrete walls to improve summer and winter comfort

LOW TOXIC FINISHES

RAINWATER CAPTURE & STORAGE
for reuse in sanitary facilites watering of plants and washing down of hard surfaces

WATER EFFICIENT FIXTURES & FITTINGS

MAXIMISED NATURAL DAYLIGHTING
with low energy light fittings

SOLAR HOT WATER UNITS

REFER TO ENVIRONMENTAL SUSTAINABILITY DESIGN REPORT
by VIM Sustainability

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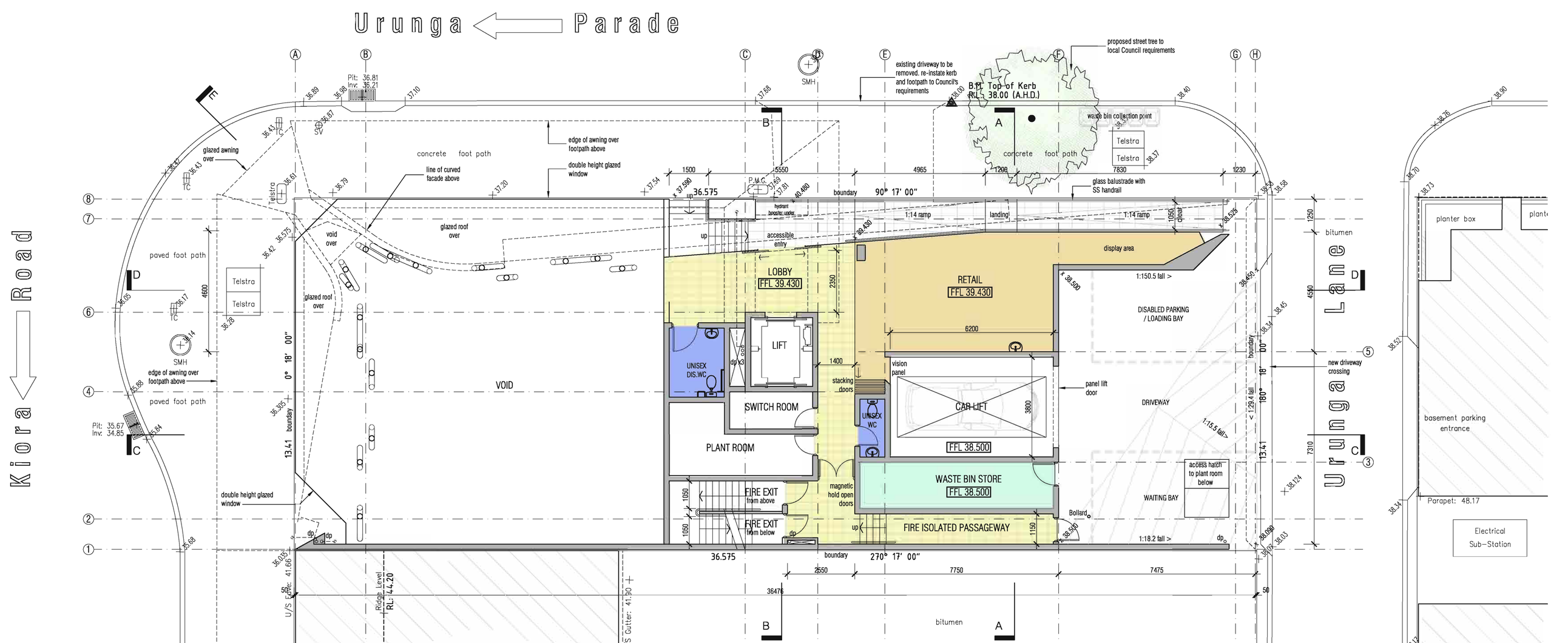
amendments	date	description
3	11/05/2011	issued to all consultants

title : : **BASEMENT & ROOF PLANS**

0 1 2 3 4 5 10m

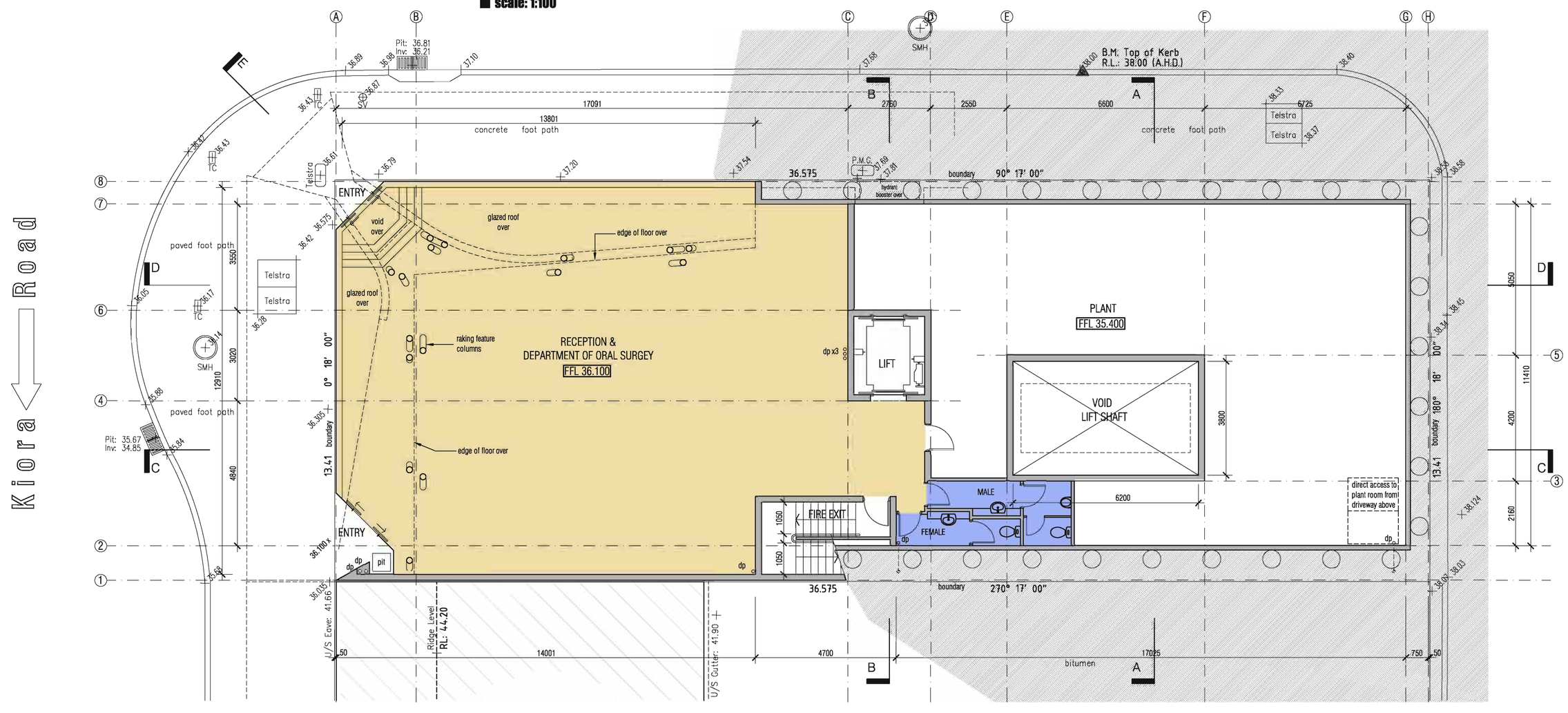
job # : : 0903
scale : : 1:100 @ A1
date : : Decemeber 2010

drawing number : : **2.01** issue : : 3



upper ground floor plan

scale: 1:100



lower ground floor plan

scale: 1:100

T.N. M.N. 12°34'52" 13.02.2009 D.P. 415413

GREEN PRINCIPLES

NATURAL VENTILATION
automated operable window system
fire stair and lift core adapted as solar exhaust chimneys
night purging

FEATURE DOUBLE GLAZED VENTILATED FACADE
plenum to utilise stack effect ventilation
floors 1 thru 4

FEATURE STACK EFFECT VENTILATION VIA GLAZED 'CHIMNEY'
lower ground floor (at north west corner of building)

LOW EMISIVITY DOUBLE GLAZING
throughout

INTELLIGENT BUILDING MANAGEMENT SYSTEM
controlling natural ventilation, window openings, heating, cooling, solar chimneys, security & lighting.

RENEWABLE ENERGY PHOTOVOLTAIC'S ON ROOF

THERMAL MASS CONSTRUCTION
polished concrete floors and precast concrete walls to improve summer and winter comfort

LOW TOXIC FINISHES

RAINWATER CAPTURE & STORAGE
for reuse in sanitary facilites watering of plants and washing down of hard surfaces

WATER EFFICIENT FIXTURES & FITTINGS

MAXIMISED NATURAL DAYLIGHTING
with low energy light fittings

SOLAR HOT WATER UNITS

REFER TO ENVIRONMENTAL SUSTAINABILITY DESIGN REPORT
by VIM Sustainability

KIORA ROAD, MIRANDA NSW 2228
MIRANDA DENTAL HOSPITAL - 84-86

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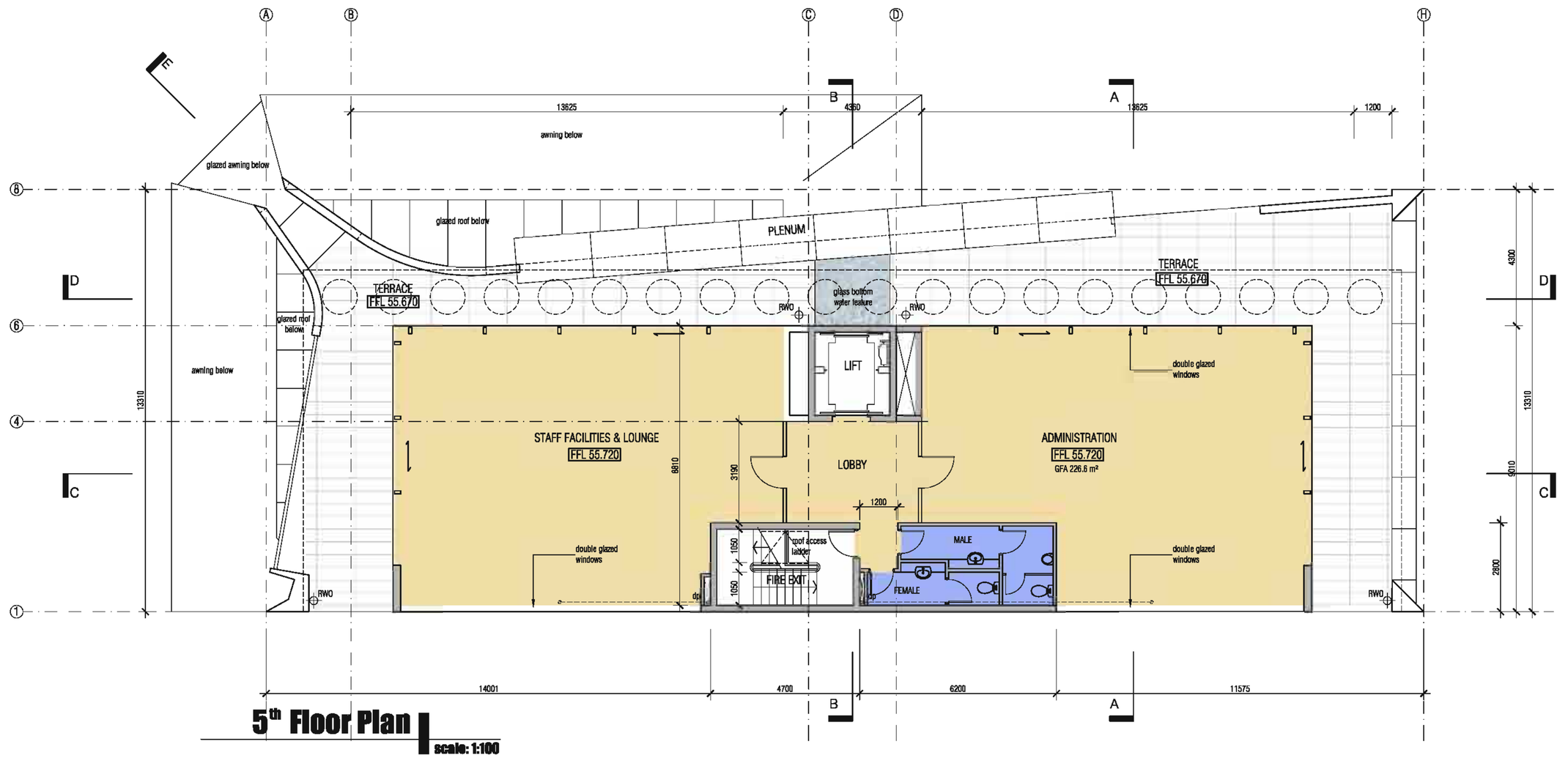
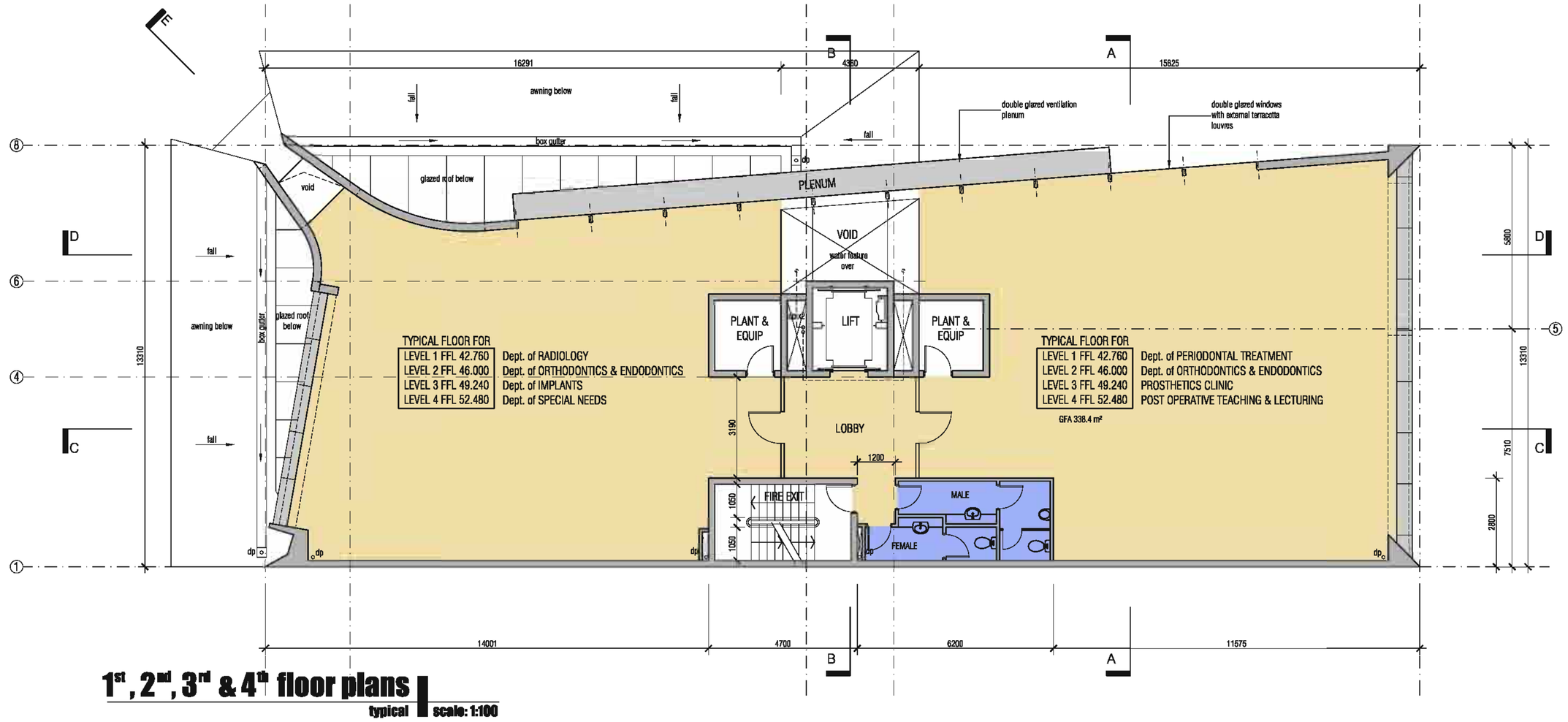
amendments	date	description
3	11/05/2011	issued to all consultants

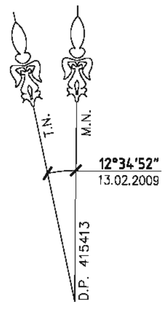
LOWER & UPPER GROUND FLOOR PLANS

title : :
0 1 2 3 4 5 10m
job # : : 0903
scale : : 1:100 @ A1
date : : Decemeber 2010

drawing number : : 2.02
issue : : 3







GREEN PRINCIPLES

NATURAL VENTILATION
automated operable window system
fire stair and lift core adapted as solar exhaust chimneys
night purging

FEATURE DOUBLE GLAZED VENTILATED FACADE
plenum to utilise stack effect ventilation
floors 1 thru 4

FEATURE STACK EFFECT VENTILATION VIA GLAZED 'CHIMNEY'
lower ground floor (at north west corner of building)

LOW EMISIVITY DOUBLE GLAZING
throughout

INTELLIGENT BUILDING MANAGEMENT SYSTEM
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RENEWABLE ENERGY PHOTOVOLTAIC'S ON ROOF

THERMAL MASS CONSTRUCTION
polished concrete floors and precast concrete walls to improve summer and winter comfort

LOW TOXIC FINISHES

RAINWATER CAPTURE & STORAGE
for reuse in sanitary facilites watering of plants and washing down of hard surfaces

WATER EFFICIENT FIXTURES & FITTINGS

MAXIMISED NATURAL DAYLIGHTING
with low energy light fittings

SOLAR HOT WATER UNITS

REFER TO ENVIRONMENTAL SUSTAINABILITY DESIGN REPORT
by VIM Sustainability

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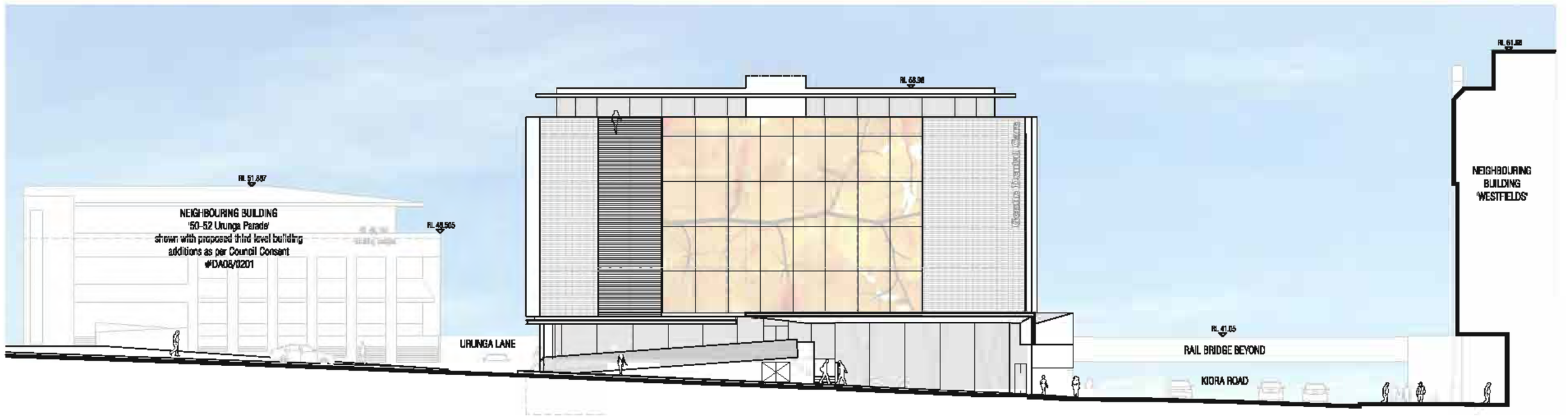
amendments	date	description
3	11/05/2011	Issued to all consultants

title : : **1st, 2nd, 3rd, 4th & 5th FLOOR PLANS**

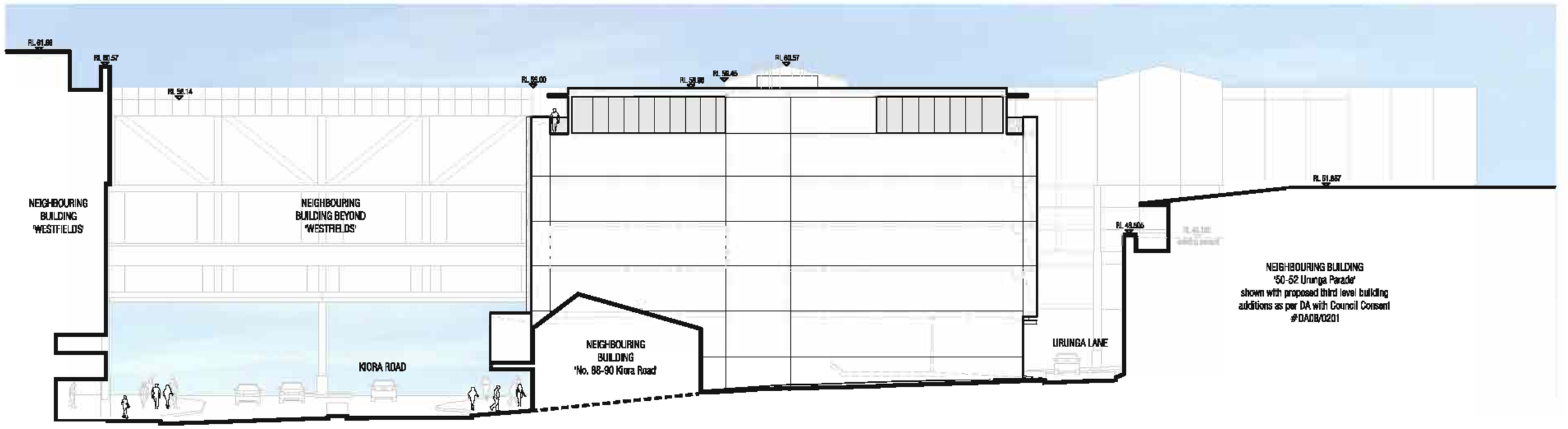
0 1 2 3 4 5 10m

job # : : 0903
scale : : 1:100 @ A1
date : : Decemeber 2010

drawing number : : **2.03** issue : : 3

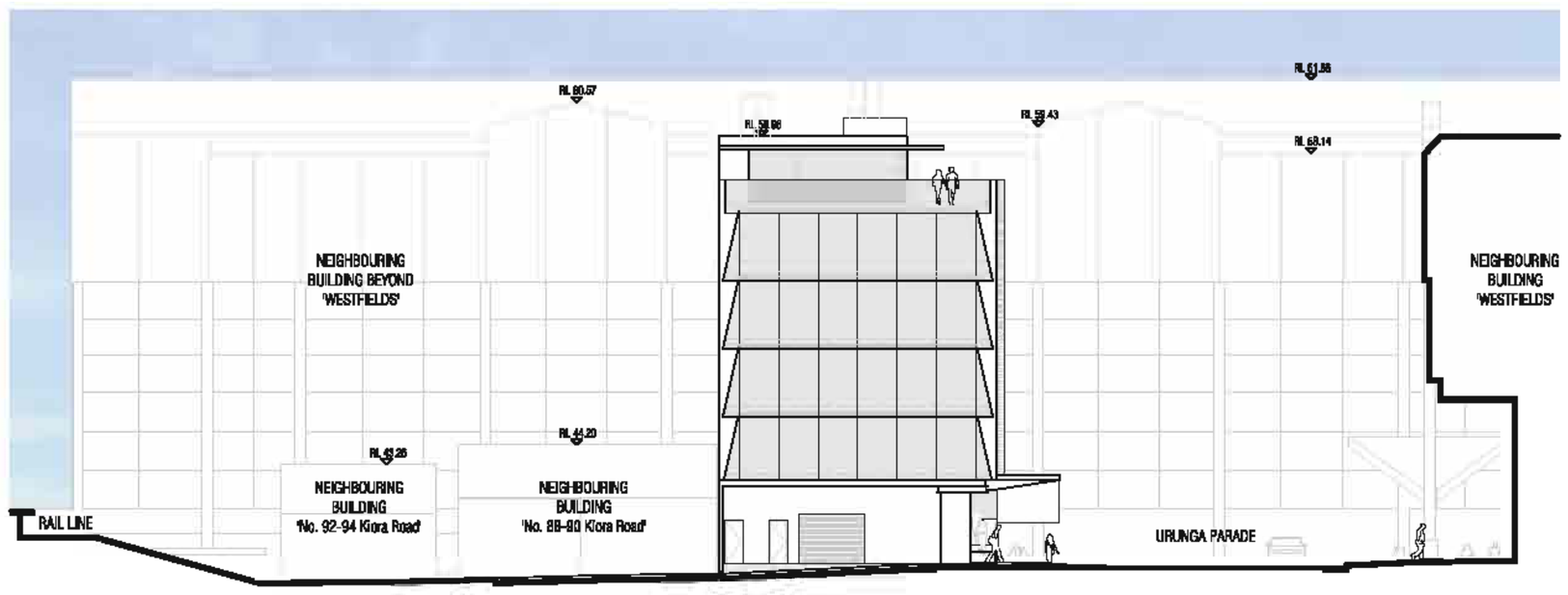


north elevation
from urunga parade | scale: 1:200



south elevation
scale: 1:200

west elevation
from kiora rd | scale: 1:200



east elevation
from urunga lane | scale: 1:200

GREEN PRINCIPLES

NATURAL VENTILATION
automated operable window system
fire stair and lift core adapted as solar exhaust chimneys
night purging

FEATURE DOUBLE GLAZED VENTILATED FACADE
plenum to utilise stack effect ventilation
floors 1 thru 4

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lower ground floor (at north west corner of building)

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throughout

INTELLIGENT BUILDING MANAGEMENT SYSTEM
controlling natural ventilation, window openings, heating, cooling, solar chimneys, security & lighting.

RENEWABLE ENERGY PHOTOVOLTAICS ON ROOF

THERMAL MASS CONSTRUCTION
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LOW TOXIC FINISHES

RAINWATER CAPTURE & STORAGE
for reuse in sanitary facilities watering of plants and washing down of hard surfaces

WATER EFFICIENT FIXTURES & FITTINGS

MAXIMISED NATURAL DAYLIGHTING
with low energy light fittings

SOLAR HOT WATER UNITS

REFER TO ENVIRONMENTAL SUSTAINABILITY DESIGN REPORT
by WM Sustainability

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CONTEXT ELEVATIONS

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amendments	date	description
3	11/05/2011	issued to all consultants

title : :
0 2 4 6 8 10 20m
job # : : 0903 @ A1
scale : : 1:200
date : : December 2010

drawing number : : 3.01 | issue : : 3

GREEN PRINCIPLES

NATURAL VENTILATION
automated operable window system
fire stair and lift core adapted as solar exhaust chimneys
night purging

FEATURE DOUBLE GLAZED VENTILATED FACADE
plenum to utilise stack effect ventilation
floors 1 thru 4

FEATURE STACK EFFECT VENTILATION VIA GLAZED 'CHIMNEY'
lower ground floor (at north west corner of building)

LOW EMISIVITY DOUBLE GLAZING
throughout

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controlling natural ventilation, window openings, heating, cooling, solar chimneys, security & lighting.

RENEWABLE ENERGY PHOTOVOLTAIC'S ON ROOF

THERMAL MASS CONSTRUCTION
polished concrete floors and precast concrete walls
to improve summer and winter comfort

LOW TOXIC FINISHES

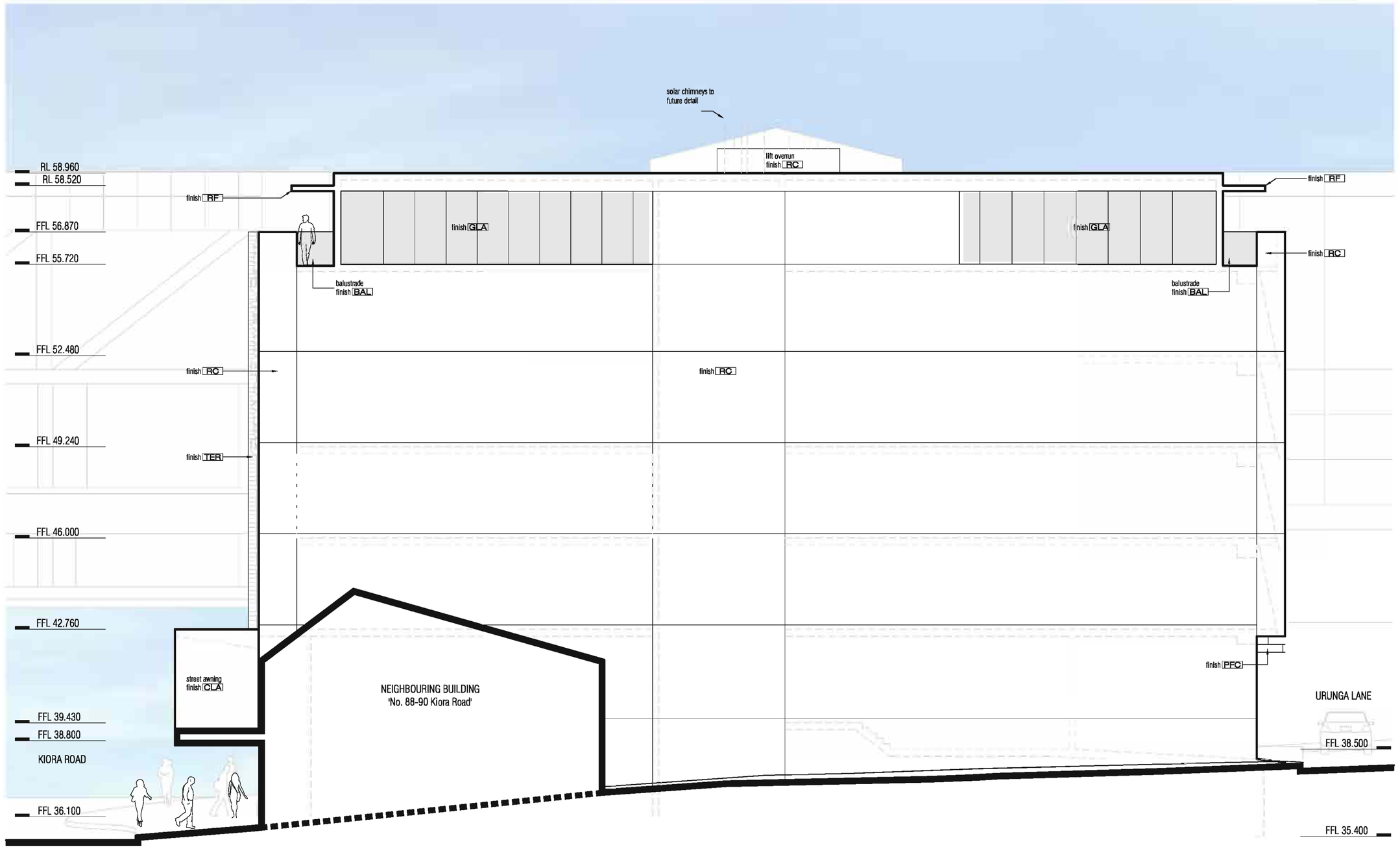
RAINWATER CAPTURE & STORAGE
for reuse in sanitary facilites watering of plants and washing down of hard surfaces

WATER EFFICIENT FIXTURES & FITTINGS

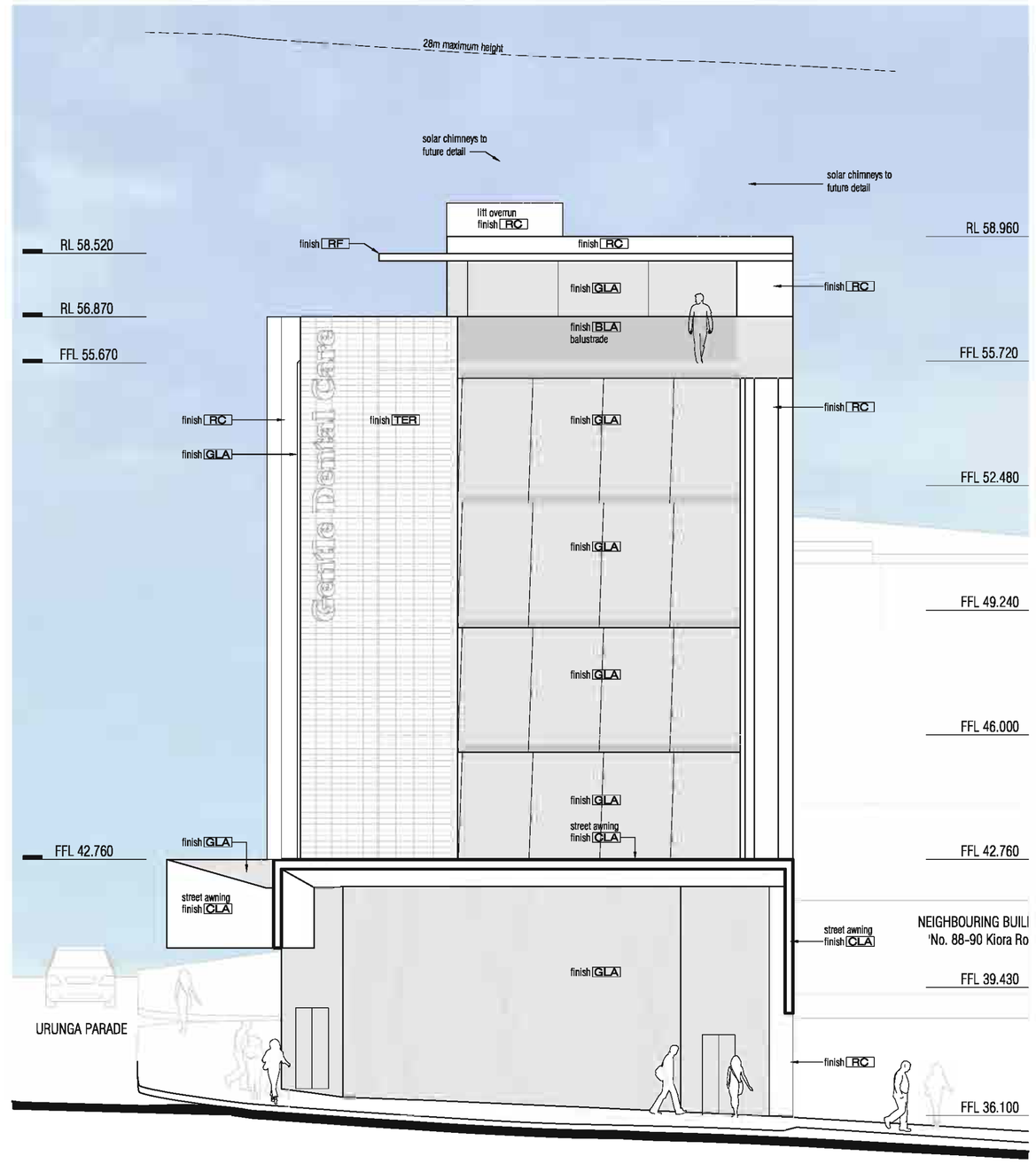
MAXIMISED NATURAL DAYLIGHTING
with low energy light fittings

SOLAR HOT WATER UNITS

REFER TO ENVIRONMENTAL SUSTAINABILITY DESIGN REPORT
by VIM Sustainability



south elevation
kiora road | scale: 1:100



west elevation
nranga lane | scale: 1:100

FINISHES SCHEDULE

CODE	DESCRIPTION
BAL	toughened clear glass balustrade.
CLA	steel framed cantilevered street awning with prefinished metal cladding all round.
DGL	low-e double glazed and ventilated plenum with digital printed image on glazing interlayer.
GLA	low-e double glazed alum windows, awnings and skylights
PFC	mild steel PFC with MIO paint finish. colour: charcoal
RC	off-form / precast concrete walls.
RF	off form concrete roof and awning.
SC	core-filled MS CHS column. paint finish: purple
TER	terracotta ventilated facade system over insulation and off-form structural concrete walls.
TER	terracotta external louvres, to match ventilated facade adjacent, over low-e glazed windows.

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SOUTH & WEST ELEVATIONS

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amendments	date	description
3	11/05/2011	issued to all consultants

title : :
0 1 2 3 4 5 10m
job # : : 0903
scale : : 1:100 @ A1
date : : Decemeber 2010

drawing number : : 3.02
issue : : 3

GREEN PRINCIPLES

NATURAL VENTILATION
automated operable window system
fire stair and lift core adapted as solar exhaust chimneys
night purging

FEATURE DOUBLE GLAZED VENTILATED FACADE
plenum to utilise stack effect ventilation
floors 1 thru 4

FEATURE STACK EFFECT VENTILATION VIA GLAZED 'CHIMNEY'
lower ground floor (at north west corner of building)

LOW EMISIVITY DOUBLE GLAZING
throughout

INTELLIGENT BUILDING MANAGEMENT SYSTEM
controlling natural ventilation, window openings, heating, cooling, solar chimneys, security & lighting.

RENEWABLE ENERGY PHOTOVOLTAIC'S ON ROOF

THERMAL MASS CONSTRUCTION
polished concrete floors and precast concrete walls to improve summer and winter comfort

LOW TOXIC FINISHES

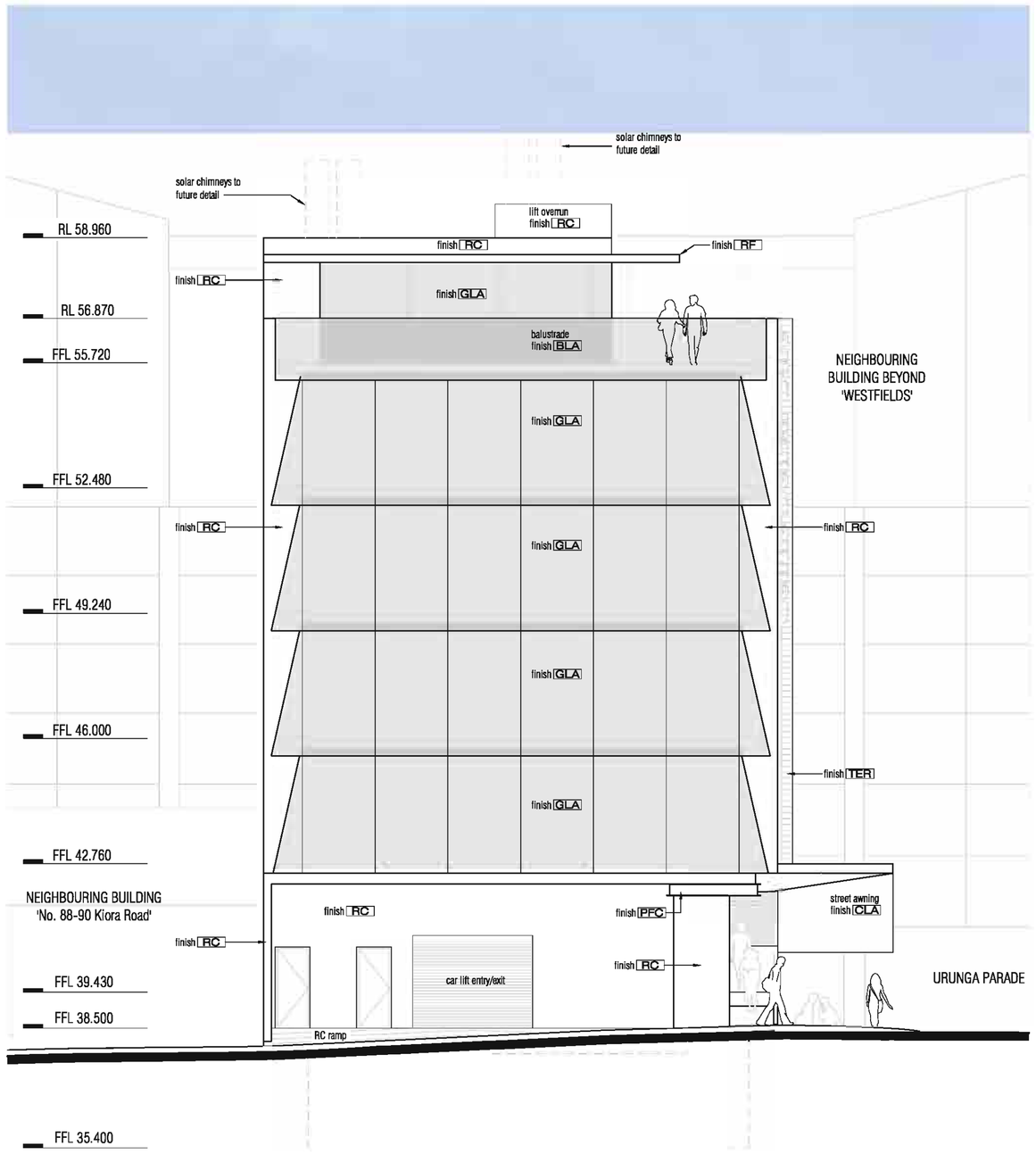
RAINWATER CAPTURE & STORAGE
for reuse in sanitary facilites watering of plants and washing down of hard surfaces

WATER EFFICIENT FIXTURES & FITTINGS

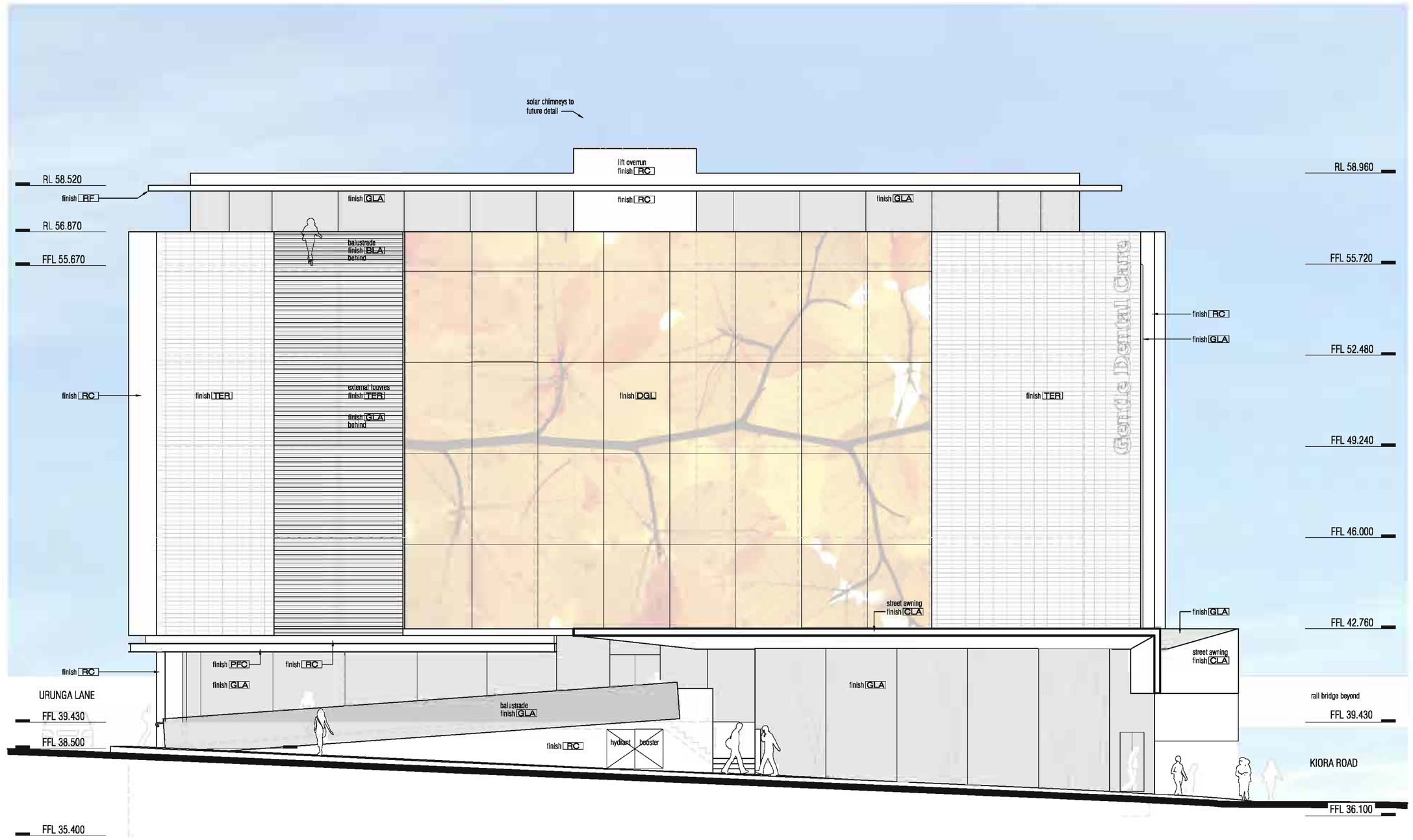
MAXIMISED NATURAL DAYLIGHTING
with low energy light fittings

SOLAR HOT WATER UNITS

REFER TO ENVIRONMENTAL SUSTAINABILITY DESIGN REPORT
by VIM Sustainability



east elevation
urunga parade | scale: 1:100



north elevation
urunga parade | scale: 1:100

FINISHES SCHEDULE

CODE	DESCRIPTION
BAL	toughened clear glass balustrade.
CLA	steel framed cantilevered street awning with prefinished metal cladding all round.
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TER	terracotta external louvres, to match ventilated facade adjacent, over low-e glazed windows.

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EAST & NORTH ELEVATIONS

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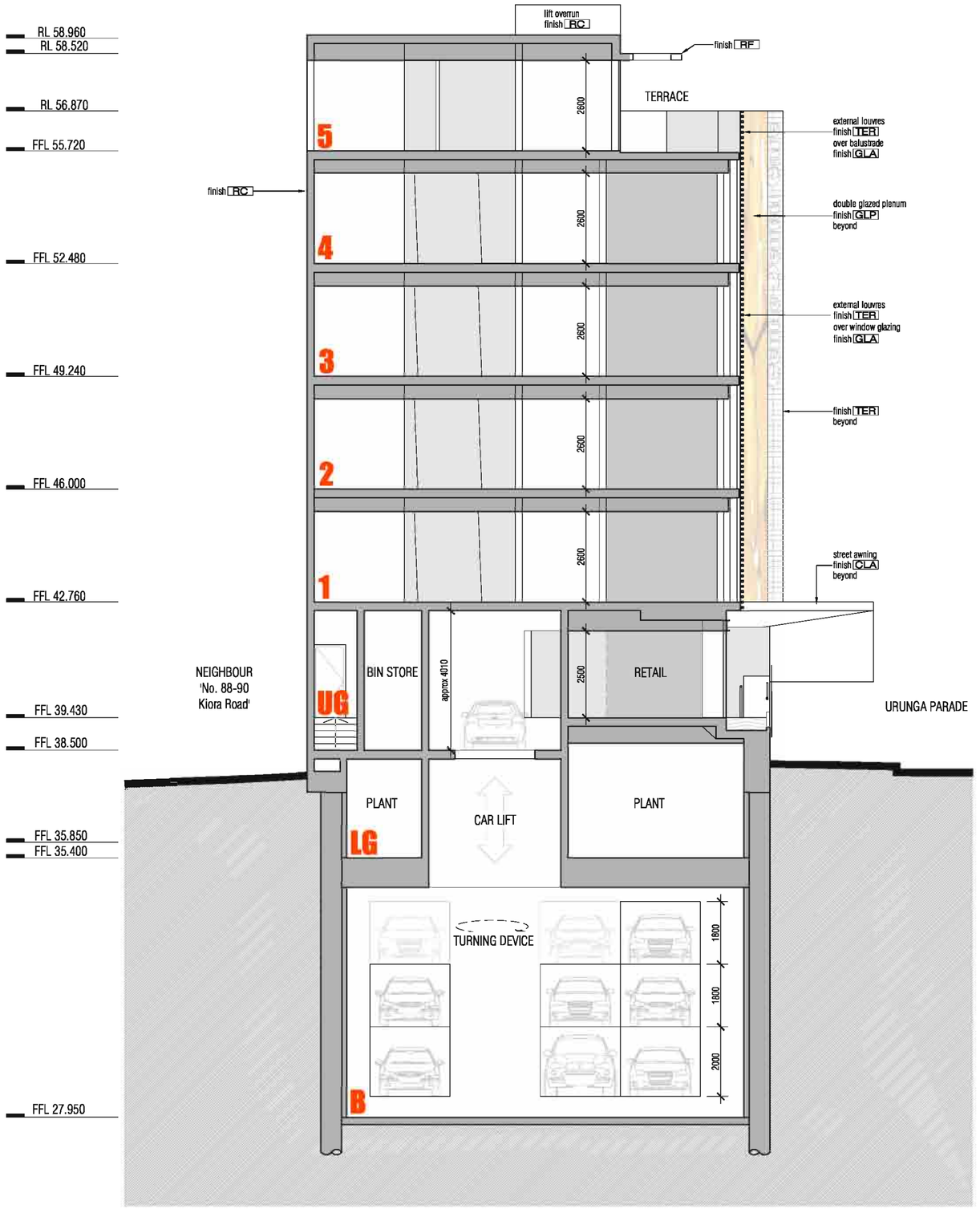
amendments	date	description
3	11/05/2011	issued to all consultants

title : :

0 1 2 3 4 5 10m

job # : : 0903
scale : : 1:100 @ A1
date : : December 2010

drawing number : : **3.03**
issue : : 3



section A
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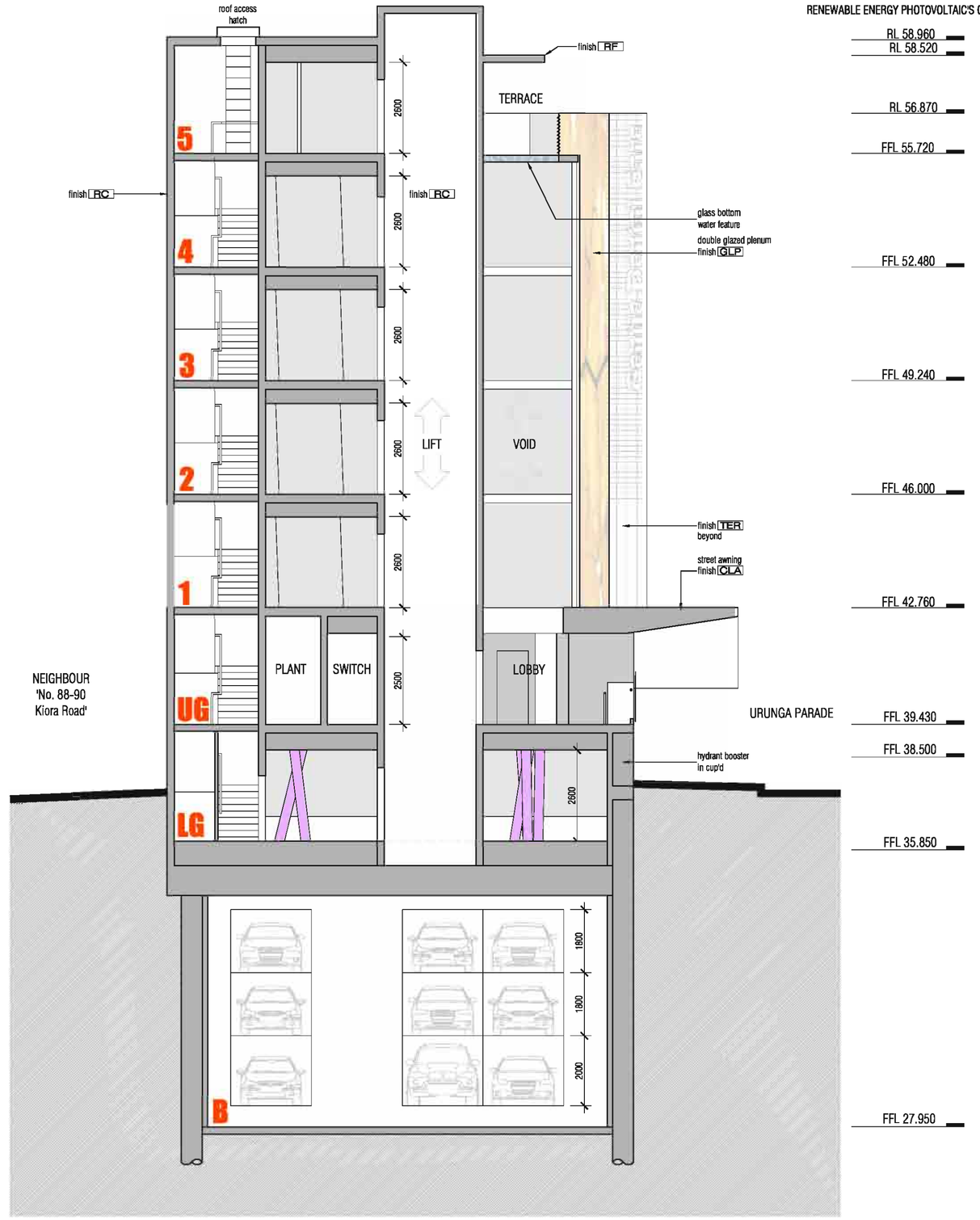

section B
scale: 1:100

GREEN PRINCIPLES

NATURAL VENTILATION
automated operable window system
fire stair and lift core adapted as solar exhaust chimneys
night purging

FEATURE DOUBLE GLAZED VENTILATED FACADE
plenum to utilise stack effect ventilation
floors 1 thru 4

FEATURE STACK EFFECT VENTILATION VIA GLAZED 'CHIMNEY'
lower ground floor (at north west corner of building)

LOW EMISIVITY DOUBLE GLAZING
throughout

INTELLIGENT BUILDING MANAGEMENT SYSTEM
controlling natural ventilation, window openings, heating, cooling, solar chimneys, security & lighting.

RENEWABLE ENERGY PHOTOVOLTAIC'S ON ROOF

THERMAL MASS CONSTRUCTION
polished concrete floors and precast concrete walls to improve summer and winter comfort

LOW TOXIC FINISHES

RAINWATER CAPTURE & STORAGE
for reuse in sanitary facilites watering of plants and washing down of hard surfaces

WATER EFFICIENT FIXTURES & FITTINGS

MAXIMISED NATURAL DAYLIGHTING
with low energy light fittings

SOLAR HOT WATER UNITS

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by VIM Sustainability

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townplanner: David Crane & Associates, ph. 02 9698 9865, fax. 02 9319 1283
bca: Vic Lilli & Partners, ph. 02 9715 2555, fax. 02 9715 2333
sustainability: VIM construction & sustainability, ph. 02 9557 5122, fax. 02 9557 5133
structural: Birzulis Associates, ph. 02 9555 7230, fax. 02 9555 7239
hydraulic: EWFW, ph. 02 9212 1000, fax. 02 9212 1001
traffic: Traffix, ph. 02 9211 3352, fax. 02 9211 2740
surveyor: John R Holt surveyors, ph. 02 9523 2599, fax. 02 9527 4172

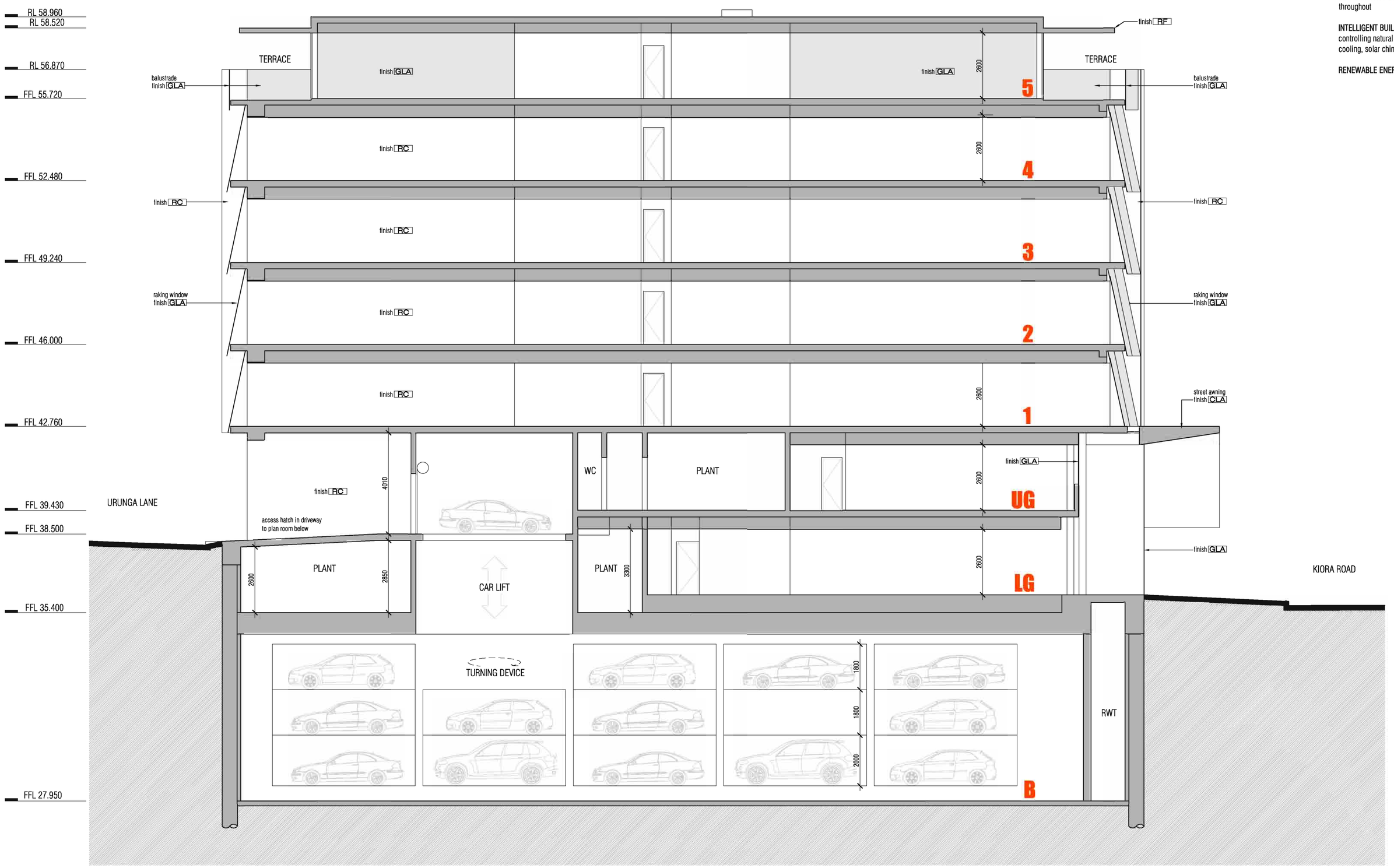
amendments	date	description
3	11/05/2011	issued to all consultants

title : : **SECTIONS A & B**

0 1 2 3 4 5 10m

job # : : 0903
scale : : 1:100 @ A1
date : : Decemeber 2010

drawing number : : 4.01
issue : : 3



section C
scale: 1:100

GREEN PRINCIPLES

NATURAL VENTILATION
automated operable window system
fire stair and lift core adapted as solar exhaust chimneys
night purging

FEATURE DOUBLE GLAZED VENTILATED FACADE
plenum to utilise stack effect ventilation
floors 1 thru 4

FEATURE STACK EFFECT VENTILATION VIA GLAZED 'CHIMNEY'
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LOW EMISIVITY DOUBLE GLAZING
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RENEWABLE ENERGY PHOTOVOLTAIC'S ON ROOF

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SOLAR HOT WATER UNITS

REFER TO ENVIRONMENTAL SUSTAINABILITY DESIGN REPORT by VIM Sustainability

FINISHES SCHEDULE

CODE	DESCRIPTION
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townplanner: David Crane & Associates, ph. 02 9698 9865, fax. 02 9319 1283
bca: Vic Lilli & Partners, ph. 02 9715 2555, fax. 02 9715 2333
sustainability: VIM construction & sustainability, ph. 02 9557 5122, fax. 02 9557 5133
structural: Birzulis Associates, ph. 02 9555 7230, fax. 02 9555 7239
hydraulic: EWFW, ph. 02 9212 1000, fax. 02 9212 1001
traffic: Traffix, ph. 02 9211 3352, fax. 02 9211 2740
surveyor: John R Holt surveyors, ph. 02 9523 2589, fax. 02 9527 4172

amendments	date	description
3	11/05/2011	issued to all consultants

title : : SECTION C

0 1 2 3 4 5 10m

job # : : 0903
scale : : 1:100 @ A1
date : : December 2010

drawing number : : 4.02
issue : : 3

GREEN PRINCIPLES

NATURAL VENTILATION
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fire stair and lift core adapted as solar exhaust chimneys
night purging

FEATURE DOUBLE GLAZED VENTILATED FACADE
plenum to utilise stack effect ventilation
floors 1 thru 4

FEATURE STACK EFFECT VENTILATION VIA GLAZED 'CHIMNEY'
lower ground floor (at north west corner of building)

LOW EMISIVITY DOUBLE GLAZING
throughout

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RENEWABLE ENERGY PHOTOVOLTAIC'S ON ROOF

THERMAL MASS CONSTRUCTION
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LOW TOXIC FINISHES

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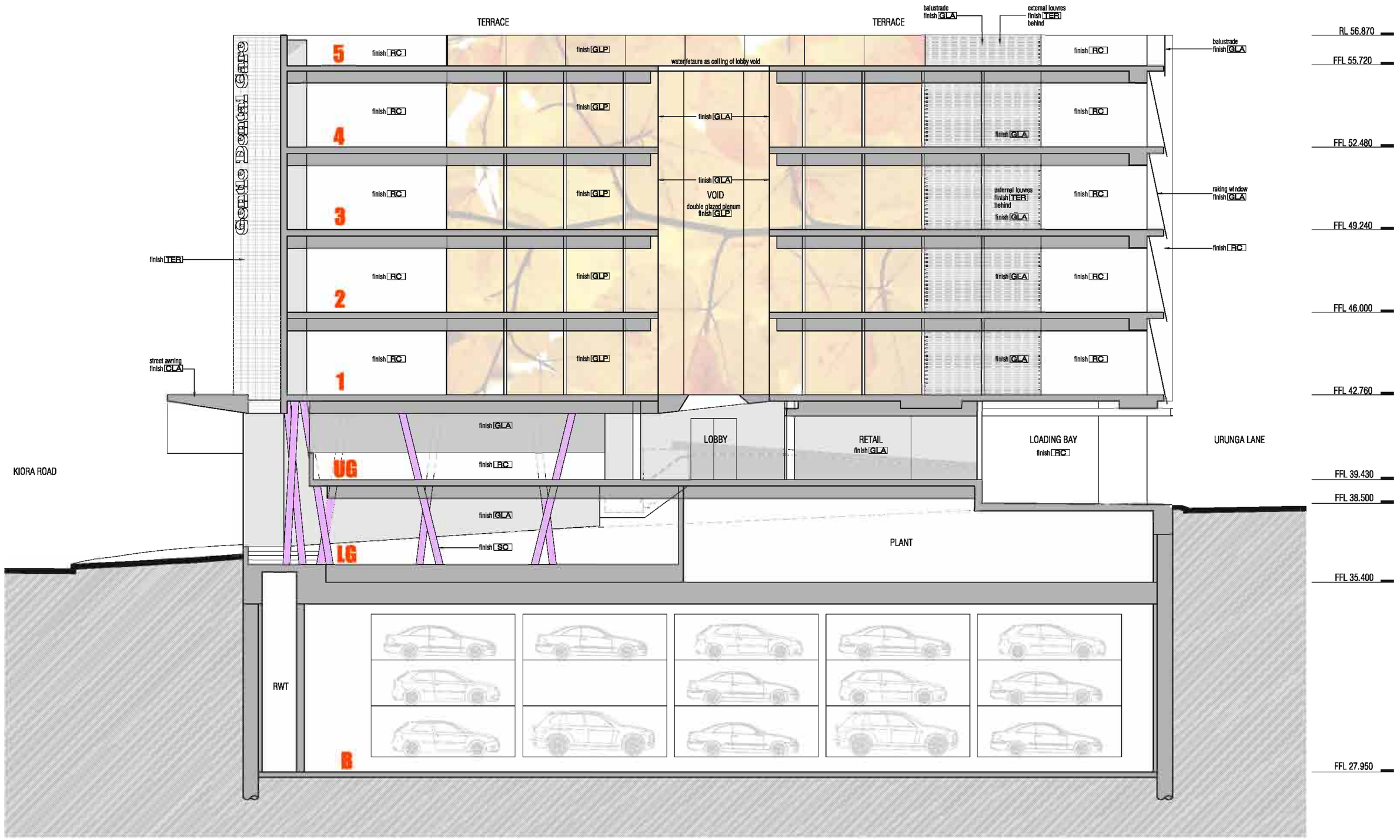
WATER EFFICIENT FIXTURES & FITTINGS

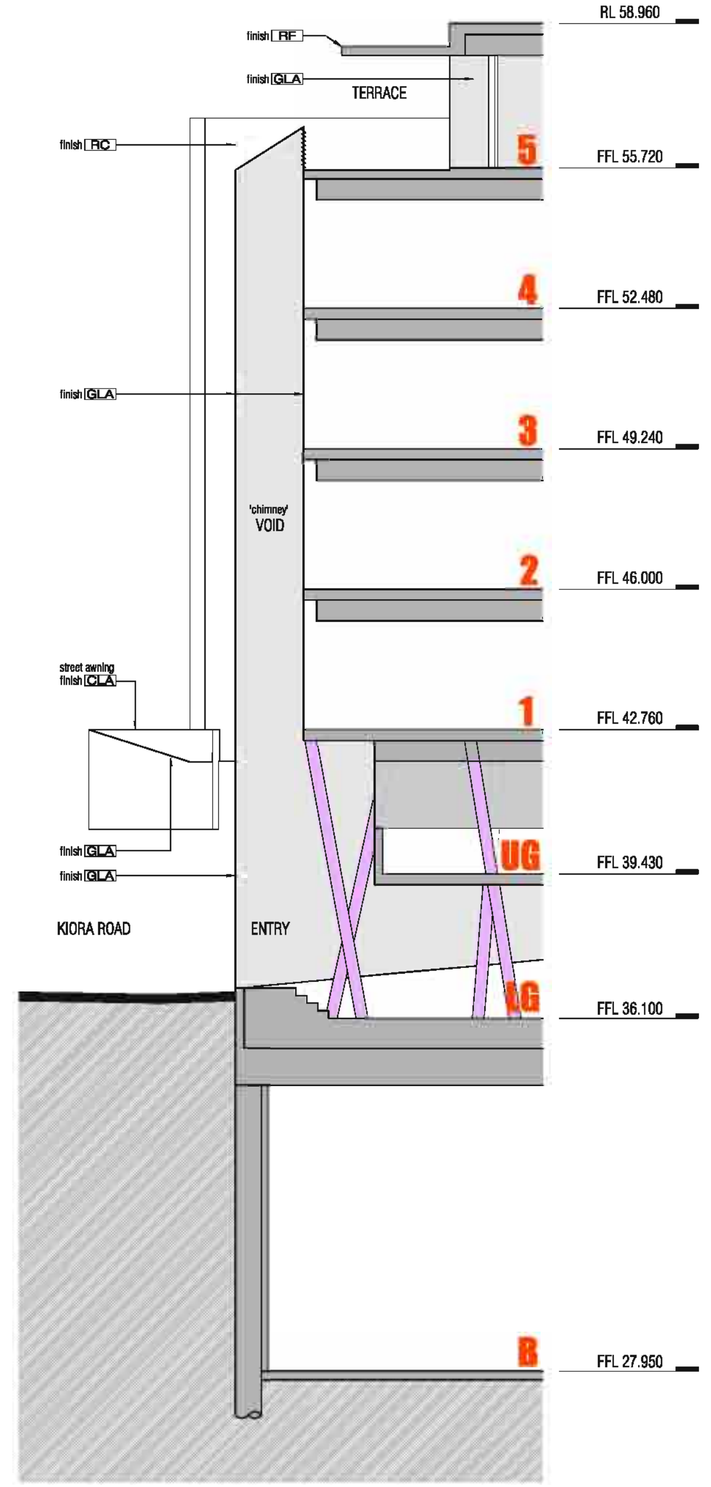
MAXIMISED NATURAL DAYLIGHTING
with low energy light fittings

SOLAR HOT WATER UNITS

REFER TO ENVIRONMENTAL SUSTAINABILITY DESIGN REPORT
by VIM Sustainability



section D
scale: 1:100



section E
scale: 1:100

FINISHES SCHEDULE

CODE	DESCRIPTION
BAL	toughened clear glass balustrade.
CLA	steel framed cantilevered street awning with prefinished metal cladding all round.
DGL	low-e double glazed and ventilated plenum with digital printed image on glazing interlayer.
GLA	low-e double glazed alum windows, awnings and skylights
PFC	mild steel PFC with MIO paint finish. colour: charcoal
RC	off-form / precast concrete walls.
RF	off form concrete roof and awning.
SC	core-filled MS CHS column. paint finish: purple
TER	terracotta ventilated facade system over insulation and off-form structural concrete walls.
TER	terracotta external louvres, to match ventilated facade adjacent, over low-e glazed windows.

MIRANDA DENTAL HOSPITAL - 84-86 KIORA ROAD, MIRANDA NSW 2228

geoformdesignarchitects ©
design + architecture + interiors
moore park gardens, suite 145-H 780 bourke street redfern nsw 2016
T : : 9699 4499 F : : 9699 4599
E : : architecture@geoform.com.au W : : www.geoform.com.au

applicant	townplanner	bca	sustainability	structural	hydraulic	traffic	surveyor
David Crane & Associates ph. 02 9698 9865 fax. 02 9319 1283	David Crane & Associates ph. 02 9698 9865 fax. 02 9319 1283	Vic Lilli & Partners ph. 02 9715 2555 fax. 02 9715 2333	VIM construction & sustainability ph. 02 9557 5122 fax. 02 9557 5133	Birzulis Associates ph. 02 9555 7230 fax. 02 9555 7239	EWFW ph. 02 9212 1000 fax. 02 9212 1001	Traffix ph. 02 9211 3362 fax. 02 9211 2740	John R Holt surveyors ph. 02 9523 2599 fax. 02 9527 4172

amendments	date	description
3	11/05/2011	Issued to all consultants

SECTIONS D & E

title : :
0 1 2 3 4 5 10m
job # : : 0903
scale : : 1:100 @ A1
date : : Decemeber 2010

drawing number : : 4.03
issue : : 3

APPENDIX B
QUALITY ASSURANCE / QUALITY CONTROL

Table QC1 - Containers, Preservation Requirements and Holding Times - Soil			
Parameter	Container	Preservation	Maximum Holding Time
Acid digestible metals and metalloids - Total and TCLP (As,Cd.,Cu,Cr,Ni,Pb,Zn)	Glass with Teflon Lid	Nil	6 months
Mercury	Glass with Teflon Lid	Nil	28 days
TPH / BTEX / VOC / SVOC / CHC	Glass with Teflon Lid	4°C, zero headspace	14 days
PAHs (total and TCLP)	Glass with Teflon Lid	4°C [1]	14 days
Phenols	Glass with Teflon Lid	4°C [1]	14 days
OCPs, OPPs and total PCBs	Glass with Teflon Lid	4°C [1]	14 days
Asbestos	Sealed Plastic Bag	Nil	N/A

Table QC2 - Containers, Preservation Requirements and Holding Times - Water			
Parameter	Container Volume (mL)	Preservation	Maximum Holding Time
Heavy Metals	125mL Plastic	Field filtration 0.45μm HNO_3 / 4°C	6 months
Cyanide	125mL Amber Glass	pH > 12 NaOH / 4°C	6 months
TPH (C6-C9) / BTEX / VOCs SVOCs / CHCs	4 x 43mL Glass	HCl / 4°C [1]	14 days
TPH (C10-C36) / PAH / Phenolics OCP / OPP / TDS / pH	3 x 1L Amber Glass	None / 4°C [1]	28 days

Notes: [1] = Extraction within 14 days, Analysis within 40 days.

Table QC3 - Analytical Parameters, PQLs and Methods - Soil			
Parameter	**Unit**	**PQL**	**Method Reference**
Metals in Soil			
Arsenic - As[1]	mg / kg	1	USEPA 200.7
Cadmium - Cd[1]	mg / kg	0.5	USEPA 200.7
Chromium - Cr[1]	mg / kg	1	USEPA 200.7
Copper - Cu[1]	mg / kg	1	USEPA 200.7
Lead - Pb[1]	mg / kg	1	USEPA 200.7
Mercury - Hg[2]	mg / kg	0.1	USEPA 7471A
Nickel - Ni[1]	mg / kg	1	USEPA 200.7
Zinc - Zn[1]	mg / kg	1	USEPA 200.7
Total Petroleum Hydrocarbons (TPHs) in Soil			
C_6-C_9 fraction	mg / kg	25	USEPA 8260
C_{10}-C_{14} fraction	mg / kg	50	USEPA 8000
C_{15}-C_{28} fraction	mg / kg	100	USEPA 8000
C_{29}-C_{36} fraction	mg / kg	100	USEPA 8000
BTEX in Soil			
Benzene	mg / kg	1	USEPA 8260
Toluene	mg / kg	1	USEPA 8260
Ethylbenzene	mg / kg	1	USEPA 8260
m & p Xylene	mg / kg	2	USEPA 8260
o- Xylene	mg / kg	1	USEPA 8260
Other Organic Contaminants in Soil			
PAHs	mg / kg	0.05-0.2	USEPA 8270
CHCs	mg / kg	1	USEPA 8260
VOCs	mg / kg	1	USEPA 8260
SVOCs	mg / kg	1	USEPA 8260
OCPs	mg / kg	0.1	USEPA 8140, 8080
OPPs	mg / kg	0.1	USEPA 8140, 8080
PCBs	mg / kg	0.1	USEPA 8080
Phenolics	mg / kg	5	APHA 5530
Asbestos			
Asbestos	mg / kg	Presence / Absence	AS4964-2004

Notes:

1. Acid Soluble Metals by ICP-AES
2. Total Recoverable Mercury

Table QC4 - Analytical Parameters, PQLs and Methods - Groundwater

Parameter	Unit	PQL	Method
Heavy Metals			
Antimony - Sb	µg/L	1	USEPA 200.8
Arsenic - As	µg/L	1	USEPA 200.8
Beryllium - Be	µg/L	0.5	USEPA 200.8
Cadmium - Cd	µg/L	0.1	USEPA 200.8
Chromium - Cr	µg/L	1	USEPA 200.8
Cobalt - Co	µg/L	1	USEPA 200.8
Copper - Cu	µg/L	1	USEPA 200.8
Lead - Pb	µg/L	1	USEPA 200.8
Mercury - Hg	µg/L	0.5	USEPA 7471A
Molybdenum - Mo	µg/L	1	USEPA 200.8
Nickel - Ni	µg/L	1	USEPA 200.8
Selenium - Se	µg/L	1	USEPA 200.8
Silver - Ag	µg/L	1	USEPA 200.8
Tin (inorg.) - Sn	µg/L	1	USEPA 200.8
Nickel - Ni	µg/L	1	USEPA 200.8
Zinc - Zn	µg/L	1	USEPA 200.8
Total Petroleum Hydrocarbons (TPHs)			
C_6-C_9 fraction	µg/L	10	USEPA 8220A / 8000
C_{10}-C_{14} fraction	µg/L	50	USEPA 8000
C_{15}-C_{28} fraction	µg/L	100	USEPA 8000
C_{29}-C_{36} fraction	µg/L	100	USEPA 8000
BTEX			
Benzene	µg/L	1	USEPA 8220A
Toluene	µg/L	1	USEPA 8220A
Ethylbenzene	µg/L	1	USEPA 8220A
m- & p-Xylene	µg/L	2	USEPA 8220A
o-Xylene	µg/L	1	USEPA 8220A
Polyciclic Aromatic Hydrocarbons (PAHs)			
PAHs	µg/L	0.1	USEPA 8270
Benzo(a)pyrene	µg/L	0.01	USEPA 8270
OrganoChlorine Pesticides (OCPs)			
Aldrin	µg/L	0.001	USEPA 8081
Chlordane	µg/L	0.001	USEPA 8081
DDT	µg/L	0.001	USEPA 8081
Dieldrin	µg/L	0.001	USEPA 8081
Endosulfan	µg/L	0.001	USEPA 8081
Endrin	µg/L	0.001	USEPA 8081
Heptachlor	µg/L	0.001	USEPA 8081
Lindane	µg/L	0.001	USEPA 8081
Toxaphene	µg/L	0.001	USEPA 8081

Parameter	Unit	PQL	Method
Chlorinated Hydrocarbons (CHCs)			
1,2-dichlorobenzene	µg/L	1	USEPA 8260B
1,3-dichlorobenzene	µg/L	1	USEPA 8260B
1,4-dichlorobenzene	µg/L	1	USEPA 8260B
1,2,3-trichlorobenzene	µg/L	1	USEPA 8260B
1,2,4-trichlorobenzene	µg/L	1	USEPA 8260B
Hexachlorobutadeine	µg/L	1	USEPA 8260B
1,1,2-trichloroethane	µg/L	1	USEPA 8260B
Hexachloroethane	µg/L	10	USEPA 8270D
Other CHCs	µg/L	1	USEPA 8260B
Volatile Organic Compounds (VOCs)			
Aniline	µg/L	10	USEPA 8260B
2,4-dichloroaniline	µg/L	10	USEPA 8260B
3,4-dichloroaniline	µg/L	10	USEPA 8260B
Nitrobenzene	µg/L	50	USEPA 8260B
2,4-dinitrotoluene	µg/L	50	USEPA 8260B
2,4,6-trinitrotoluene	µg/L	50	USEPA 8260B
Phenolic Compounds			
Phenol	µg/L	10	USEPA 8041
2-chlorophenol	µg/L	10	USEPA 8041
4-chlorophenol	µg/L	10	USEPA 8041
2, 4-dichlorophenol	µg/L	10	USEPA 8041
2,4,6-trichlorophenol	µg/L	10	USEPA 8041
2,3,4,6-tetrachlorophenol	µg/L	10	USEPA 8041
Pentachlorophenol	µg/L	10	USEPA 8041
2,4-dinitrophenol	µg/L	10	USEPA 8041
Miscellaneous Parameters			
Total Cyanide	µg/L	5	APHA 4500C&E-CN
Fluoride	µg/L	10	APHA 4500 F-C
Salinity (TDS)	mg/L	1	APHA 2510
pH	units	0.1	APHA 4500H+
OrganoPhosphate Pesticides (OPPs)			
Azinphos Methyl	µg/L	0.01	USEPA 8141
Chloropyrifos	µg/L	0.01	USEPA 8141
Diazinon	µg/L	0.01	USEPA 8141
Dimethoate	µg/L	0.01	USEPA 8141
Fenitrothion	µg/L	0.01	USEPA 8141
Malathion	µg/L	0.01	USEPA 8141
Parathion	µg/L	0.01	USEPA 8141
Temephos	µg/L	0.01	USEPA 8141
Polychlorinated Biphenyls (PCBs)			
Individual PCBs	µg/L	0.01	USEPA 8081

Table QC5 - QC Sample Data Acceptance Criteria

QC Sample Type	Method of Assessment	Acceptable Range
Field QC		
Blind Duplicates and Split Samples	The assessment of split duplicate is undertaken by calculating the Relative Percent Difference (RPD) of the duplicate concentration compared with the primary sample concentration. The RPD is defined as: $RPD = 100 \times \frac{\lvert X_1 - X_2 \rvert}{\text{mean}(X1, X2)}$ Where: X_1 and X_2 are the concentrations of the primary and duplicate samples.	The acceptable range depends upon the levels detected: - 0-150% RPD (when the average concentration is <5 times the LOR/PQL) - 0-75% RPD (when the average concentration is 5 to 10 times the LOR/PQL) - 0-50% RPD (when the average concentration is >10 times the LOR/PQL)
Rinsate & Trip Blanks	Each blank is analysed as per the original samples.	Analytical Result <LOR/PQL
Laboratory prepared Trip Spike	The Trip Spike is analysed after returning from the field and the % recovery of the known spike is calculated.	70 - 130%
Laboratory QC		
Laboratory Duplicates	Assessment of Lab Duplicate RPD as per Blind Duplicates and Split Samples.	Lab Duplicate RPD < 15% (Inorganics) Lab Duplicate RPD < 30% (Organics) for sample results > 10 LOR
Surrogates Matrix Spikes Laboratory Control Samples	Assessment is undertaken by determining the percent recovery of the known surrogate spike (SS) or addition to the sample. $\%\ \text{Recovery} = 100 \times \frac{C - A}{B}$ Where: A = Concentration of analyte determined in the original sample; B = Added Concentration; and C = Calculated Concentration.	at least 2 SS recoveries to be within 70-130% subject to matrix effects (Organics) 80-120% (Inorganics / Metals) 60-140% (Organics) 10-140% (SVOC and Speciated Phenols) If the result is outside the above ranges, the result must be <3x Standard Deviation of the Historical Mean (calculated over the past 12 months).
Sample Matrix Spike Duplicates	Recovery RPD	<30% (Inorganics & Organics)
Calibration Check Standards	Continuous Calibration Verification (CCV)	CCV must be within ±15% (inorganics) CCV must be within ±25% (inorganics)
Reagent, Method & Calibration Check Blanks	Each blank is analysed as per the original samples.	Analytical Result <LOR/PQL

Note: PQL - Laboratory Practical Quantitation Limit (PQL) or the minimum detection limit for a particular analyte.
LOR = Limit of Reporting

APPENDIX C
BOREHOLE LOGS

Environmental Investigations
Contamination Assessment Management & Geotechnical
PO Box 215
ST PETERS NSW 2044
Ph: (02) 9516-0722 Fax: (02) 9516-0741

Borehole: BH1

Project No: E1481.1
Site Address: 84-86 Kiora Rd., Miranda NSW
Client: COMSERV No 462 Pty Ltd
Drill Method: Direct Push Tube
Drill date: 8-11-2011

Sheet: 1 of 1
Hole size: 50mm
Engineer: D.H.
Checked by: V.J.

SUBSURFACE PROFILE

Depth (m)	Symbol	Description	Sample ID	PID Concentration (ppm)	FCR
0.00		Ground Surface			
		Asphalt			
		Fill Grey-grey/orange gravelly sand with clay, fine to medium grained, medium dense, moist, no odour	BH1-1		0
0.60		***Clay*** Red/grey-light grey/orange mottled, moderate to high plasticity, very stiff, moist, no odour	BH1-2		0
1.80		***Sandstone*** Orange/grey-grey, extremely weathered, fine to medium grained, moist	BH1-3		0
2.00		Borehole ended at 2m			

FCR = FIELD CONTAMINATION RANKING

0 = No visual signs of contamination and/or detectable odours
1 = Slight visual signs of contamination and/or odours
2 = Obvious visual signs of contamination and/or odour
3 = Strong visual signs of contamination and/or odour

Environmental Investigations
Contamination Assessment Management & Geotechnical

PO Box 215
ST PETERS NSW 2044
Ph: (02) 9516-0722 Fax: (02) 9516-0741

Borehole: BH2

Project No: E1481.1
Site Address: 84-86 Kiora Rd., Miranda NSW
Client: COMSERV No 462 Pty Ltd
Drill Method: Direct Push Tube
Drill date: 8-11-2011

Sheet: 1 of 1
Hole size: 50mm
Engineer: D.H.
Checked by: V.J.

SUBSURFACE PROFILE

Depth (m)	Symbol	Description	Sample ID	PID Concentration (ppm)	FCR
0.00		Ground Surface			
		Asphalt			
		Fill Grey-grey/orange gravelly sand with clay and minor crushed concrete fragments, fine to medium grained, medium dense, moist, no odour	BH2-1		0
0.40					
		Clay Red/grey-light grey/orange mottled, moderate to high plasticity, very stiff, moist, no odour	BH2-2		0
0.60					
0.80					
1.00					
1.20					
1.40					
1.60		***Sandstone*** Orange/grey-grey, extremely weathered, fine to medium grained, moist			
1.80					
2.00			BH2-3		0
2.20					
2.40					
2.60		Borehole ended at 2.55m			

FCR = FIELD CONTAMINATION RANKING

0 = No visual signs of contamination and/or detectable odours
1 = Slight visual signs of contamination and/or odours
2 = Obvious visual signs of contamination and/or odour
3 = Strong visual signs of contamination and/or odour

Environmental Investigations
Contamination Assessment Management & Geotechnical

PO Box 215
ST PETERS NSW 2044
Ph: (02) 9516-0722 Fax: (02) 9516-0741

Borehole: BH3

Project No: E1481.1
Site Address: 84-86 Kiora Rd., Miranda NSW
Client: COMSERV No 462 Pty Ltd
Drill Method: Direct Push Tube
Drill date: 8-11-2011

Sheet: 1 of 1
Hole size: 50mm
Engineer: D.H.
Checked by: V.J.

SUBSURFACE PROFILE

Depth (m)	Symbol	Description	Sample ID	PID Concentration (ppm)	FCR
0.00		Ground Surface			
		Asphalt			
		Fill Grey-grey/orange gravelly sand with clay and minor brick and concrete fragments fine to medium grained, medium dense, moist, no odour	BH3-1		0
0.40					
		Clay Red/grey-light grey/orange mottled, moderate to high plasticity, very stiff, moist, no odour	BH3-2		0
0.60					
0.80					
1.00					
1.20					
1.40					
1.60					
1.80		***Sandstone*** Orange/grey-grey, extremely weathered, fine to medium grained, moist			
2.00			BH3-3		0
2.20		Borehole ended at 2.15m			

FCR = FIELD CONTAMINATION RANKING

0 = No visual signs of contamination and/or detectable odours
1 = Slight visual signs of contamination and/or odours
2 = Obvious visual signs of contamination and/or odour
3 = Strong visual signs of contamination and/or odour

Environmental Investigations
Contamination Assessment Management & Geotechnical

PO Box 215
ST PETERS NSW 2044
Ph: (02) 9516-0722 Fax: (02) 9516-0741

Borehole: BH4

Project No: E1481.1
Site Address: 84-86 Kiora Rd., Miranda NSW
Client: COMSERV No 462 Pty Ltd
Drill Method: Direct Push Tube
Drill date: 8-11-2011

Sheet: 1 of 1
Hole size: 50mm
Engineer: D.H.
Checked by: V.J.

SUBSURFACE PROFILE

Depth (m)	Symbol	Description	Sample ID	PID Concentration (ppm)	FCR
0.00		Ground Surface			
		Asphalt			
		Fill Grey-grey/orange gravelly sand with clay and crashed concrete fragments, fine to medium grained, medium dense, moist, no odour	BH4-1		0
0.40		***Clay*** Red/grey-light grey/orange mottled, moderate to high plasticity, very stiff, moist, no odour	BH4-2		0
0.60					
0.80					
1.00					
1.20					
1.40					
1.60		***Sandstone*** Orange/grey-grey, extremely weathered, fine to medium grained, moist			
1.80			BH4-3		0
2.00					
		Borehole ended at 2.05m			

FCR = FIELD CONTAMINATION RANKING

0 = No visual signs of contamination and/or detectable odours
1 = Slight visual signs of contamination and/or odours
2 = Obvious visual signs of contamination and/or odour
3 = Strong visual signs of contamination and/or odour

Environmental Investigations
Contamination Assessment Management & Geotechnical

PO Box 215
ST PETERS NSW 2044
Ph: (02) 9516-0722 Fax: (02) 9516-0741

Borehole: BH5

Project No: E1481.1
Site Address: 84-86 Kiora Rd., Miranda NSW
Client: COMSERV No 462 Pty Ltd
Drill Method: Direct Push Tube
Drill date: 8-11-2011

Sheet: 1 of 1
Hole size: 50mm
Engineer: D.H.
Checked by: V.J.

SUBSURFACE PROFILE

Depth (m)	Symbol	Description	Sample ID	PID Concentration (ppm)	FCR
0.00		Ground Surface			
		Asphalt			
		Fill Grey-grey/orange gravelly sand with clay and minor brick fragments, fine to medium grained, medium dense, moist, no odour	BH5-1		0
0.40					
		Clay Red/grey-light grey/orange mottled, moderate to high plasticity, very stiff, moist, no odour	BH5-2		0
1.80		***Sandstone*** Orange/grey-grey, extremely weathered, fine to medium grained, moist	BH5-3		0
2.20		Borehole ended at 2.15m			

FCR = FIELD CONTAMINATION RANKING

0 = No visual signs of contamination and/or detectable odours
1 = Slight visual signs of contamination and/or odours
2 = Obvious visual signs of contamination and/or odour
3 = Strong visual signs of contamination and/or odour

APPENDIX D
SAMPLE RECEIPT ADVICE
&
CHAIN-OF-CUSTODY CERTIFICATES

Sheet 1 of 2

Site: 84-86 Kiora Rd. Miranda NSW

Project ID: E1481.1

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Environmental Investigations
Contamination Assessment Management & Geotechnical
17/1A Coulson Street,
ERSKINEVILLE NSW 2043
PO Box 215
ST PETERS NSW 2044
Ph: 9516 0722
Fx: 9516 0741
service@eiaustralia.com.au

Sample ID	Laboratory ID	Container Type	Sampling Date:	Sampling Time:	Sample Matrix: WATER	SOIL	COMPOSITE	OTHER	Heavy Metals Δ	Heavy Metals B	TPH / BTEX	PAHs	OCPs / PCBs / OPPs	TPH (C_{10} - C_{36}) only	Asbestos	VOCs	sPOCAs	pH (1:5)	EC (1:5)	Peroxid PH
BH1-1	1	J	8.11.11	1100		✓	C1		✓		✓	✓								
BH1-2						✓														
BH 1-3						✓														
BH 2-1	2					✓	C1		✓		✓	✓								
BH 2-2						✓														
BH 2-3						✓														
BH 3-1	3					✓	C2		✓		✓	✓								
BH 3-2						✓														
BH 3-3						✓														
BH 4-1	4					✓	C2		✓		✓	✓								
BH 4-2						✓														
BH 4-3						✓														
BH5-1	5	↓	↓	↓		✓	C2		✓		✓	✓								

SGS
Received SB 09/11/11
Time 1:25 PM
Samples Intact
Esky/Cooler Pack
Temperature on Receipt 2.7°C
Storage Location
SE SB11-2, WO 47 ASS
SE 103158

Comments:

Δ Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc

B Antimony, Barium, Beryllium, Cobalt, Manganese, Tin, Vanadium

Laboratory Turnaround:

- ☐ Same Day ☐ 24 Hours
- ☐ 48 Hours ☒ 72 Hours
- ☐ Standard
- ☐ Other _____

Investigator: *I attest that these samples were collected in accordance with standard EI field sampling procedures.*

Sampler Name: Anthony Barkway (Print) A Barkway (Signature) Date: 9.11.11

Sampler's Comments:

72 HRS TURN AROUND !!!

Received by: (print & Signature) Date: 09/11 Time: 1.25

IMPORTANT:
PLEASE E-MAIL LABORATORY RESULTS TO:
service@eiaustralia.com.au

Container Type:
J= solvent washed, acid rinsed, Teflon sealed, glass jar; S= solvent washed, acid rinsed glass bottle;
P= natural HDPE plastic bottle; VC= glass vial, Teflon Septum; ZLB = Zip-Lock Bag

Sheet 2 of 2

Site: 84-86 Kiora Rd. Miranda NSW

Project ID: E4481.1

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date:	Sampling Time:	Sample Matrix: WATER	SOIL	COMPOSITE	OTHER	Heavy Metals [A]	Heavy Metals [B]	TPH / BTEX	PAHs	OCPs / PCBs / OPPs	TPH (C_{10} - C_{36}) only	Asbestos	VOCs	sPOCAs	pH (1:5)	EC (1:5)	Peroxid PH
BH5-2		J	8.11.11	1100		✓														
BH5-3		↓	↓	↓		✓														
B1	6	↓				✓			✓					✓						
R1	7	IXP IXS			✓				✓		✓									
BH1-1	8	ZLB				✓									✓					
BH2-1	9					✓									✓					
BH3-1	10					✓									✓					
BH4-1	11					✓									✓					
BH5-1	12	↓	↓	↓		✓									✓					
C1	13						✓						✓							
C2	14						✓						✓							

Environmental Investigations
Contamination Assessment Management & Geotechnical
17/1A Coulson Street,
ERSKINEVILLE NSW 2043
PO Box 215
ST PETERS NSW 2044
Ph: 9516 0722
Fx: 9516 0741
service@eiaustralia.com.au

Comments:

[A] Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc

[B] Antimony, Barium, Beryllium, Cobalt, Manganese, Tin, Vanadium

Laboratory Turnaround:

- ☐ Same Day
- ☐ 24 Hours
- ☐ 48 Hours
- ☒ 72 Hours
- ☐ Standard
- ☐ Other _____

Investigator: *I attest that these samples were collected in accordance with standard EI field sampling procedures.*

Sampler Name: Anthony Barkway (Print) A Barkway (Signature) Date: 9.11.2011

Sampler's Comments:

72 HRS TURNAROUND!!!

Received by: (print & Signature) Date: 09/11 Time: 1:25

IMPORTANT:

PLEASE E-MAIL LABORATORY RESULTS TO:

service@eiaustralia.com.au

Container Type:
J= solvent washed, acid rinsed, Teflon sealed, glass jar; S= solvent washed, acid rinsed glass bottle;
P= natural HDPE plastic bottle; VC= glass vial, Teflon Septum; ZLB = Zip-Lock Bag

SGS

AUSTRALIA – ENVIRONMENTAL SERVICES SYDNEY – PROFORMA FORM

SAMPLE INFORMATION

Approved: D. Liang

JOB No. SE 103158

Sample No.	P 100ml UP	P 250ml UP	P 500ml UP	P 1L UP	G 100 Amber UP	G 200 Amber UP	G 500 Amber UP	G 1L Amber UP	G 40ml vial Up	G 40ml Vial HCl	P 100ml HCl	G 40ml Vial H2SO4	P 100ml H2SO4	P 250ml H2SO4	G 500ml Amber H2SO4	G 1L H2SO4	P 100/250ml HN03 Total	P 100ml HN03 Filtered	P 250ml NaOH	P 250ml Zn Acetate	Plastic Bag	G 250ml Soil Jar				Sample Matrix	Lab Bottles Supplied By	Comments
1-6																						1				Soil	SGS	Full
7								1										1								water	"	2
8-12																					1					Soil	"	100g
13-14			1	Jar	Composite																							
			10	Soil	Jar	on	hold																					

SAMPLE RECEIPT ADVICE

SE103158

CLIENT DETAILS

Contact	Anthony Barkway
Client	Environmental Investigations
Address	17 / 1A Coulson Street Erskineville NSW 2043
Telephone	02 9516 0722
Facsimile	02 9516 0741
Email	anthony.barkway@eiaustralia.com.au
Project	**E1481.1 - Miranda NSW**
Order Number	(Not specified)
Samples	14

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Wed 9/11/2011
Report Due	Mon 14/11/2011
SGS Reference	**SE103158**

SUBMISSION DETAILS

This is to confirm that 14 samples were received on Wednesday 9/11/2011. Results are expected to be ready by Monday 14/11/2011. Please quote SGS reference SE103158 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	11 Soils, 1 Water	Type of documentation received	COC
Date documentation received	9/11/2011	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	2.7°C
Sample container provider	SGS	Turnaround time requested	Three Days
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

Samples will be held for one month for water samples and two months for soil samples from date of report, unless otherwise instructed.

COMMENTS

Site: 84-86 Kiora Rd, Miranda NSW

SAMPLE RECEIPT ADVICE

SE103158

CLIENT DETAILS

Client	Environmental Investigations	Project	E1481.1 - Miranda NSW

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury in Soil	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in	PCBs in Soil	Total Recoverable Metals in Soil by ICPOES from	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	BH1-1	1	-	-	22	-	7	4	12	6
002	BH2-1	1	-	-	22	-	7	4	12	6
003	BH3-1	1	-	-	22	-	7	4	12	6
004	BH4-1	1	-	-	22	-	7	4	12	6
005	BH5-1	1	-	-	22	-	7	4	12	6
006	B1	1	-	-	-	-	7	4	-	-
013	C1	-	26	13	-	11	-	-	-	-
014	C2	-	26	13	-	11	-	-	-	-

CONTINUED OVERLEAF

The above table represents SGS Environmental Services' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details.
Testing as per this table shall commence immediately unless the client intervenes with a correction.

SAMPLE RECEIPT ADVICE

SE103158

CLIENT DETAILS

Client	Environmental Investigations	Project	E1481.1 - Miranda NSW

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Mercury (dissolved) in Water	Moisture Content	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	BH1-1	-	-	1	-	-	-	-
002	BH2-1	-	-	1	-	-	-	-
003	BH3-1	-	-	1	-	-	-	-
004	BH4-1	-	-	1	-	-	-	-
005	BH5-1	-	-	1	-	-	-	-
006	B1	-	-	1	-	-	-	-
007	R1	-	1	-	7	4	12	6
008	BH1-1_ZLB	2	-	-	-	-	-	-
009	BH2-1_ZLB	2	-	-	-	-	-	-
010	BH3-1_ZLB	2	-	-	-	-	-	-
011	BH4-1_ZLB	2	-	-	-	-	-	-
012	BH5-1_ZLB	2	-	-	-	-	-	-
013	C1	-	-	1	-	-	-	-
014	C2	-	-	1	-	-	-	-

The above table represents SGS Environmental Services' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details.
Testing as per this table shall commence immediately unless the client intervenes with a correction.

Sheet 1 of 1

Site: 84-86 Kiora Rd. Miranda NSW

Project ID: E4481.1

Laboratory: **Envirolab Services**
12 Ashley Street,
CHATSWOOD NSW 2067
P: 02 9910 6200 F: 02 9910 6201

Sample ID	Laboratory ID	Container Type	Sampling Date:	Sampling Time:	Sample Matrix: WATER	SOIL	COMPOSITE	OTHER	Heavy Metals [A]	Heavy Metals [B]	TPH / BTEX	PAHs	OCPs / PCBs / OPPs	TPH (C_{10} - C_{36}) only	Asbestos	VOCs	sPOCAs	pH (1:5)	EC (1:5)	Peroxid PH
I1	1	J	8.11.11	1100		✓			✓					✓						

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 64679

Date Received: 9-11-11
Time Received: 1545
Received by: mp
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Environmental Investigations
Contamination Assessment Management & Geotechnical

17/1A Coulson Street,
ERSKINEVILLE NSW 2043
PO Box 215
ST PETERS NSW 2044
Ph: 9516 0722
Fx: 9516 0741
service@eiaustralia.com.au

Comments:

[A] Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc

[B] Antimony, Barium, Beryllium, Cobalt, Manganese, Tin, Vanadium

Laboratory Turnaround:

- ☐ Same Day ☐ 24 Hours
- ☐ 48 Hours ☐ 72 Hours
- ☒ Standard
- ☐ Other _____

Investigator: *I attest that these samples were collected in accordance with standard EI field sampling procedures.*

Sampler Name: Anthony Barkway (Print) A Barkway (Signature) Date: 9.11.4

Sampler's Comments:

Received by: (print & Signature) MORGAN PHILP mp Date: 9-11-11 Time: 1545

IMPORTANT:
PLEASE E-MAIL LABORATORY RESULTS TO:
service@eiaustralia.com.au

Container Type:
J= solvent washed, acid rinsed, Teflon sealed, glass jar; S= solvent washed, acid rinsed glass bottle; P= natural HDPE plastic bottle; VC= glass vial, Teflon Septum; ZLB = Zip-Lock Bag

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

Environmental Investigations
17/1A Coulson St
Erskineville NSW 2043

ph: 9516 0722
Fax: 9516 0741

Attention: Anthony Barkaway

Sample log in details:

Your reference:	**E1481.1, Miranda**
Envirolab Reference:	**64679**
Date received:	09/11/11
Date results expected to be reported:	**16/11/11**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 soil
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice Pack

Comments:

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

APPENDIX E

LABORATORY ANALYTICAL REPORTS

ANALYTICAL REPORT

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Anthony Barkway	Manager	Huong Crawford
Client	Environmental Investigations	Laboratory	SGS Alexandria Environmental
Address	17 / 1A Coulson Street Erskineville NSW 2043	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	02 9516 0722	Telephone	+61 2 8594 0400
Facsimile	02 9516 0741	Facsimile	+61 2 8594 0499
Email	anthony.barkway@eiaustralia.com.au	Email	au.environmental.sydney@sgs.com
Project	**E1481.1 - Miranda NSW**	SGS Reference	SE103158 R0
Order Number	(Not specified)	Report Number	0000011653
Samples	14	Date Reported	14 Nov 2011
		Date Received	09 Nov 2011

COMMENTS

The document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

Site: 84-86 Kiora Rd, Miranda NSW

No respirable fibres detected using trace analysis technique.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

Andy Sutton
Organics Chemist

Dong Liang
Inorganics Metals Team Leader

Huong Crawford
Laboratory Manager

Ravee Sivasubramaniam
Hygienist

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE103158.001 Soil 8/11/11 11:00 BH1-1	SE103158.002 Soil 8/11/11 11:00 BH2-1	SE103158.003 Soil 8/11/11 11:00 BH3-1	SE103158.004 Soil 8/11/11 11:00 BH4-1	SE103158.005 Soil 8/11/11 11:00 BH5-1
VOC's in Soil Method: AN433/AN434								
Monocyclic Aromatic Hydrocarbons								
Benzene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Oxygenated Compounds								
MtBE (Methyl-tert-butyl ether)	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Surrogates								
Dibromofluoromethane (Surrogate)	%	-		**101**	**104**	**97**	**97**	**95**
d4-1,2-dichloroethane (Surrogate)	%	-		**102**	**105**	**99**	**99**	**99**
d8-toluene (Surrogate)	%	-		**99**	**101**	**97**	**95**	**95**
Bromofluorobenzene (Surrogate)	%	-		**99**	**100**	**99**	**99**	**98**
Totals								
Total Xylenes*	mg/kg	0.3		<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	-		**0**	**0**	**0**	**0**	**0**
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434								
TRH C6-C9	mg/kg	20		<20	<20	<20	<20	<20
Surrogates								
Trifluorotoluene (Surrogate)	%	-		**112**	**101**	**129**	**118**	**110**
Dibromofluoromethane (Surrogate)	%	-		-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	-	-	-	-
d8-toluene (Surrogate)	%	-		-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-		-	-	-	-	-
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403								
TRH C10-C14	mg/kg	20		<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	50		<50	<50	<50	<50	<50
TRH C29-C36	mg/kg	50		<50	<50	<50	<50	<50
Surrogates								
TRH (Surrogate)	%	-		-	-	-	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420								
Naphthalene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE103158.001 Soil 8/11/11 11:00 BH1-1	SE103158.002 Soil 8/11/11 11:00 BH2-1	SE103158.003 Soil 8/11/11 11:00 BH3-1	SE103158.004 Soil 8/11/11 11:00 BH4-1	SE103158.005 Soil 8/11/11 11:00 BH5-1
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)								
Benzo(ghi)perylene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Total PAH	mg/kg	0.8		<0.8	<0.8	<0.8	<0.8	<0.8
Surrogates								
d5-nitrobenzene (Surrogate)	%	-		**109**	**101**	**112**	**114**	**111**
2-fluorobiphenyl (Surrogate)	%	-		**92**	**88**	**94**	**97**	**94**
d14-p-terphenyl (Surrogate)	%	-		**110**	**113**	**116**	**120**	**123**
OC Pesticides in Soil Method: AN400/AN420								
Hexachlorobenzene (HCB)	mg/kg	0.1		-	-	-	-	-
Alpha BHC	mg/kg	0.1		-	-	-	-	-
Lindane	mg/kg	0.1		-	-	-	-	-
Heptachlor	mg/kg	0.1		-	-	-	-	-
Aldrin	mg/kg	0.1		-	-	-	-	-
Beta BHC	mg/kg	0.1		-	-	-	-	-
Delta BHC	mg/kg	0.1		-	-	-	-	-
Heptachlor epoxide	mg/kg	0.1		-	-	-	-	-
o,p'-DDE	mg/kg	0.1		-	-	-	-	-
Alpha Endosulfan	mg/kg	0.2		-	-	-	-	-
Gamma Chlordane	mg/kg	0.1		-	-	-	-	-
Alpha Chlordane	mg/kg	0.1		-	-	-	-	-
trans-Nonachlor	mg/kg	0.1		-	-	-	-	-
p,p'-DDE	mg/kg	0.1		-	-	-	-	-
Dieldrin	mg/kg	0.2		-	-	-	-	-
Endrin	mg/kg	0.2		-	-	-	-	-
o,p'-DDD	mg/kg	0.1		-	-	-	-	-
o,p'-DDT	mg/kg	0.1		-	-	-	-	-
Beta Endosulfan	mg/kg	0.2		-	-	-	-	-
p,p'-DDD	mg/kg	0.1		-	-	-	-	-
p,p'-DDT	mg/kg	0.1		-	-	-	-	-
Endosulfan sulphate	mg/kg	0.1		-	-	-	-	-
Endrin Aldehyde	mg/kg	0.1		-	-	-	-	-
Methoxychlor	mg/kg	0.1		-	-	-	-	-
Endrin Ketone	mg/kg	0.1		-	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE103158.001 Soil 8/11/11 11:00 BH1-1	SE103158.002 Soil 8/11/11 11:00 BH2-1	SE103158.003 Soil 8/11/11 11:00 BH3-1	SE103158.004 Soil 8/11/11 11:00 BH4-1	SE103158.005 Soil 8/11/11 11:00 BH5-1
OC Pesticides in Soil Method: AN400/AN420 (continued)								
Surrogates								
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		-	-	-	-	-
OP Pesticides in Soil Method: AN400/AN420								
Dichlorvos	mg/kg	0.5		-	-	-	-	-
Dimethoate	mg/kg	0.5		-	-	-	-	-
Diazinon (Dimpylate)	mg/kg	0.5		-	-	-	-	-
Fenitrothion	mg/kg	0.2		-	-	-	-	-
Malathion	mg/kg	0.2		-	-	-	-	-
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2		-	-	-	-	-
Parathion-ethyl (Parathion)	mg/kg	0.2		-	-	-	-	-
Bromophos Ethyl	mg/kg	0.2		-	-	-	-	-
Methidathion	mg/kg	0.5		-	-	-	-	-
Ethion	mg/kg	0.2		-	-	-	-	-
Azinphos-methyl (Guthion)	mg/kg	0.2		-	-	-	-	-
Surrogates								
2-fluorobiphenyl (Surrogate)	%	-		-	-	-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-	-	-
PCBs in Soil Method: AN400/AN420								
Arochlor 1016	mg/kg	0.2		-	-	-	-	-
Arochlor 1221	mg/kg	0.2		-	-	-	-	-
Arochlor 1232	mg/kg	0.2		-	-	-	-	-
Arochlor 1242	mg/kg	0.2		-	-	-	-	-
Arochlor 1248	mg/kg	0.2		-	-	-	-	-
Arochlor 1254	mg/kg	0.2		-	-	-	-	-
Arochlor 1260	mg/kg	0.2		-	-	-	-	-
Arochlor 1262	mg/kg	0.2		-	-	-	-	-
Arochlor 1268	mg/kg	0.2		-	-	-	-	-
Total PCBs (Arochlors)	mg/kg	1		-	-	-	-	-
Surrogates								
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		-	-	-	-	-
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320								
Arsenic, As	mg/kg	3		**4**	<3	<3	**6**	**7**
Cadmium, Cd	mg/kg	0.3		<0.3	**0.5**	**0.4**	<0.3	**0.3**
Chromium, Cr	mg/kg	0.3		**12**	**11**	**11**	**5.4**	**11**
Copper, Cu	mg/kg	0.5		**28**	**58**	**43**	**7.7**	**28**
Lead, Pb	mg/kg	1		**7**	**3**	**6**	**17**	**7**
Nickel, Ni	mg/kg	0.5		**48**	**120**	**80**	**4.5**	**54**
Zinc, Zn	mg/kg	0.5		**33**	**52**	**48**	**36**	**43**
Mercury in Soil Method: AN312								
Mercury	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05	<0.05

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE103158.001 Soil 8/11/11 11:00 BH1-1	SE103158.002 Soil 8/11/11 11:00 BH2-1	SE103158.003 Soil 8/11/11 11:00 BH3-1	SE103158.004 Soil 8/11/11 11:00 BH4-1	SE103158.005 Soil 8/11/11 11:00 BH5-1
Fibre Identification in soil Method: AN602								
FibreID								
Asbestos Detected	No unit	-		-	-	-	-	-
SemiQuant								
Estimated Fibres	%w/w	0.01		-	-	-	-	-
VOCs in Water Method: AN433/AN434								
Monocyclic Aromatic Hydrocarbons								
Benzene	µg/L	0.5		-	-	-	-	-
Toluene	µg/L	0.5		-	-	-	-	-
Ethylbenzene	µg/L	0.5		-	-	-	-	-
m/p-xylene	µg/L	1		-	-	-	-	-
o-xylene	µg/L	0.5		-	-	-	-	-
Oxygenated Compounds								
MtBE (Methyl-tert-butyl ether)	µg/L	0.5		-	-	-	-	-
Surrogates								
Dibromofluoromethane (Surrogate)	%	-		-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	-	-	-	-
d8-toluene (Surrogate)	%	-		-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-		-	-	-	-	-
Totals								
Total Xylenes	µg/L	1.5		-	-	-	-	-
Total BTEX	µg/L	3		-	-	-	-	-
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434								
TRH C6-C9	µg/L	40		-	-	-	-	-
Surrogates								
Trifluorotoluene (Surrogate)	%	-		-	-	-	-	-
Dibromofluoromethane (Surrogate)	%	-		-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	-	-	-	-
d8-toluene (Surrogate)	%	-		-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-		-	-	-	-	-
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403								
TRH C10-C14	µg/L	100		-	-	-	-	-
TRH C15-C28	µg/L	200		-	-	-	-	-
TRH C29-C36	µg/L	200		-	-	-	-	-
Surrogates								
TRH (Surrogate)	%	-		-	-	-	-	-
Trace Metals (Dissolved) in Water by ICPMS Method: AN318								
Arsenic, As	µg/L	1		-	-	-	-	-
Cadmium, Cd	µg/L	0.1		-	-	-	-	-
Chromium, Cr	µg/L	1		-	-	-	-	-
Copper, Cu	µg/L	1		-	-	-	-	-
Lead, Pb	µg/L	1		-	-	-	-	-
Nickel, Ni	µg/L	1		-	-	-	-	-
Zinc, Zn	µg/L	1		-	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE103158.001 Soil 8/11/11 11:00 BH1-1	SE103158.002 Soil 8/11/11 11:00 BH2-1	SE103158.003 Soil 8/11/11 11:00 BH3-1	SE103158.004 Soil 8/11/11 11:00 BH4-1	SE103158.005 Soil 8/11/11 11:00 BH5-1
Mercury (dissolved) in Water Method: AN311/AN312							
Mercury	mg/L	0.0001	-	-	-	-	-
Moisture Content Method: AN234							
% Moisture	%	0.5	**7.3**	**8.8**	**6.7**	**9.8**	**8.7**

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE103158.006 Soil 8/11/11 11:00 B1	SE103158.007 Water 8/11/11 11:00 R1	SE103158.008 Soil 8/11/11 11:00 BH1-1_ZLB	SE103158.009 Soil 8/11/11 11:00 BH2-1_ZLB	SE103158.010 Soil 8/11/11 11:00 BH3-1_ZLB
VOC's in Soil Method: AN433/AN434							
Monocyclic Aromatic Hydrocarbons							
Benzene	mg/kg	0.1	-	-	-	-	-
Toluene	mg/kg	0.1	-	-	-	-	-
Ethylbenzene	mg/kg	0.1	-	-	-	-	-
m/p-xylene	mg/kg	0.2	-	-	-	-	-
o-xylene	mg/kg	0.1	-	-	-	-	-
Oxygenated Compounds							
MtBE (Methyl-tert-butyl ether)	mg/kg	0.1	-	-	-	-	-
Surrogates							
Dibromofluoromethane (Surrogate)	%	-	-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	-	-
d8-toluene (Surrogate)	%	-	-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-	-	-	-
Totals							
Total Xylenes*	mg/kg	0.3	-	-	-	-	-
Total BTEX*	mg/kg	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434							
TRH C6-C9	mg/kg	20	-	-	-	-	-
Surrogates							
Trifluorotoluene (Surrogate)	%	-	-	-	-	-	-
Dibromofluoromethane (Surrogate)	%	-	-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	-	-
d8-toluene (Surrogate)	%	-	-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-	-	-	-
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403							
TRH C10-C14	mg/kg	20	<20	-	-	-	-
TRH C15-C28	mg/kg	50	<50	-	-	-	-
TRH C29-C36	mg/kg	50	<50	-	-	-	-
Surrogates							
TRH (Surrogate)	%	-	-	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE103158.006 Soil 8/11/11 11:00 B1	SE103158.007 Water 8/11/11 11:00 R1	SE103158.008 Soil 8/11/11 11:00 BH1-1_ZLB	SE103158.009 Soil 8/11/11 11:00 BH2-1_ZLB	SE103158.010 Soil 8/11/11 11:00 BH3-1_ZLB
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420								
Naphthalene	mg/kg	0.1		-	-	-	-	-
2-methylnaphthalene	mg/kg	0.1		-	-	-	-	-
1-methylnaphthalene	mg/kg	0.1		-	-	-	-	-
Acenaphthylene	mg/kg	0.1		-	-	-	-	-
Acenaphthene	mg/kg	0.1		-	-	-	-	-
Fluorene	mg/kg	0.1		-	-	-	-	-
Phenanthrene	mg/kg	0.1		-	-	-	-	-
Anthracene	mg/kg	0.1		-	-	-	-	-
Fluoranthene	mg/kg	0.1		-	-	-	-	-
Pyrene	mg/kg	0.1		-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1		-	-	-	-	-
Chrysene	mg/kg	0.1		-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1		-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1		-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1		-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1		-	-	-	-	-
Dibenzo(a&h)anthracene	mg/kg	0.1		-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.1		-	-	-	-	-
Total PAH	mg/kg	0.8		-	-	-	-	-
Surrogates								
d5-nitrobenzene (Surrogate)	%	-		-	-	-	-	-
2-fluorobiphenyl (Surrogate)	%	-		-	-	-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-	-	-
OC Pesticides in Soil Method: AN400/AN420								
Hexachlorobenzene (HCB)	mg/kg	0.1		-	-	-	-	-
Alpha BHC	mg/kg	0.1		-	-	-	-	-
Lindane	mg/kg	0.1		-	-	-	-	-
Heptachlor	mg/kg	0.1		-	-	-	-	-
Aldrin	mg/kg	0.1		-	-	-	-	-
Beta BHC	mg/kg	0.1		-	-	-	-	-
Delta BHC	mg/kg	0.1		-	-	-	-	-
Heptachlor epoxide	mg/kg	0.1		-	-	-	-	-
o,p'-DDE	mg/kg	0.1		-	-	-	-	-
Alpha Endosulfan	mg/kg	0.2		-	-	-	-	-
Gamma Chlordane	mg/kg	0.1		-	-	-	-	-
Alpha Chlordane	mg/kg	0.1		-	-	-	-	-
trans-Nonachlor	mg/kg	0.1		-	-	-	-	-
p,p'-DDE	mg/kg	0.1		-	-	-	-	-
Dieldrin	mg/kg	0.2		-	-	-	-	-
Endrin	mg/kg	0.2		-	-	-	-	-
o,p'-DDD	mg/kg	0.1		-	-	-	-	-
o,p'-DDT	mg/kg	0.1		-	-	-	-	-
Beta Endosulfan	mg/kg	0.2		-	-	-	-	-
p,p'-DDD	mg/kg	0.1		-	-	-	-	-
p,p'-DDT	mg/kg	0.1		-	-	-	-	-
Endosulfan sulphate	mg/kg	0.1		-	-	-	-	-
Endrin Aldehyde	mg/kg	0.1		-	-	-	-	-
Methoxychlor	mg/kg	0.1		-	-	-	-	-
Endrin Ketone	mg/kg	0.1		-	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE103158.006 Soil 8/11/11 11:00 B1	SE103158.007 Water 8/11/11 11:00 R1	SE103158.008 Soil 8/11/11 11:00 BH1-1_ZLB	SE103158.009 Soil 8/11/11 11:00 BH2-1_ZLB	SE103158.010 Soil 8/11/11 11:00 BH3-1_ZLB
OC Pesticides in Soil Method: AN400/AN420 (continued)								
Surrogates								
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		-	-	-	-	-
OP Pesticides in Soil Method: AN400/AN420								
Dichlorvos	mg/kg	0.5		-	-	-	-	-
Dimethoate	mg/kg	0.5		-	-	-	-	-
Diazinon (Dimpylate)	mg/kg	0.5		-	-	-	-	-
Fenitrothion	mg/kg	0.2		-	-	-	-	-
Malathion	mg/kg	0.2		-	-	-	-	-
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2		-	-	-	-	-
Parathion-ethyl (Parathion)	mg/kg	0.2		-	-	-	-	-
Bromophos Ethyl	mg/kg	0.2		-	-	-	-	-
Methidathion	mg/kg	0.5		-	-	-	-	-
Ethion	mg/kg	0.2		-	-	-	-	-
Azinphos-methyl (Guthion)	mg/kg	0.2		-	-	-	-	-
Surrogates								
2-fluorobiphenyl (Surrogate)	%	-		-	-	-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-	-	-
PCBs in Soil Method: AN400/AN420								
Arochlor 1016	mg/kg	0.2		-	-	-	-	-
Arochlor 1221	mg/kg	0.2		-	-	-	-	-
Arochlor 1232	mg/kg	0.2		-	-	-	-	-
Arochlor 1242	mg/kg	0.2		-	-	-	-	-
Arochlor 1248	mg/kg	0.2		-	-	-	-	-
Arochlor 1254	mg/kg	0.2		-	-	-	-	-
Arochlor 1260	mg/kg	0.2		-	-	-	-	-
Arochlor 1262	mg/kg	0.2		-	-	-	-	-
Arochlor 1268	mg/kg	0.2		-	-	-	-	-
Total PCBs (Arochlors)	mg/kg	1		-	-	-	-	-
Surrogates								
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		-	-	-	-	-
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320								
Arsenic, As	mg/kg	3		**4**	-	-	-	-
Cadmium, Cd	mg/kg	0.3		<0.3	-	-	-	-
Chromium, Cr	mg/kg	0.3		**8.9**	-	-	-	-
Copper, Cu	mg/kg	0.5		**21**	-	-	-	-
Lead, Pb	mg/kg	1		**6**	-	-	-	-
Nickel, Ni	mg/kg	0.5		**39**	-	-	-	-
Zinc, Zn	mg/kg	0.5		**28**	-	-	-	-
Mercury in Soil Method: AN312								
Mercury	mg/kg	0.05		<0.05	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE103158.006 Soil 8/11/11 11:00 B1	SE103158.007 Water 8/11/11 11:00 R1	SE103158.008 Soil 8/11/11 11:00 BH1-1_ZLB	SE103158.009 Soil 8/11/11 11:00 BH2-1_ZLB	SE103158.010 Soil 8/11/11 11:00 BH3-1_ZLB
Fibre Identification in soil Method: AN602								
FibreID								
Asbestos Detected	No unit	-		-	-	No	No	No
SemiQuant								
Estimated Fibres	%w/w	0.01		-	-	<0.01	<0.01	<0.01
VOCs in Water Method: AN433/AN434								
Monocyclic Aromatic Hydrocarbons								
Benzene	µg/L	0.5		-	<0.5	-	-	-
Toluene	µg/L	0.5		-	<0.5	-	-	-
Ethylbenzene	µg/L	0.5		-	<0.5	-	-	-
m/p-xylene	µg/L	1		-	<1	-	-	-
o-xylene	µg/L	0.5		-	<0.5	-	-	-
Oxygenated Compounds								
MtBE (Methyl-tert-butyl ether)	µg/L	0.5		-	<0.5	-	-	-
Surrogates								
Dibromofluoromethane (Surrogate)	%	-		-	**102**	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	**115**	-	-	-
d8-toluene (Surrogate)	%	-		-	**100**	-	-	-
Bromofluorobenzene (Surrogate)	%	-		-	**99**	-	-	-
Totals								
Total Xylenes	µg/L	1.5		-	<1.5	-	-	-
Total BTEX	µg/L	3		-	<3	-	-	-
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434								
TRH C6-C9	µg/L	40		-	<40	-	-	-
Surrogates								
Trifluorotoluene (Surrogate)	%	-		-	**100**	-	-	-
Dibromofluoromethane (Surrogate)	%	-		-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	-	-	-	-
d8-toluene (Surrogate)	%	-		-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-		-	-	-	-	-
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403								
TRH C10-C14	µg/L	100		-	<100	-	-	-
TRH C15-C28	µg/L	200		-	<200	-	-	-
TRH C29-C36	µg/L	200		-	<200	-	-	-
Surrogates								
TRH (Surrogate)	%	-		-	-	-	-	-
Trace Metals (Dissolved) in Water by ICPMS Method: AN318								
Arsenic, As	µg/L	1		-	<1	-	-	-
Cadmium, Cd	µg/L	0.1		-	<0.1	-	-	-
Chromium, Cr	µg/L	1		-	<1	-	-	-
Copper, Cu	µg/L	1		-	<1	-	-	-
Lead, Pb	µg/L	1		-	<1	-	-	-
Nickel, Ni	µg/L	1		-	<1	-	-	-
Zinc, Zn	µg/L	1		-	**23**	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE103158.006 Soil 8/11/11 11:00 B1	SE103158.007 Water 8/11/11 11:00 R1	SE103158.008 Soil 8/11/11 11:00 BH1-1_ZLB	SE103158.009 Soil 8/11/11 11:00 BH2-1_ZLB	SE103158.010 Soil 8/11/11 11:00 BH3-1_ZLB
Mercury (dissolved) in Water Method: AN311/AN312								
Mercury	mg/L	0.0001		-	<0.0001	-	-	-
Moisture Content Method: AN234								
% Moisture	%	0.5		**7.2**	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE103158.011 Soil 8/11/11 11:00 BH4-1_ZLB	SE103158.012 Soil 8/11/11 11:00 BH5-1_ZLB	SE103158.013 Soil 8/11/11 11:00 C1	SE103158.014 Soil 8/11/11 11:00 C2
VOC's in Soil Method: AN433/AN434							
Monocyclic Aromatic Hydrocarbons							
Benzene	mg/kg	0.1		-	-	-	-
Toluene	mg/kg	0.1		-	-	-	-
Ethylbenzene	mg/kg	0.1		-	-	-	-
m/p-xylene	mg/kg	0.2		-	-	-	-
o-xylene	mg/kg	0.1		-	-	-	-
Oxygenated Compounds							
MtBE (Methyl-tert-butyl ether)	mg/kg	0.1		-	-	-	-
Surrogates							
Dibromofluoromethane (Surrogate)	%	-		-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	-	-	-
d8-toluene (Surrogate)	%	-		-	-	-	-
Bromofluorobenzene (Surrogate)	%	-		-	-	-	-
Totals							
Total Xylenes*	mg/kg	0.3		-	-	-	-
Total BTEX*	mg/kg	-		-	-	-	-
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434							
TRH C6-C9	mg/kg	20		-	-	-	-
Surrogates							
Trifluorotoluene (Surrogate)	%	-		-	-	-	-
Dibromofluoromethane (Surrogate)	%	-		-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	-	-	-
d8-toluene (Surrogate)	%	-		-	-	-	-
Bromofluorobenzene (Surrogate)	%	-		-	-	-	-
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403							
TRH C10-C14	mg/kg	20		-	-	-	-
TRH C15-C28	mg/kg	50		-	-	-	-
TRH C29-C36	mg/kg	50		-	-	-	-
Surrogates							
TRH (Surrogate)	%	-		-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE103158.011 Soil 8/11/11 11:00 BH4-1_ZLB	SE103158.012 Soil 8/11/11 11:00 BH5-1_ZLB	SE103158.013 Soil 8/11/11 11:00 C1	SE103158.014 Soil 8/11/11 11:00 C2
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420							
Naphthalene	mg/kg	0.1		-	-	-	-
2-methylnaphthalene	mg/kg	0.1		-	-	-	-
1-methylnaphthalene	mg/kg	0.1		-	-	-	-
Acenaphthylene	mg/kg	0.1		-	-	-	-
Acenaphthene	mg/kg	0.1		-	-	-	-
Fluorene	mg/kg	0.1		-	-	-	-
Phenanthrene	mg/kg	0.1		-	-	-	-
Anthracene	mg/kg	0.1		-	-	-	-
Fluoranthene	mg/kg	0.1		-	-	-	-
Pyrene	mg/kg	0.1		-	-	-	-
Benzo(a)anthracene	mg/kg	0.1		-	-	-	-
Chrysene	mg/kg	0.1		-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1		-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1		-	-	-	-
Benzo(a)pyrene	mg/kg	0.1		-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1		-	-	-	-
Dibenzo(a&h)anthracene	mg/kg	0.1		-	-	-	-
Benzo(ghi)perylene	mg/kg	0.1		-	-	-	-
Total PAH	mg/kg	0.8		-	-	-	-
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		-	-	-	-
2-fluorobiphenyl (Surrogate)	%	-		-	-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-	-
OC Pesticides in Soil Method: AN400/AN420							
Hexachlorobenzene (HCB)	mg/kg	0.1		-	-	<0.1	<0.1
Alpha BHC	mg/kg	0.1		-	-	<0.1	<0.1
Lindane	mg/kg	0.1		-	-	<0.1	<0.1
Heptachlor	mg/kg	0.1		-	-	<0.1	<0.1
Aldrin	mg/kg	0.1		-	-	<0.1	<0.1
Beta BHC	mg/kg	0.1		-	-	<0.1	<0.1
Delta BHC	mg/kg	0.1		-	-	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1		-	-	<0.1	<0.1
o,p'-DDE	mg/kg	0.1		-	-	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2		-	-	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1		-	-	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1		-	-	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1		-	-	<0.1	<0.1
p,p'-DDE	mg/kg	0.1		-	-	<0.1	<0.1
Dieldrin	mg/kg	0.2		-	-	<0.2	<0.2
Endrin	mg/kg	0.2		-	-	<0.2	<0.2
o,p'-DDD	mg/kg	0.1		-	-	<0.1	<0.1
o,p'-DDT	mg/kg	0.1		-	-	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2		-	-	<0.2	<0.2
p,p'-DDD	mg/kg	0.1		-	-	<0.1	<0.1
p,p'-DDT	mg/kg	0.1		-	-	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1		-	-	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1		-	-	<0.1	<0.1
Methoxychlor	mg/kg	0.1		-	-	<0.1	<0.1
Endrin Ketone	mg/kg	0.1		-	-	<0.1	<0.1

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE103158.011 Soil 8/11/11 11:00 BH4-1_ZLB	SE103158.012 Soil 8/11/11 11:00 BH5-1_ZLB	SE103158.013 Soil 8/11/11 11:00 C1	SE103158.014 Soil 8/11/11 11:00 C2
OC Pesticides in Soil Method: AN400/AN420 (continued)							
Surrogates							
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		-	-	**101**	**97**
OP Pesticides in Soil Method: AN400/AN420							
Dichlorvos	mg/kg	0.5		-	-	<0.5	<0.5
Dimethoate	mg/kg	0.5		-	-	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5		-	-	<0.5	<0.5
Fenitrothion	mg/kg	0.2		-	-	<0.2	<0.2
Malathion	mg/kg	0.2		-	-	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2		-	-	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2		-	-	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2		-	-	<0.2	<0.2
Methidathion	mg/kg	0.5		-	-	<0.5	<0.5
Ethion	mg/kg	0.2		-	-	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2		-	-	<0.2	<0.2
Surrogates							
2-fluorobiphenyl (Surrogate)	%	-		-	-	**120**	**104**
d14-p-terphenyl (Surrogate)	%	-		-	-	**122**	**118**
PCBs in Soil Method: AN400/AN420							
Arochlor 1016	mg/kg	0.2		-	-	<0.2	<0.2
Arochlor 1221	mg/kg	0.2		-	-	<0.2	<0.2
Arochlor 1232	mg/kg	0.2		-	-	<0.2	<0.2
Arochlor 1242	mg/kg	0.2		-	-	<0.2	<0.2
Arochlor 1248	mg/kg	0.2		-	-	<0.2	<0.2
Arochlor 1254	mg/kg	0.2		-	-	<0.2	<0.2
Arochlor 1260	mg/kg	0.2		-	-	<0.2	<0.2
Arochlor 1262	mg/kg	0.2		-	-	<0.2	<0.2
Arochlor 1268	mg/kg	0.2		-	-	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1		-	-	<1	<1
Surrogates							
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		-	-	**101**	**97**
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320							
Arsenic, As	mg/kg	3		-	-	-	-
Cadmium, Cd	mg/kg	0.3		-	-	-	-
Chromium, Cr	mg/kg	0.3		-	-	-	-
Copper, Cu	mg/kg	0.5		-	-	-	-
Lead, Pb	mg/kg	1		-	-	-	-
Nickel, Ni	mg/kg	0.5		-	-	-	-
Zinc, Zn	mg/kg	0.5		-	-	-	-
Mercury in Soil Method: AN312							
Mercury	mg/kg	0.05		-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE103158.011 Soil 8/11/11 11:00 BH4-1_ZLB	SE103158.012 Soil 8/11/11 11:00 BH5-1_ZLB	SE103158.013 Soil 8/11/11 11:00 C1	SE103158.014 Soil 8/11/11 11:00 C2
Fibre Identification in soil Method: AN602							
FibreID							
Asbestos Detected	No unit	-		No	No	-	-
SemiQuant							
Estimated Fibres	%w/w	0.01		<0.01	<0.01	-	-
VOCs in Water Method: AN433/AN434							
Monocyclic Aromatic Hydrocarbons							
Benzene	µg/L	0.5		-	-	-	-
Toluene	µg/L	0.5		-	-	-	-
Ethylbenzene	µg/L	0.5		-	-	-	-
m/p-xylene	µg/L	1		-	-	-	-
o-xylene	µg/L	0.5		-	-	-	-
Oxygenated Compounds							
MtBE (Methyl-tert-butyl ether)	µg/L	0.5		-	-	-	-
Surrogates							
Dibromofluoromethane (Surrogate)	%	-		-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	-	-	-
d8-toluene (Surrogate)	%	-		-	-	-	-
Bromofluorobenzene (Surrogate)	%	-		-	-	-	-
Totals							
Total Xylenes	µg/L	1.5		-	-	-	-
Total BTEX	µg/L	3		-	-	-	-
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434							
TRH C6-C9	µg/L	40		-	-	-	-
Surrogates							
Trifluorotoluene (Surrogate)	%	-		-	-	-	-
Dibromofluoromethane (Surrogate)	%	-		-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	-	-	-
d8-toluene (Surrogate)	%	-		-	-	-	-
Bromofluorobenzene (Surrogate)	%	-		-	-	-	-
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403							
TRH C10-C14	µg/L	100		-	-	-	-
TRH C15-C28	µg/L	200		-	-	-	-
TRH C29-C36	µg/L	200		-	-	-	-
Surrogates							
TRH (Surrogate)	%	-		-	-	-	-
Trace Metals (Dissolved) in Water by ICPMS Method: AN318							
Arsenic, As	µg/L	1		-	-	-	-
Cadmium, Cd	µg/L	0.1		-	-	-	-
Chromium, Cr	µg/L	1		-	-	-	-
Copper, Cu	µg/L	1		-	-	-	-
Lead, Pb	µg/L	1		-	-	-	-
Nickel, Ni	µg/L	1		-	-	-	-
Zinc, Zn	µg/L	1		-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE103158.011 Soil 8/11/11 11:00 BH4-1_ZLB	SE103158.012 Soil 8/11/11 11:00 BH5-1_ZLB	SE103158.013 Soil 8/11/11 11:00 C1	SE103158.014 Soil 8/11/11 11:00 C2
Mercury (dissolved) in Water Method: AN311/AN312							
Mercury	mg/L	0.0001		-	-	-	-
Moisture Content Method: AN234							
% Moisture	%	0.5		-	-	**8.2**	**7.8**

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury (dissolved) in Water Method: ME-(AU)-[ENV]AN311/AN312

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Mercury	LB008531	mg/L	0.0001	<0.0001	3%	101%

Mercury in Soil Method: ME-(AU)-[ENV]AN312

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB008519	mg/kg	0.05	<0.05	0%	101%	104%

Moisture Content Method: ME-(AU)-[ENV]AN234

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB008581	%	0.5	1 - 4%

OC Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Hexachlorobenzene (HCB)	LB008598	mg/kg	0.1	<0.1	NA
Alpha BHC	LB008598	mg/kg	0.1	<0.1	NA
Lindane	LB008598	mg/kg	0.1	<0.1	NA
Heptachlor	LB008598	mg/kg	0.1	<0.1	117%
Aldrin	LB008598	mg/kg	0.1	<0.1	122%
Beta BHC	LB008598	mg/kg	0.1	<0.1	NA
Delta BHC	LB008598	mg/kg	0.1	<0.1	116%
Heptachlor epoxide	LB008598	mg/kg	0.1	<0.1	NA
o,p'-DDE	LB008598	mg/kg	0.1	<0.1	NA
Alpha Endosulfan	LB008598	mg/kg	0.2	<0.2	NA
Gamma Chlordane	LB008598	mg/kg	0.1	<0.1	NA
Alpha Chlordane	LB008598	mg/kg	0.1	<0.1	NA
trans-Nonachlor	LB008598	mg/kg	0.1	<0.1	NA
p,p'-DDE	LB008598	mg/kg	0.1	<0.1	NA
Dieldrin	LB008598	mg/kg	0.2	<0.2	114%
Endrin	LB008598	mg/kg	0.2	<0.2	119%
o,p'-DDD	LB008598	mg/kg	0.1	<0.1	NA
o,p'-DDT	LB008598	mg/kg	0.1	<0.1	NA
Beta Endosulfan	LB008598	mg/kg	0.2	<0.2	NA
p,p'-DDD	LB008598	mg/kg	0.1	<0.1	NA
p,p'-DDT	LB008598	mg/kg	0.1	<0.1	105%
Endosulfan sulphate	LB008598	mg/kg	0.1	<0.1	NA
Endrin Aldehyde	LB008598	mg/kg	0.1	<0.1	NA
Methoxychlor	LB008598	mg/kg	0.1	<0.1	NA
Endrin Ketone	LB008598	mg/kg	0.1	<0.1	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB008598	%	-	92%	96%

OP Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dichlorvos	LB008508	mg/kg	0.5	<0.5	78%
	LB008599	mg/kg	0.5	<0.5	78%
Dimethoate	LB008508	mg/kg	0.5	<0.5	NA
	LB008599	mg/kg	0.5	<0.5	NA
Diazinon (Dimpylate)	LB008508	mg/kg	0.5	<0.5	79%
	LB008599	mg/kg	0.5	<0.5	79%
Fenitrothion	LB008508	mg/kg	0.2	<0.2	NA

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

OP Pesticides in Soil **Method: ME-(AU)-[ENV]AN400/AN420 (continued)**

				MB	LCS %Recovery
Fenitrothion	LB008599	mg/kg	0.2	<0.2	NA
Malathion	LB008508	mg/kg	0.2	<0.2	NA
	LB008599	mg/kg	0.2	<0.2	NA
Chlorpyrifos (Chlorpyrifos Ethyl)	LB008508	mg/kg	0.2	<0.2	100%
	LB008599	mg/kg	0.2	<0.2	100%
Parathion-ethyl (Parathion)	LB008508	mg/kg	0.2	<0.2	NA
	LB008599	mg/kg	0.2	<0.2	NA
Bromophos Ethyl	LB008508	mg/kg	0.2	<0.2	NA
	LB008599	mg/kg	0.2	<0.2	NA
Methidathion	LB008508	mg/kg	0.5	<0.5	NA
	LB008599	mg/kg	0.5	<0.5	NA
Ethion	LB008508	mg/kg	0.2	<0.2	84%
	LB008599	mg/kg	0.2	<0.2	84%
Azinphos-methyl (Guthion)	LB008508	mg/kg	0.2	<0.2	NA
	LB008599	mg/kg	0.2	<0.2	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
2-fluorobiphenyl (Surrogate)	LB008508	%	-	96%	94%
	LB008599	%	-	96%	94%
d14-p-terphenyl (Surrogate)	LB008508	%	-	116%	110%
	LB008599	%	-	116%	110%

PAH (Polynuclear Aromatic Hydrocarbons) in Soil **Method: ME-(AU)-[ENV]AN420**

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery	MS %Recovery
Naphthalene	LB008599	mg/kg	0.1	<0.1	90%	107%
2-methylnaphthalene	LB008599	mg/kg	0.1	<0.1	NA	NA
1-methylnaphthalene	LB008599	mg/kg	0.1	<0.1	NA	NA
Acenaphthylene	LB008599	mg/kg	0.1	<0.1	90%	106%
Acenaphthene	LB008599	mg/kg	0.1	<0.1	106%	115%
Fluorene	LB008599	mg/kg	0.1	<0.1	NA	NA
Phenanthrene	LB008599	mg/kg	0.1	<0.1	97%	104%
Anthracene	LB008599	mg/kg	0.1	<0.1	96%	111%
Fluoranthene	LB008599	mg/kg	0.1	<0.1	96%	111%
Pyrene	LB008599	mg/kg	0.1	<0.1	101%	116%
Benzo(a)anthracene	LB008599	mg/kg	0.1	<0.1	NA	NA
Chrysene	LB008599	mg/kg	0.1	<0.1	NA	NA
Benzo(b)fluoranthene	LB008599	mg/kg	0.1	<0.1	NA	NA
Benzo(k)fluoranthene	LB008599	mg/kg	0.1	<0.1	NA	NA
Benzo(a)pyrene	LB008599	mg/kg	0.1	<0.1	94%	101%
Indeno(1,2,3-cd)pyrene	LB008599	mg/kg	0.1	<0.1	NA	NA
Dibenzo(a&h)anthracene	LB008599	mg/kg	0.1	<0.1	NA	NA
Benzo(ghi)perylene	LB008599	mg/kg	0.1	<0.1	NA	NA
Total PAH	LB008599	mg/kg	0.8	<0.8	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery	MS %Recovery
d5-nitrobenzene (Surrogate)	LB008508	%	-	%		
	LB008599	%	-	94%	82%	103%
2-fluorobiphenyl (Surrogate)	LB008508	%	-	%		
	LB008599	%	-	74%	74%	101%
d14-p-terphenyl (Surrogate)	LB008508	%	-	%		
	LB008599	%	-	95%	92%	114%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

PCBs in Soil Method: ME-(AU)-[ENV]AN400/AN420

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Arochlor 1016	LB008598	mg/kg	0.2	<0.2	NA
Arochlor 1221	LB008598	mg/kg	0.2	<0.2	NA
Arochlor 1232	LB008598	mg/kg	0.2	<0.2	NA
Arochlor 1242	LB008598	mg/kg	0.2	<0.2	NA
Arochlor 1248	LB008598	mg/kg	0.2	<0.2	NA
Arochlor 1254	LB008598	mg/kg	0.2	<0.2	NA
Arochlor 1260	LB008598	mg/kg	0.2	<0.2	118%
Arochlor 1262	LB008598	mg/kg	0.2	<0.2	NA
Arochlor 1268	LB008598	mg/kg	0.2	<0.2	NA
Total PCBs (Arochlors)	LB008598	mg/kg	1	<1	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB008598	%	-	92%	99%

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: ME-(AU)-[ENV]AN040/AN320

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Arsenic, As	LB008525	mg/kg	3	<3	48%	101%	92%
Cadmium, Cd	LB008525	mg/kg	0.3	<0.3	0%	103%	89%
Chromium, Cr	LB008525	mg/kg	0.3	<0.3	8%	103%	92%
Copper, Cu	LB008525	mg/kg	0.5	<0.5	5%	105%	90%
Lead, Pb	LB008525	mg/kg	1	<1	1%	104%	85%
Nickel, Ni	LB008525	mg/kg	0.5	<0.5	4%	103%	76%
Zinc, Zn	LB008525	mg/kg	0.5	<0.5	5%	103%	88%

Trace Metals (Dissolved) in Water by ICPMS Method: ME-(AU)-[ENV]AN318

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Arsenic, As	LB008584	µg/L	1	<1	0%	97%
Cadmium, Cd	LB008584	µg/L	0.1	<0.1	0%	98%
Chromium, Cr	LB008584	µg/L	1	<1	0%	100%
Copper, Cu	LB008584	µg/L	1	<1	0%	101%
Lead, Pb	LB008584	µg/L	1	<1	0%	100%
Nickel, Ni	LB008584	µg/L	1	<1	0%	104%
Zinc, Zn	LB008584	µg/L	1	<1	6%	101%

TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH C10-C14	LB008503	mg/kg	20	<20	118%
TRH C15-C28	LB008503	mg/kg	50	<50	125%
TRH C29-C36	LB008503	mg/kg	50	<50	98%

TRH (Total Recoverable Hydrocarbons) in Water Method: ME-(AU)-[ENV]AN403

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH C10-C14	LB008493	µg/L	100	<100	102%
TRH C15-C28	LB008493	µg/L	200	<200	116%
TRH C29-C36	LB008493	µg/L	200	<200	109%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Benzene	LB008664	mg/kg	0.1	<0.1	0%	127%
Toluene	LB008664	mg/kg	0.1	<0.1	0%	133%
Ethylbenzene	LB008664	mg/kg	0.1	<0.1	0%	137%
m/p-xylene	LB008664	mg/kg	0.2	<0.2	0%	135%
o-xylene	LB008664	mg/kg	0.1	<0.1	0%	133%

Oxygenated Compounds

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
MtBE (Methyl-tert-butyl ether)	LB008664	mg/kg	0.1	<0.1	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB008664	%	-	97%	4%	104%
d4-1,2-dichloroethane (Surrogate)	LB008664	%	-	101%	2%	106%
d8-toluene (Surrogate)	LB008664	%	-	93%	5%	100%
Bromofluorobenzene (Surrogate)	LB008664	%	-	104%	2%	97%

Totals

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Xylenes*	LB008664	mg/kg	0.3	<0.3	0%	NA
Total BTEX*	LB008664	mg/kg	-	0	NA	NA

VOCs in Water Method: ME-(AU)-[ENV]AN433/AN434

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene	LB008492	µg/L	0.5	<0.5	0%	124%	112%
Toluene	LB008492	µg/L	0.5	<0.5	0%	119%	112%
Ethylbenzene	LB008492	µg/L	0.5	<0.5	1%	128%	110%
m/p-xylene	LB008492	µg/L	1	<1	0%	121%	112%
o-xylene	LB008492	µg/L	0.5	<0.5	0%	120%	111%

Oxygenated Compounds

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
MtBE (Methyl-tert-butyl ether)	LB008492	µg/L	0.5	<0.5	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dibromofluoromethane (Surrogate)	LB008492	%	-	108%	3 - 4%	92%	98%
d4-1,2-dichloroethane (Surrogate)	LB008492	%	-	106%	0 - 5%	99%	109%
d8-toluene (Surrogate)	LB008492	%	-	101%	0 - 1%	101%	100%
Bromofluorobenzene (Surrogate)	LB008492	%	-	106%	0 - 2%	95%	99%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Volatile Petroleum Hydrocarbons in Soil **Method: ME-(AU)-[ENV]AN433/AN434**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
TRH C6-C9	LB008664	mg/kg	20	<20	0%	130%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Trifluorotoluene (Surrogate)	LB008664	%	-	101%	0%	82%

Volatile Petroleum Hydrocarbons in Water **Method: ME-(AU)-[ENV]AN433/AN434**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C6-C9	LB008492	µg/L	40	<40	131%	116%	97%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Trifluorotoluene (Surrogate)	LB008492	%	-	101%	0 - 1%	90%	100%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analsysis by ASS or ICP as per USEPA Method 200.8.
AN083	Separatory funnels are used for aqueous samples and extracted by transferring an appropriate volume (mass) of liquid into a separatory funnel and adding 3 serial aliquots of dichloromethane. Samples receive a single extraction at pH 7 to recover base / neutral analytes and two extractions at pH < 2 to recover acidic analytes. QC samples are prepared by spiking organic free water with target analytes and extracting as per samples.
AN088	Orbital rolling for Organic pollutants are extracted from soil/sediment by transferring an appropriate mass of sample to a clear soil jar and extracting with 1:1 Dichloromethane/Acetone. Orbital Rolling method is intended for the extraction of semi-volatile organic compounds from soil/sediment samples, and is based somewhat on USEPA method 3570 (Micro Organic extraction and sample preparation). Method 3700.
AN234	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN311/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN400	OC and OP Pesticides by GC-ECD: The determination of organochlorine (OC) and organophosphorus (OP) pesticides and polychlorinated biphenyls (PCBs) in soils, sludges and groundwater. (Based on USEPA methods 3510, 3550, 8140 and 8080.)
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with diffential polarity of the elluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependant on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN433/AN434	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible.

FOOTNOTES

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
*	This analysis is not covered by the scope of accreditation.
^	Performed by outside laboratory.
LOR	Limit of Reporting
↑↓	Raised or Lowered Limit of Reporting
QFH	QC result is above the upper tolerance
QFL	QC result is below the lower tolerance
-	The sample was not analysed for this analyte
NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf

STATEMENT OF QA/QC PERFORMANCE AGAINST DATA QUALITY OBJECTIVES

SE103158 R0

CLIENT DETAILS

Contact	Anthony Barkway
Client	Environmental Investigations
Address	17 / 1A Coulson Street Erskineville NSW 2043
Telephone	02 9516 0722
Facsimile	02 9516 0741
Email	anthony.barkway@eiaustralia.com.au
Project	**E1481.1 - Miranda NSW**
Order Number	(Not specified)
Samples	14

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	SE103158 R0
Report Number	0000011655
Date Reported	14 Nov 2011

COMMENTS

All the laboratory data for each environmental matrix was compared to the SGS Environmental Services' stated data quality objectives (DQO).
Comments arising from the comparison were made and are reported below.
The data relating to sampling was taken from the chain of custody document and was supplied by the client.
This QA/QC statement must be read in conjunction with the referenced analytical report.
The statement and the analytical report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Duplicate	Volatile Petroleum Hydrocarbons in Water	1 Item

SAMPLE SUMMARY

Sample counts by matrix	11 Soils, 1 Water	Type of documentation received	COC
Date documentation received	9/11/2011	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	2.7°C
Sample container provider	SGS	Turnaround time requested	Three Days
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

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HOLDING TIMES

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The extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and Analysis dates are shown in **Green** when within suggested criteria and in **Bold** with an appended dagger symbol and Red† when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Sample Name	Sample Number	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Fibre Identification in soil Method: ME-(AU)-[ENV]AN602								
BH1-1_ZLB	SE103158.008	LB008574	08 Nov 2011	09 Nov 2011	07 Nov 2012	10 Nov 2011	07 Nov 2012	11 Nov 2011
BH2-1_ZLB	SE103158.009	LB008574	08 Nov 2011	09 Nov 2011	07 Nov 2012	10 Nov 2011	07 Nov 2012	11 Nov 2011
BH3-1_ZLB	SE103158.010	LB008574	08 Nov 2011	09 Nov 2011	07 Nov 2012	10 Nov 2011	07 Nov 2012	11 Nov 2011
BH4-1_ZLB	SE103158.011	LB008574	08 Nov 2011	09 Nov 2011	07 Nov 2012	10 Nov 2011	07 Nov 2012	11 Nov 2011
BH5-1_ZLB	SE103158.012	LB008574	08 Nov 2011	09 Nov 2011	07 Nov 2012	10 Nov 2011	07 Nov 2012	11 Nov 2011
Mercury (dissolved) in Water Method: ME-(AU)-[ENV]AN311/AN312								
R1	SE103158.007	LB008531	08 Nov 2011	09 Nov 2011	06 Dec 2011	10 Nov 2011	06 Dec 2011	10 Nov 2011
Mercury in Soil Method: ME-(AU)-[ENV]AN312								
BH1-1	SE103158.001	LB008519	08 Nov 2011	09 Nov 2011	06 Dec 2011	10 Nov 2011	06 Dec 2011	10 Nov 2011
BH2-1	SE103158.002	LB008519	08 Nov 2011	09 Nov 2011	06 Dec 2011	10 Nov 2011	06 Dec 2011	10 Nov 2011
BH3-1	SE103158.003	LB008519	08 Nov 2011	09 Nov 2011	06 Dec 2011	10 Nov 2011	06 Dec 2011	10 Nov 2011
BH4-1	SE103158.004	LB008519	08 Nov 2011	09 Nov 2011	06 Dec 2011	10 Nov 2011	06 Dec 2011	10 Nov 2011
BH5-1	SE103158.005	LB008519	08 Nov 2011	09 Nov 2011	06 Dec 2011	10 Nov 2011	06 Dec 2011	10 Nov 2011
B1	SE103158.006	LB008519	08 Nov 2011	09 Nov 2011	06 Dec 2011	10 Nov 2011	06 Dec 2011	10 Nov 2011
Moisture Content Method: ME-(AU)-[ENV]AN234								
BH1-1	SE103158.001	LB008581	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	15 Nov 2011	11 Nov 2011
BH2-1	SE103158.002	LB008581	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	15 Nov 2011	11 Nov 2011
BH3-1	SE103158.003	LB008581	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	15 Nov 2011	11 Nov 2011
BH4-1	SE103158.004	LB008581	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	15 Nov 2011	11 Nov 2011
BH5-1	SE103158.005	LB008581	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	15 Nov 2011	11 Nov 2011
B1	SE103158.006	LB008581	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	15 Nov 2011	11 Nov 2011
C1	SE103158.013	LB008581	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	15 Nov 2011	11 Nov 2011
C2	SE103158.014	LB008581	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	15 Nov 2011	11 Nov 2011
OC Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420								
C1	SE103158.013	LB008598	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	20 Dec 2011	14 Nov 2011
C2	SE103158.014	LB008598	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	20 Dec 2011	14 Nov 2011
OP Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420								
BH1-1	SE103158.001	LB008599	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	20 Dec 2011	14 Nov 2011
BH2-1	SE103158.002	LB008599	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	20 Dec 2011	14 Nov 2011
BH3-1	SE103158.003	LB008599	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	20 Dec 2011	14 Nov 2011
BH4-1	SE103158.004	LB008599	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	20 Dec 2011	14 Nov 2011
BH5-1	SE103158.005	LB008599	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	20 Dec 2011	14 Nov 2011
C1	SE103158.013	LB008508	08 Nov 2011	09 Nov 2011	22 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011
C2	SE103158.014	LB008508	08 Nov 2011	09 Nov 2011	22 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420								
BH1-1	SE103158.001	LB008599	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	20 Dec 2011	11 Nov 2011
BH2-1	SE103158.002	LB008599	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	20 Dec 2011	11 Nov 2011
BH3-1	SE103158.003	LB008599	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	20 Dec 2011	11 Nov 2011
BH4-1	SE103158.004	LB008599	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	20 Dec 2011	11 Nov 2011
BH5-1	SE103158.005	LB008599	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	20 Dec 2011	11 Nov 2011
C1	SE103158.013	LB008508	08 Nov 2011	09 Nov 2011	22 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011
C2	SE103158.014	LB008508	08 Nov 2011	09 Nov 2011	22 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011

HOLDING TIME SUMMARY

SE103158 R0

HOLDING TIMES

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Sample Name	Sample Number	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
PCBs in Soil Method: ME-(AU)-[ENV]AN400/AN420								
C1	SE103158.013	LB008598	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	20 Dec 2011	14 Nov 2011
C2	SE103158.014	LB008598	08 Nov 2011	09 Nov 2011	22 Nov 2011	10 Nov 2011	20 Dec 2011	14 Nov 2011
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: ME-(AU)-[ENV]AN040/AN320								
BH1-1	SE103158.001	LB008525	08 Nov 2011	09 Nov 2011	06 May 2012	10 Nov 2011	06 May 2012	11 Nov 2011
BH2-1	SE103158.002	LB008525	08 Nov 2011	09 Nov 2011	06 May 2012	10 Nov 2011	06 May 2012	11 Nov 2011
BH3-1	SE103158.003	LB008525	08 Nov 2011	09 Nov 2011	06 May 2012	10 Nov 2011	06 May 2012	11 Nov 2011
BH4-1	SE103158.004	LB008525	08 Nov 2011	09 Nov 2011	06 May 2012	10 Nov 2011	06 May 2012	11 Nov 2011
BH5-1	SE103158.005	LB008525	08 Nov 2011	09 Nov 2011	06 May 2012	10 Nov 2011	06 May 2012	11 Nov 2011
B1	SE103158.006	LB008525	08 Nov 2011	09 Nov 2011	06 May 2012	10 Nov 2011	06 May 2012	11 Nov 2011
Trace Metals (Dissolved) in Water by ICPMS Method: ME-(AU)-[ENV]AN318								
R1	SE103158.007	LB008584	08 Nov 2011	09 Nov 2011	06 May 2012	10 Nov 2011	06 May 2012	14 Nov 2011
TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403								
BH1-1	SE103158.001	LB008503	08 Nov 2011	09 Nov 2011	22 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011
BH2-1	SE103158.002	LB008503	08 Nov 2011	09 Nov 2011	22 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011
BH3-1	SE103158.003	LB008503	08 Nov 2011	09 Nov 2011	22 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011
BH4-1	SE103158.004	LB008503	08 Nov 2011	09 Nov 2011	22 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011
BH5-1	SE103158.005	LB008503	08 Nov 2011	09 Nov 2011	22 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011
B1	SE103158.006	LB008503	08 Nov 2011	09 Nov 2011	22 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011
C1	SE103158.013	LB008503	08 Nov 2011	09 Nov 2011	22 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011
C2	SE103158.014	LB008503	08 Nov 2011	09 Nov 2011	22 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011
TRH (Total Recoverable Hydrocarbons) in Water Method: ME-(AU)-[ENV]AN403								
R1	SE103158.007	LB008493	08 Nov 2011	09 Nov 2011	15 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011
VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434								
BH1-1	SE103158.001	LB008664	08 Nov 2011	09 Nov 2011	22 Nov 2011	11 Nov 2011	21 Dec 2011	11 Nov 2011
BH2-1	SE103158.002	LB008664	08 Nov 2011	09 Nov 2011	22 Nov 2011	11 Nov 2011	21 Dec 2011	11 Nov 2011
BH3-1	SE103158.003	LB008664	08 Nov 2011	09 Nov 2011	22 Nov 2011	11 Nov 2011	21 Dec 2011	11 Nov 2011
BH4-1	SE103158.004	LB008664	08 Nov 2011	09 Nov 2011	22 Nov 2011	11 Nov 2011	21 Dec 2011	11 Nov 2011
BH5-1	SE103158.005	LB008664	08 Nov 2011	09 Nov 2011	22 Nov 2011	11 Nov 2011	21 Dec 2011	11 Nov 2011
VOCs in Water Method: ME-(AU)-[ENV]AN433/AN434								
R1	SE103158.007	LB008492	08 Nov 2011	09 Nov 2011	15 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011
Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433/AN434								
BH1-1	SE103158.001	LB008664	08 Nov 2011	09 Nov 2011	22 Nov 2011	11 Nov 2011	21 Dec 2011	11 Nov 2011
BH2-1	SE103158.002	LB008664	08 Nov 2011	09 Nov 2011	22 Nov 2011	11 Nov 2011	21 Dec 2011	11 Nov 2011
BH3-1	SE103158.003	LB008664	08 Nov 2011	09 Nov 2011	22 Nov 2011	11 Nov 2011	21 Dec 2011	11 Nov 2011
BH4-1	SE103158.004	LB008664	08 Nov 2011	09 Nov 2011	22 Nov 2011	11 Nov 2011	21 Dec 2011	11 Nov 2011
BH5-1	SE103158.005	LB008664	08 Nov 2011	09 Nov 2011	22 Nov 2011	11 Nov 2011	21 Dec 2011	11 Nov 2011

HOLDING TIME SUMMARY

SE103158 R0

HOLDING TIMES

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Sample Name	Sample Number	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Volatile Petroleum Hydrocarbons in Water Method: ME-(AU)-[ENV]AN433/AN434								
R1	SE103158.007	LB008492	08 Nov 2011	09 Nov 2011	15 Nov 2011	09 Nov 2011	19 Dec 2011	14 Nov 2011

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.
Result is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
OC Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420					
Tetrachloro-m-xylene (TCMX) (Surrogate)	C1	SE103158.013	%	60 - 130%	101
	C2	SE103158.014	%	60 - 130%	97
OP Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420					
2-fluorobiphenyl (Surrogate)	C1	SE103158.013	%	60 - 130%	120
	C2	SE103158.014	%	60 - 130%	104
d14-p-terphenyl (Surrogate)	C1	SE103158.013	%	60 - 130%	122
	C2	SE103158.014	%	60 - 130%	118
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420					
2-fluorobiphenyl (Surrogate)	BH1-1	SE103158.001	%	60 - 130%	92
	BH2-1	SE103158.002	%	60 - 130%	88
	BH3-1	SE103158.003	%	60 - 130%	94
	BH4-1	SE103158.004	%	60 - 130%	97
	BH5-1	SE103158.005	%	60 - 130%	94
d14-p-terphenyl (Surrogate)	BH1-1	SE103158.001	%	60 - 130%	110
	BH2-1	SE103158.002	%	60 - 130%	113
	BH3-1	SE103158.003	%	60 - 130%	116
	BH4-1	SE103158.004	%	60 - 130%	120
	BH5-1	SE103158.005	%	60 - 130%	123
d5-nitrobenzene (Surrogate)	BH1-1	SE103158.001	%	60 - 130%	109
	BH2-1	SE103158.002	%	60 - 130%	101
	BH3-1	SE103158.003	%	60 - 130%	112
	BH4-1	SE103158.004	%	60 - 130%	114
	BH5-1	SE103158.005	%	60 - 130%	111
PCBs in Soil Method: ME-(AU)-[ENV]AN400/AN420					
Tetrachloro-m-xylene (TCMX) (Surrogate)	C1	SE103158.013	%	60 - 130%	101
	C2	SE103158.014	%	60 - 130%	97
VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434					
Bromofluorobenzene (Surrogate)	BH1-1	SE103158.001	%	60 - 130%	99
	BH2-1	SE103158.002	%	60 - 130%	100
	BH3-1	SE103158.003	%	60 - 130%	99
	BH4-1	SE103158.004	%	60 - 130%	99
	BH5-1	SE103158.005	%	60 - 130%	98
d4-1,2-dichloroethane (Surrogate)	BH1-1	SE103158.001	%	60 - 130%	102
	BH2-1	SE103158.002	%	60 - 130%	105
	BH3-1	SE103158.003	%	60 - 130%	99
	BH4-1	SE103158.004	%	60 - 130%	99
	BH5-1	SE103158.005	%	60 - 130%	99
d8-toluene (Surrogate)	BH1-1	SE103158.001	%	60 - 130%	99
	BH2-1	SE103158.002	%	60 - 130%	101
	BH3-1	SE103158.003	%	60 - 130%	97
	BH4-1	SE103158.004	%	60 - 130%	95
	BH5-1	SE103158.005	%	60 - 130%	95
Dibromofluoromethane (Surrogate)	BH1-1	SE103158.001	%	60 - 130%	101
	BH2-1	SE103158.002	%	60 - 130%	104
	BH3-1	SE103158.003	%	60 - 130%	97
	BH4-1	SE103158.004	%	60 - 130%	97
	BH5-1	SE103158.005	%	60 - 130%	95

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.
Result is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
VOCs in Water Method: ME-(AU)-[ENV]AN433/AN434					
Bromofluorobenzene (Surrogate)	R1	SE103158.007	%	60 - 130%	99
d4-1,2-dichloroethane (Surrogate)	R1	SE103158.007	%	40 - 130%	115
d8-toluene (Surrogate)	R1	SE103158.007	%	60 - 130%	100
Dibromofluoromethane (Surrogate)	R1	SE103158.007	%	60 - 130%	102
Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433/AN434					
Trifluorotoluene (Surrogate)	BH1-1	SE103158.001	%	60 - 130%	112
	BH2-1	SE103158.002	%	60 - 130%	101
	BH3-1	SE103158.003	%	60 - 130%	129
	BH4-1	SE103158.004	%	60 - 130%	118
	BH5-1	SE103158.005	%	60 - 130%	110
Volatile Petroleum Hydrocarbons in Water Method: ME-(AU)-[ENV]AN433/AN434					
Trifluorotoluene (Surrogate)	R1	SE103158.007	%	40 - 130%	100

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, which is typically 2.5 times the statistically determined method detection limit (MDL).
Result is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

Parameter	Units	Control LOR	BLK MB
Mercury (dissolved) in Water Method: ME-(AU)-[ENV]AN311/AN312			
LB008531.001			
Mercury	mg/L	0.0001	<0.0001
Mercury in Soil Method: ME-(AU)-[ENV]AN312			
LB008519.001			
Mercury	mg/kg	0.05	<0.05
OC Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420			
LB008598.001			
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1
Lindane	mg/kg	0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1
Aldrin	mg/kg	0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2
Endrin	mg/kg	0.2	<0.2
Beta Endosulfan	mg/kg	0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1
Surrogates			
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	92
OP Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420			
LB008508.001			
Dichlorvos	mg/kg	0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2
Malathion	mg/kg	0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2
Methidathion	mg/kg	0.5	<0.5
Ethion	mg/kg	0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
Surrogates			
2-fluorobiphenyl (Surrogate)	%	-	96
d14-p-terphenyl (Surrogate)	%	-	116
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420			
LB008599.001			
Naphthalene	mg/kg	0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1

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Parameter	Units	Control LOR	BLK MB
Continued... PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420			
LB008599.001			
Acenaphthylene	mg/kg	0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1
Fluorene	mg/kg	0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1
Pyrene	mg/kg	0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1
Chrysene	mg/kg	0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1
Total PAH	mg/kg	0.8	<0.8
Surrogates			
d5-nitrobenzene (Surrogate)	%	-	94
2-fluorobiphenyl (Surrogate)	%	-	74
d14-p-terphenyl (Surrogate)	%	-	95
PCBs in Soil Method: ME-(AU)-[ENV]AN400/AN420			
LB008598.001			
Arochlor 1016	mg/kg	0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1
Surrogates			
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	92
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: ME-(AU)-[ENV]AN040/AN320			
LB008525.001			
Arsenic, As	mg/kg	3	<3
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.3	<0.3
Copper, Cu	mg/kg	0.5	<0.5
Lead, Pb	mg/kg	1	<1
Nickel, Ni	mg/kg	0.5	<0.5
Zinc, Zn	mg/kg	0.5	<0.5
Trace Metals (Dissolved) in Water by ICPMS Method: ME-(AU)-[ENV]AN318			
LB008584.001			
Arsenic, As	µg/L	1	<1
Cadmium, Cd	µg/L	0.1	<0.1
Chromium, Cr	µg/L	1	<1
Copper, Cu	µg/L	1	<1
Lead, Pb	µg/L	1	<1
Nickel, Ni	µg/L	1	<1
Zinc, Zn	µg/L	1	<1
TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403			
LB008503.001			

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, which is typically 2.5 times the statistically determined method detection limit (MDL).
Result is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

Parameter	Units	Control LOR	BLK MB
Continued... TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403			
LB008503.001			
TRH C10-C14	mg/kg	20	<20
TRH C15-C28	mg/kg	50	<50
TRH C29-C36	mg/kg	50	<50
TRH (Total Recoverable Hydrocarbons) in Water Method: ME-(AU)-[ENV]AN403			
LB008493.001			
TRH C10-C14	µg/L	100	<100
TRH C15-C28	µg/L	200	<200
TRH C29-C36	µg/L	200	<200
VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434			
LB008664.001			
Monocyclic Aromatic Hydrocarbons			
Benzene	mg/kg	0.1	<0.1
Toluene	mg/kg	0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2
o-xylene	mg/kg	0.1	<0.1
Oxygenated Compounds			
MtBE (Methyl-tert-butyl ether)	mg/kg	0.1	<0.1
Surrogates			
Dibromofluoromethane (Surrogate)	%	-	97
d4-1,2-dichloroethane (Surrogate)	%	-	101
d8-toluene (Surrogate)	%	-	93
Bromofluorobenzene (Surrogate)	%	-	104
Totals			
Total BTEX*	mg/kg	-	0
Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433/AN434			
LB008664.001			
TRH C6-C9	mg/kg	20	<20
Surrogates			
Trifluorotoluene (Surrogate)	%	-	101
Volatile Petroleum Hydrocarbons in Water Method: ME-(AU)-[ENV]AN433/AN434			
LB008492.001			
TRH C6-C9	µg/L	40	<40
Surrogates			
Trifluorotoluene (Surrogate)	%	-	101

Duplicates are calculated as relative percent difference (RPD) using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
Where the MaxAllowableDifference evaluates to a number larger than 200 it is displayed as 200.
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Sample Name	SE103131.006-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
VOCs in Water Method: ME-(AU)-[ENV]AN433/AN434						
LB008492.004						
Monocyclic Aromatic Hydrocarbons						
Benzene	µg/L	0.5	0	<0.5	200	0
Toluene	µg/L	0.5	0	<0.5	200	0
Ethylbenzene	µg/L	0.5	0	<0.5	200	0
m/p-xylene	µg/L	1	0	<1	200	0
o-xylene	µg/L	0.5	0	<0.5	200	0
Surrogates						
Dibromofluoromethane (Surrogate)	µg/L	-	91	95.0	30	4
d4-1,2-dichloroethane (Surrogate)	µg/L	-	85	85.0	30	0
d8-toluene (Surrogate)	µg/L	-	99	99.0	30	0
Bromofluorobenzene (Surrogate)	µg/L	-	103	101.0	30	2
Volatile Petroleum Hydrocarbons in Water Method: ME-(AU)-[ENV]AN433/AN434						
LB008492.004						
TRH C6-C9	µg/L	40	0	<40	200	0
Surrogates						
Trifluorotoluene (Surrogate)	%	-	99	99.0	30	0

		Sample Name	SE103131.034-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Trace Metals (Dissolved) in Water by ICPMS Method: ME-(AU)-[ENV]AN318						
LB008584.014						
Arsenic, As	µg/L	1	0	<1	200	0
Cadmium, Cd	µg/L	0.1	0	<0.1	200	0
Chromium, Cr	µg/L	1	0	<1	200	0
Copper, Cu	µg/L	1	0	<1	200	0
Lead, Pb	µg/L	1	0	<1	200	0
Nickel, Ni	µg/L	1	0	<1	200	0
Zinc, Zn	µg/L	1	106	100	16	6

		Sample Name	SE103144.016-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
VOCs in Water Method: ME-(AU)-[ENV]AN433/AN434						
LB008492.013						
Monocyclic Aromatic Hydrocarbons						
Benzene	µg/L	0.5	0	<0.5	200	0
Toluene	µg/L	0.5	0	<0.5	200	0
Ethylbenzene	µg/L	0.5	2.48	2.5	50	1
m/p-xylene	µg/L	1	0	<1	200	0
o-xylene	µg/L	0.5	0	<0.5	200	0
Oxygenated Compounds						
MtBE (Methyl-tert-butyl ether)	µg/L	0.5	0	<0.5	200	0

Duplicates are calculated as relative percent difference (RPD) using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
Where the MaxAllowableDifference evaluates to a number larger than 200 it is displayed as 200.
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Sample Name	SE103144.016-DUP			
Parameter	**Units**	**LOR**	**Original Result**	**Duplicate Result**	**Criteria %**	**RPD %**
Continued... VOCs in Water Method: ME-(AU)-[ENV]AN433/AN434						
LB008492.013						
Surrogates						
Dibromofluoromethane (Surrogate)	µg/L	-	107	104.0	30	3
d4-1,2-dichloroethane (Surrogate)	µg/L	-	113	107.0	30	5
d8-toluene (Surrogate)	µg/L	-	102	101.0	30	1
Bromofluorobenzene (Surrogate)	µg/L	-	106	106.0	30	0
Volatile Petroleum Hydrocarbons in Water Method: ME-(AU)-[ENV]AN433/AN434						
LB008492.013						
TRH C6-C9	µg/L	40	409.09	86	46	**131†**
Surrogates						
Trifluorotoluene (Surrogate)	%	-	102	101.0	30	1

Duplicate failed acceptance criteria. Insufficient sample for re-testing.

		Sample Name	SE103158.001-DUP			
Parameter	**Units**	**LOR**	**Original Result**	**Duplicate Result**	**Criteria %**	**RPD %**
Mercury in Soil Method: ME-(AU)-[ENV]AN312						
LB008519.004						
Mercury	mg/kg	0.05	<0.05	<0.05	200	0

		Sample Name	SE103158.005-DUP			
Parameter	**Units**	**LOR**	**Original Result**	**Duplicate Result**	**Criteria %**	**RPD %**
VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434						
LB008664.010						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	<0.1	<0.1	200	0
Toluene	mg/kg	0.1	<0.1	<0.1	200	0
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
Oxygenated Compounds						
MtBE (Methyl-tert-butyl ether)	mg/kg	0.1	<0.1	<0.1	200	0
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	95.0	99.0	50	4
d4-1,2-dichloroethane (Surrogate)	%	-	99.0	101.0	50	2
d8-toluene (Surrogate)	%	-	95.0	100.0	50	5
Bromofluorobenzene (Surrogate)	%	-	98.0	100.0	50	2
Totals						
Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0
Total BTEX*	mg/kg	-	0	0	200	NA

Duplicates are calculated as relative percent difference (RPD) using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
Where the MaxAllowableDifference evaluates to a number larger than 200 it is displayed as 200.
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

	Sample Name		SE103158.005-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Volatile Petroleum Hydrocarbons in Soil **Method: ME-(AU)-[ENV]AN433/AN434**						
LB008664.010						
TRH C6-C9	mg/kg	20	<20	<20	200	0
Surrogates						
Trifluorotoluene (Surrogate)	%	-	110	110	30	0

	Sample Name		SE103158.006-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Mercury in Soil **Method: ME-(AU)-[ENV]AN312**						
LB008519.011						
Mercury	mg/kg	0.05	<0.05	<0.05	200	0
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest **Method: ME-(AU)-[ENV]AN040/AN320**						
LB008525.010						
Arsenic, As	mg/kg	3	4	6	94	48
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	157	0
Chromium, Cr	mg/kg	0.3	8.9	8.2	34	8
Copper, Cu	mg/kg	0.5	21	23	32	5
Lead, Pb	mg/kg	1	6	6	48	1
Nickel, Ni	mg/kg	0.5	39	41	31	4
Zinc, Zn	mg/kg	0.5	28	29	32	5

	Sample Name		SE103158.007-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Mercury (dissolved) in Water **Method: ME-(AU)-[ENV]AN311/AN312**						
LB008531.009						
Mercury	µg/L	0.0001	<0.0001	<0.0001	97	3

	Sample Name		SE103161.002-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Moisture Content **Method: ME-(AU)-[ENV]AN234**						
LB008581.011						
% Moisture	%	0.5	9.80392156862745	9.9	35	1

	Sample Name		SE103161.011-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Trace Metals (Dissolved) in Water by ICPMS **Method: ME-(AU)-[ENV]AN318**						
LB008584.023						
Lead, Pb	µg/L	1	0	<1	200	0

Duplicates are calculated as relative percent difference (RPD) using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
Where the MaxAllowableDifference evaluates to a number larger than 200 it is displayed as 200.
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Sample Name	SE103165.003-DUP			
Parameter	Units	LOR	Original Result	Duplicate Result	Criteria %	RPD %
Moisture Content Method: ME-(AU)-[ENV]AN234 LB008581.020						
% Moisture	%	0.5	15.8415841584158	15	33	4

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022).
For more information refer to the footnotes in the concluding page of the report.
Recovery is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Control	LCS STD			
Parameter	Units	LOR	Result	Expected Result	Criteria %	Recovery %
Mercury (dissolved) in Water Method: ME-(AU)-[ENV]AN311/AN312						
LB008531.002						
Mercury	mg/L	0.0001	0.0081	0.008	80 - 120	101
Mercury in Soil Method: ME-(AU)-[ENV]AN312						
LB008519.002						
Mercury	mg/kg	0.05	0.20	0.2	70 - 130	101
OC Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420						
LB008598.002						
Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	117
Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	122
Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	116
Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	114
Endrin	mg/kg	0.2	0.2	0.2	60 - 140	119
p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	105
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	96	100	60 - 140	96
OP Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420						
LB008508.002						
Dichlorvos	mg/kg	0.5	1.0	1.33	60 - 140	78
Diazinon (Dimpylate)	mg/kg	0.5	1.1	1.33	60 - 140	79
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.3	1.33	60 - 140	100
Ethion	mg/kg	0.2	1.1	1.33	60 - 140	84
Surrogates						
2-fluorobiphenyl (Surrogate)	%	-	94.0	100	60 - 120	94
d14-p-terphenyl (Surrogate)	%	-	110.0	100	60 - 140	110
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420						
LB008599.002						
Naphthalene	mg/kg	0.1	3.0	3.37	60 - 140	90
Acenaphthylene	mg/kg	0.1	3.0	3.37	60 - 140	90
Acenaphthene	mg/kg	0.1	3.6	3.37	60 - 140	106
Phenanthrene	mg/kg	0.1	3.3	3.37	60 - 140	97
Anthracene	mg/kg	0.1	3.2	3.37	60 - 140	96
Fluoranthene	mg/kg	0.1	3.3	3.37	60 - 140	96
Pyrene	mg/kg	0.1	3.4	3.37	60 - 140	101
Benzo(a)pyrene	mg/kg	0.1	3.2	3.37	60 - 140	94
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	82.0	100	60 - 140	82
2-fluorobiphenyl (Surrogate)	%	-	74.0	100	60 - 140	74
d14-p-terphenyl (Surrogate)	%	-	92.0	100	60 - 140	92
PCBs in Soil Method: ME-(AU)-[ENV]AN400/AN420						
LB008598.002						
Arochlor 1260	mg/kg	0.2	0.5	0.4	60 - 140	118
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	99	100	60 - 140	99

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022).
For more information refer to the footnotes in the concluding page of the report.
Recovery is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

	Control		LCS STD			
Parameter	Units	LOR	Result	Expected Result	Criteria %	Recovery %
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: ME-(AU)-[ENV]AN040/AN320						
LB008525.002						
Arsenic, As	mg/kg	3	51	50	80 - 120	101
Cadmium, Cd	mg/kg	0.3	51	50	80 - 120	103
Chromium, Cr	mg/kg	0.3	52	50	80 - 120	103
Copper, Cu	mg/kg	0.5	53	50	80 - 120	105
Lead, Pb	mg/kg	1	52	50	80 - 120	104
Nickel, Ni	mg/kg	0.5	52	50	80 - 120	103
Zinc, Zn	mg/kg	0.5	51	50	80 - 120	103
Trace Metals (Dissolved) in Water by ICPMS Method: ME-(AU)-[ENV]AN318						
LB008584.002						
Arsenic, As	µg/L	1	19	20	80 - 120	97
Cadmium, Cd	µg/L	0.1	20	20	80 - 120	98
Chromium, Cr	µg/L	1	20	20	80 - 120	100
Copper, Cu	µg/L	1	20	20	80 - 120	101
Lead, Pb	µg/L	1	20	20	80 - 120	100
Nickel, Ni	µg/L	1	21	20	80 - 120	104
Zinc, Zn	µg/L	1	20	20	80 - 120	101
TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403						
LB008503.002						
TRH C10-C14	mg/kg	20	47	40	60 - 140	118
TRH C15-C28	mg/kg	50	50	40	60 - 140	125
TRH C29-C36	mg/kg	50	<50	40	60 - 140	98
TRH (Total Recoverable Hydrocarbons) in Water Method: ME-(AU)-[ENV]AN403						
LB008493.002						
TRH C10-C14	µg/L	100	1200	1200	60 - 140	102
TRH C15-C28	µg/L	200	1400	1200	60 - 140	116
TRH C29-C36	µg/L	200	1300	1200	60 - 140	109
VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434						
LB008664.002						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	2.9	2.27	60 - 140	127
Toluene	mg/kg	0.1	3.0	2.27	60 - 140	133
Ethylbenzene	mg/kg	0.1	3.1	2.27	60 - 140	137
m/p-xylene	mg/kg	0.2	6.2	4.54	60 - 140	135
o-xylene	mg/kg	0.1	3.0	2.27	60 - 140	133
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	104.0	100	60 - 140	104
d4-1,2-dichloroethane (Surrogate)	%	-	106.0	100	60 - 140	106
d8-toluene (Surrogate)	%	-	100.0	100	60 - 140	100
Bromofluorobenzene (Surrogate)	%	-	97.0	100	60 - 140	97
VOCs in Water Method: ME-(AU)-[ENV]AN433/AN434						
LB008492.002						
Monocyclic Aromatic Hydrocarbons						
Benzene	µg/L	0.5	56	45.45	60 - 140	124
Toluene	µg/L	0.5	54	45.45	60 - 140	119
Ethylbenzene	µg/L	0.5	58	45.45	60 - 140	128
m/p-xylene	µg/L	1	110	90.9	60 - 140	121
o-xylene	µg/L	0.5	55	45.45	60 - 140	120
Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433/AN434						
LB008664.002						

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022).
For more information refer to the footnotes in the concluding page of the report.
Recovery is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Control	LCS STD			
Parameter	Units	LOR	Result	Expected Result	Criteria %	Recovery %
Continued... Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433/AN434						
LB008664.002						
TRH C6-C9	mg/kg	20	30	23	60 - 140	130
Volatile Petroleum Hydrocarbons in Water Method: ME-(AU)-[ENV]AN433/AN434						
LB008492.002						
TRH C6-C9	µg/L	40	960	827	60 - 140	116

Matrix spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of the report. Recovery is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Control	MS			
Parameter	Units	LOR	Result	Original Result	Spike Added	Recovery %
Mercury in Soil Method: ME-(AU)-[ENV]AN312						
LB008519.005						
Mercury	mg/kg	0.05	0.22	<0.05	0.2	104
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420						
LB008599.005						
Naphthalene	mg/kg	0.1	3.6	<0.1	3.37	107
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	NA
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	NA
Acenaphthylene	mg/kg	0.1	3.6	<0.1	3.37	106
Acenaphthene	mg/kg	0.1	3.9	<0.1	3.37	115
Fluorene	mg/kg	0.1	<0.1	<0.1	-	NA
Phenanthrene	mg/kg	0.1	3.5	<0.1	3.37	104
Anthracene	mg/kg	0.1	3.7	<0.1	3.37	111
Fluoranthene	mg/kg	0.1	3.7	<0.1	3.37	111
Pyrene	mg/kg	0.1	3.9	<0.1	3.37	116
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	NA
Chrysene	mg/kg	0.1	<0.1	<0.1	-	NA
Benzo(b)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	NA
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	NA
Benzo(a)pyrene	mg/kg	0.1	3.4	<0.1	3.37	101
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	NA
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	-	NA
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	NA
Total PAH	mg/kg	0.8	29	<0.8	-	NA
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	103.0	101.0	100	103
2-fluorobiphenyl (Surrogate)	%	-	101.0	88.0	100	101
d14-p-terphenyl (Surrogate)	%	-	114.0	113.0	100	114
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: ME-(AU)-[ENV]AN040/AN320						
LB008525.004						
Arsenic, As	mg/kg	3	50	4	50	92
Cadmium, Cd	mg/kg	0.3	45	<0.3	50	89
Chromium, Cr	mg/kg	0.3	59	12	50	92
Copper, Cu	mg/kg	0.5	73	28	50	90
Lead, Pb	mg/kg	1	49	7	50	85
Nickel, Ni	mg/kg	0.5	86	48	50	76
Zinc, Zn	mg/kg	0.5	77	33	50	88
VOCs in Water Method: ME-(AU)-[ENV]AN433/AN434						
LB008492.018						
Monocyclic Aromatic Hydrocarbons						
Benzene	µg/L	0.5	51	<0.5	45.45	112
Toluene	µg/L	0.5	51	<0.5	45.45	112
Ethylbenzene	µg/L	0.5	50	<0.5	45.45	110
m/p-xylene	µg/L	1	100	<1	90.9	112
o-xylene	µg/L	0.5	50	<0.5	45.45	111
Oxygenated Compounds						
MtBE (Methyl-tert-butyl ether)	µg/L	0.5	<0.5	<0.5	-	NA
Surrogates						
Dibromofluoromethane (Surrogate)	µg/L	-	98.0	102.0	-	98
d4-1,2-dichloroethane (Surrogate)	µg/L	-	109.0	115.0	-	109
d8-toluene (Surrogate)	µg/L	-	100.0	100.0	-	100
Bromofluorobenzene (Surrogate)	µg/L	-	99.0	99.0	-	99

Matrix spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of the report. Recovery is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

		Control	MS			
Parameter	Units	LOR	Result	Original Result	Spike Added	Recovery %
Volatile Petroleum Hydrocarbons in Water **Method: ME-(AU)-[ENV]AN433/AN434**						
LB008492.018						
TRH C6-C9	µg/L	40	800	<40	827	97
Surrogates						
Trifluorotoluene (Surrogate)	%	-	100.0	100.0	-	100

Matrix spike duplicates are calculated as relative percent difference using the formula RPD = | OriginalResult - ReplicateResult | x 100 / Mean
The original result is the analyte concentration of the matrix spike and the replicate result is the analyte concentration of the matrix spike duplicate.
The RPD is evaluated against the maximum allowable RPD criteria and can be graphically represented by a curve calculated from the statistical detection limit and limiting repeatability using the formula: MaxAllowableDifference = 100 x StatisticalDetectionLimit / Mean + LimitingRepeatability
RPD is shown in **Green** when within suggested criteria or **Bold** with an appended dagger symbol and Red† when outside suggested criteria.

No Matrix Spike Duplicates were required for this job.

FOOTNOTES

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
*	NATA Accreditation does not cover this analysis.
^	Performed by outside laboratory.
LOR	Limit of Reporting
QFH	QC result is above the upper tolerance
QFL	QC result is below the lower tolerance
NA	The sample was not analysed for this analyte

Samples analysed as received.
Solid samples expressed on a dry weight basis.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf

ANALYTICAL REPORT

CLIENT DETAILS

Contact	Anthony Barkway
Client	Environmental Investigations
Address	17 / 1A Coulson Street Erskineville NSW 2043
Telephone	02 9516 0722
Facsimile	02 9516 0741
Email	anthony.barkway@eiaustralia.com.au
Project	**E1481.1 - Miranda NSW**
Order Number	(Not specified)
Samples	14

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	SE103158 R0
Report Number	0000011654
Date Reported	14/11/2011 1:10:45PM
Date Received	09 Nov 2011

COMMENTS

The document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

Site: 84-86 Kiora Rd, Miranda NSW

No respirable fibres detected using trace analysis technique.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

Andy Sutton
Organics Chemist

Dong Liang
Inorganics Metals Team Leader

Huong Crawford
Laboratory Manager

Ravee Sivasubramaniam
Hygienist

ANALYTICAL REPORT

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w
SE103158.008	BH1-1_ZLB	Soil	148g Soil,rocks	08 Nov 2011	No Asbestos Found Organic Fibres Detected	<0.01
SE103158.009	BH2-1_ZLB	Soil	220g Soil,rocks	08 Nov 2011	No Asbestos Found Organic Fibres Detected	<0.01
SE103158.010	BH3-1_ZLB	Soil	152g Soil,rocks	08 Nov 2011	No Asbestos Found Organic Fibres Detected	<0.01
SE103158.011	BH4-1_ZLB	Soil	158g Soil,rocks	08 Nov 2011	No Asbestos Found Organic Fibres Detected	<0.01
SE103158.012	BH5-1_ZLB	Soil	200g Soil,rocks	08 Nov 2011	No Asbestos Found Organic Fibres Detected	<0.01

METHOD SUMMARY

SE103158 R0

METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible.

FOOTNOTES

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed Not Required
Crocidolite	-	Blue Asbestos	*	-	Not Accredited

AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:
"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."

This report does not comply with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment and Remediation and Management of Asbestos Contaminated sites in Western Australia - May 2009.

Sampled by the client

Where reported: 'Asbestos Detected':
Asbestos detected by polarized light microscopy, including dispersion staining

Where reported: 'No Asbestos Found':
No Asbestos Found by polarized light microscopy, including dispersion staining

Where reported: 'UMF Detected':
Mineral fibres of unknown type detected by polarized light microscopy, including dispersion staining.
Confirmation by another independent analytical technique may be necessary

Even after disintegration it can be very difficult, or impossible, to detect the presence of asbestos in some asbestos-containing bulk materials using polarised light microscopy.
This is due to the low grade or small length or diameter of asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf

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CERTIFICATE OF ANALYSIS 64679

Client:

Environmental Investigations
17/1A Coulson St
Erskineville
NSW 2043

Attention: Anthony Barkaway

Sample log in details:

Your Reference:	**E1481.1, Miranda**		
No. of samples:	1 soil		
Date samples received / completed instructions received	09/11/11	/	09/11/11

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	16/11/11	/	14/11/11
Date of Preliminary Report:	Not issued		

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

sTRH in Soil (C10-C36)		
Our Reference:	UNITS	64679-1
Your Reference	----------	l1
Date Sampled	----------	08/11/2011
Type of sample		soil
Date extracted	-	10/11/2011
Date analysed	-	11/11/2011
$TRHC_{10}$ - C_{14}	mg/kg	<50
$TRHC_{15}$ - C_{28}	mg/kg	<100
$TRHC_{29}$ - C_{36}	mg/kg	<100
Surrogate o-Terphenyl	%	103

Acid Extractable metals in soil		
Our Reference:	UNITS	64679-1
Your Reference	----------	l1
Date Sampled	----------	08/11/2011
Type of sample		soil
Date digested	-	10/11/2011
Date analysed	-	11/11/2011
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.5
Chromium	mg/kg	13
Copper	mg/kg	14
Lead	mg/kg	7
Mercury	mg/kg	<0.1
Nickel	mg/kg	19
Zinc	mg/kg	16

Moisture		
Our Reference:	UNITS	64679-1
Your Reference	----------	l1
Date Sampled	----------	08/11/2011
Type of sample		soil
Date prepared	-	10/11/2011
Date analysed	-	11/11/2011
Moisture	%	10

Method ID	Methodology Summary
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/11/2011	[NT]	[NT]	LCS-7	10/11/2011
Date analysed	-			11/11/2011	[NT]	[NT]	LCS-7	11/11/2011
$TRHC_{10}$ - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-7	97%
$TRHC_{15}$ - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-7	106%
$TRHC_{29}$ - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-7	107%
Surrogate o-Terphenyl	%		Org-003	104	[NT]	[NT]	LCS-7	101%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			10/11/2011	[NT]	[NT]	LCS-1	10/11/2011
Date analysed	-			11/11/2011	[NT]	[NT]	LCS-1	11/11/2011
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-1	100%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-1	107%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	102%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	106%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	101%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-1	117%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	103%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	103%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.