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Project 85126.02
10 April 2017
85126.02.R.001
DW:jlb

Bettergrow Pty Ltd
c/- RPS Australia East Pty Ltd
PO Box 428
Hamilton NSW 2303

Attention: Mr Shaun Smith

Email: shaun.smith@rpsgroup.com.au

Dear Sirs

Response to Request for Information Regarding Contamination
Proposed Resource Recovery & Recycling Facility
24 Davis Road, Wetherill Park, NSW

1. Introduction

It is understood that the Department of Planning and Environment (DPE) has reviewed the information provided in Douglas Partners Pty Ltd (DP), *Review of Contamination Reports, Proposed Resource Recovery & Recycling Centre, 24 Davis Road, Wetherill Park, NSW,* 19 October 2015 (Project 85126.00) [DP, (2015)]. It is also understood that DPE is concerned that contamination is present at the site and it is not fully understood and remediated and would like to know why the site is considered to be appropriate for use as a resource recovery and recycling facility. This letter has been prepared to provide further information as to the suitability of the site with regards to the proposed resource recovery and recycling facility development.

In addition to providing further information, this letter provides an Unexpected Finds Protocol (UFP) which was recommended in DP (2015).

2. Further Information

A Site Audit Statement or Remediation Action Plan was not included in the reports reviewed by DP, however, remediation works have been undertaken at the site and were reported in URS (2013b). The documented remediation works included the removal of three above-ground storage tanks (ASTs) and associated pipework; the removal of two partial underground storage tanks (USTs); the removal of two interceptor pits and associated pipework; classification of soil from seven excavations for either off-site disposal or re-use. According to URS, all identified fuel infrastructure at the site, with the exception of one interceptor pit was excavated and removed.

Prior to the remediation works noted above, detailed investigations of soil and groundwater were undertaken by URS. This included:

- Drilling of 31 soil bores in 2005;
- Test pitting at locations where possible USTs could be present;
- The drilling of 29 soil bores in 2012; and
- Four groundwater monitoring events between 2005 and 2012 from 13 groundwater monitoring wells.

It was considered by URS that the remedial works (for soil) completed as part of URS (2013b) removed any remaining sources/impacts that had been identified in previous site investigations. As groundwater was not reported to be impacted by the chemicals of potential concern above the groundwater acceptance criteria with the exception of heavy metals, it was considered by URS that the risks to human health and the environment are low and acceptable. Due to the widespread nature of the detections it was considered by URS that the detected heavy metals in the groundwater beneath the site are indicative of local groundwater quality.

As stated in DP (2015), the primary guidance for the assessment of contaminated sites has changed since URS completed their investigations and validation reports. In this regard, current investigations and screening levels [from National Environmental Protection Council, *National Environmental Protection (Assessment of Site Contamination) Measure, 1999 amended 2013* (NEPC, 2013)] for concentrations of contaminants for a non-sensitive site use (such as a resource recovery and recycling centre) tend to be less conservative than those which were used by URS, particularly for petroleum hydrocarbons. It is therefore, reasonable to assume that the remediation works to address petroleum hydrocarbons in soil were undertaken to meet more stringent criteria than the investigation and screening levels presented in NEPC (2013).

Given the remediation works documented by URS, the detailed nature of previous soil and groundwater investigations, and the current guidelines it is considered by DP that the likelihood of widespread contamination existing at the site is very low. Given this, limited/targeted soil investigation (instead of a detailed investigation) has been recommended in DP (2015) as a 'check' and to address data gaps including at workshop and laboratory buildings, existing interceptor pit and future landscape areas which cover a relatively minor part of the entire site area. It is considered by DP that the site is suitable for the proposed resource recovery and recycling facility subject to these limited/targeted soil investigations and adoption of an unexpected finds protocol (see Section 3) for in ground works for the proposed development.

3. Unexpected Finds Protocol

3.1 UFP for Buried UST or Similar Infrastructure

As there was some uncertainty about the total number and status of USTs (URS, 2006), there is the possibility of USTs or similar buried structures to exist between investigated locations. In the event that a UST or similar buried structure is encountered during site works, the UST or structure and any associated pipework should be managed / removed as follows:

- Upon discovery of the structure, the site foreman is to be notified and the area barricaded;

- If deemed achievable, a qualified contractor is to remove and dispose of any stored liquid, the structure and associated pipework. In the case of an UST, the tank must be removed in accordance with Australian Standard AS 4976 – 2008 *The Removal and Disposal of Petroleum Underground Storage Tanks* and WorkCover NSW, *Code of Practice: Storage and Handling of Dangerous Goods*, 2005;
- Excavate and stockpile impacted soils (based on field observations);
- Validation of the tank pit by a qualified environmental consultant through soil sampling and laboratory analysis for the contaminants of concern;
- If required, "chase out" all of soils in the tank pit identified to be impacted by the contaminants of concern and further validation sampling and analysis as required to assess appropriate removal of impacted soils;
- The environmental consultant is to sample and assess stockpiled soils for waste classification and / or possible re-use; and
- Inclusion of validation results, waste classification information and disposal documents (including liquid waste disposal dockets, landfill dockets and, in the case of USTs, tank and pipe work destruction certificates) in a validation report. According to Clause 15 of the *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2014*, if a storage system is decommissioned, the validation report must be served to the relevant local authority within 60 days of decommissioning.

It is noted that the identification of contaminated soil associated with a UST may trigger the need for a groundwater assessment. At the time of preparing this document, NSW EPA, *Technical Note: Investigation of Service Station Sites,* 2014 is applicable to the assessment of a tank pit.

3.2 UFP for Asbestos

If potential asbestos containing materials (ACM) in soil are detected in unexpected areas prior to, or during, site development works, the following unexpected finds protocol will apply:

- Upon discovery of suspected asbestos containing material, the site manager is to be notified and the affected area closed off by the use of barrier tape and warning signs. Warning signs shall be specific to Asbestos Hazards and shall comply with the Australian Standard 1319-1994 – Safety Signs for the occupational environment;
- A licensed asbestos assessor (or competent person) is to be notified to inspect the area and confirm the presence of asbestos and to determine the extent of remediation works to be undertaken. A report detailing this information would be compiled by the licensed asbestos assessor (or competent person) and provided to the site manager;
- If the impacted soil is to be disposed off-site, it should be classified in accordance with the NSW EPA's *Waste Classification Guidelines* 2014 and disposed of, as a minimum, as asbestos contaminated waste to a landfill licensed to receive such waste. If soils are dry, the soil would be lightly wetted and/or covered with plastic sheet whilst awaiting disposal;
- Based on the report by the licensed asbestos assessor (or competent person), all work associated with the removal of asbestos contaminated soil would be undertaken by a licensed contractor. SafeWork NSW must be notified at least 5 days in advance of any asbestos removal works;

- Depending on the report by the licensed asbestos assessor (or competent person), monitoring for airborne asbestos fibres is to be carried out during the soil excavation in asbestos contaminated materials;
- At the completion of the excavation, a clearance inspection is to be carried out and written certification is to be provided by the licenced asbestos assessor (or competent person) that the area is safe to be accessed and worked. If required, the filling remaining in the inspected area can be covered/ sealed by an appropriate physical barrier layer of non-asbestos containing material prior to sign–off;
- Details of the works are to be recorded in the site record system; and
- Following clearance by the licenced asbestos assessor (or competent person), the area may be reopened for further excavation or construction work.

WorkCover NSW, *Managing Asbestos in or on Soil*, March 2014 provides further guidance with regards to asbestos in or on soil.

3.3 General UFP for Other Signs of Contamination

In the case that signs of contamination (other than asbestos) such as odours and staining of soils are encountered during site works, the general unexpected finds protocol will apply:

- A qualified environmental consultant will inspect the potential area of environmental concern and determine the nature of the issue, whether it comprises an area of an environmental concern (AEC), and the appropriate approach to assessing or (if appropriate) managing the issue;
- The environmental consultant will undertake an assessment considered necessary to determine the management strategy for the AEC;
- If contamination is found and remediation action is considered necessary, a remediation strategy for the AEC will be prepared by the environmental consultant. The remediation strategy is to be implemented by a qualified contractor; and
- Any remediation works are to be validated by the environmental consultant and documented in a validation report.

4. Conclusion

Based on the documented investigations and validation of remediation from URS, it is considered by DP that the likelihood of widespread contamination existing at the site is very low. An UFP has been provided herein to address ‘unknown’ contamination encountered during site development which may exist in between sampled/investigated locations. It is considered by DP that the site is suitable for the proposed resource recovery and recycling facility, a non-sensitive land-use, subject to limited/targeted soil investigations recommended in DP (2015) and adoption of the UFP provided in Section 3.

5. References (URS Reports)

- URS, *Phase 2 Environmental Site Assessment, Emoleum Depot, 24 Davis Road, Wetherill Park, NSW*, 2006 (reference 42423822) (URS, 2006);
- URS, *Final Report, Annual Groundwater Monitoring Event October 2008, Former Emoleum Depot*, 24 Davis Road, Wetherill Park NSW, 2010 (reference 42424135) (URS, 2010); and
- URS, *Annual Groundwater Monitoring Event, Former Mobil Emoleum Depot (Site No. 6F01), 24 Davis Road, Wetherill Park NSW*, 2012 (reference 42424273/01/01) (URS, 2012a);
- URS, *Post Phase 2 Environmental Site Assessment, Former Mobil Depot Wetherill Park (6F01), 24 Davis Road, Wetherill Park* (reference 42424436) (URS, 2012b);
- URS, *Dilapidation Survey, 24 Davis Road, Wetherill Park,* 2012 (reference 42424436) (URS 2012c);
- URS, *Hazardous Building Materials Survey, Former Mobil Emoleum Depot, 24 Davis Road, Wetherill Park NSW* (reference 42424436), 2012 (URS, 2012d);
- URS, *Post Phase 2 Environmental Site Assessment, Former Mobil Depot Wetherill Park (6F01), 24 Davis Road, Wetherill Park,* 2012 (reference 42424444) (URS, 2012e);
- URS, *Letter Report – Groundwater Monitoring Well Decommissioning, Former Emoleum Depot, Wetherill Park NSW (6F01)* (reference 42424443), 2013 (URS, 2013a);
- URS, *Soil Validation Report, Former Emoleum Depot (6F01), 24 Davis Road, Wetherill Park, NSW* (reference 4242443), 2013 (URS, 2013b).
- URS, *Environmental Summary Report*, *Former Emoleum Depot (6F01), 24 Davis Road, Wetherill Park, NSW,* 2 May 2013 (reference 42424443) (URS, 2013c).

6. Limitations

Douglas Partners (DP) has prepared this report for this project at 24 Davis Road, Wetherill Park in general accordance with DP's email dated 3 April 2017 and acceptance (email) received from Shaun Smith of RPS Australia Asia Pacific on 4 April 2017, acting on behalf of Bettergrow Pty Ltd. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Bettergrow Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the locations accessible during the site inspection. The advice may also be limited by budget constraints imposed by others or by site accessibility

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk.

Please contact either of the undersigned for clarification of the above as necessary.

Yours faithfully
Douglas Partners Pty Ltd

David Walker
Environmental Engineer / Associate

Reviewed by

Paul Gorman
Principal

Attachment: About this Report

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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Project 85126.00
19 October 2015
DW:jlb

Bettergrow Pty Ltd
c/- RPS Australia East Pty Ltd
PO Box 428
Hamilton NSW 2303

Attention: Mr Shaun Smith

Email: shaun.smith@rpsgroup.com.au

Dear Sirs

Review of Contamination Reports
Proposed Resource Recovery & Recycling Centre
24 Davis Road, Wetherill Park, NSW

1. Introduction

This report provides comments from a review of contamination related reports prepared by URS Australia Pty Ltd (URS) for the abovementioned site. The report review, as well as a site visit, was commissioned by Mr Neil Schembri of Bettergrow Pty Ltd to provide information for a Statement of Environmental Effects (SEE) for the development and operation of a proposed Resource Recovery and Recycling Centre. The operation will be designed to cater for 30,000 tonnes of waste handling and processing per annum. RPS Australia East Pty Ltd (RPS) is to prepare the SEE.

The site is Lot 18 Deposited Plan 249417 and was previously used for production of asphalt, and some of the site buildings, hardstand, materials bays, and containment areas still exist from this previous use. It is understood that these features of the site will be used for the proposed operations and current site levels will not to be altered. The site covers approximately 2.0 ha.

2. Reports for Review

URS was commissioned by Mobil Oil Australia Pty Ltd to prepare the report:

- *Environmental Summary Report*, *Former Emoleum Depot (6F01), 24 Davis Road, Wetherill Park, NSW,* 2 May 2013 (reference 42424443) (URS, 2013c).

The summary report (URS, 2013c) presents the findings of previous investigations undertaken at the site, with the view to providing a statement on the site soil and groundwater quality with respect to the future industrial or commercial site use. The summary report as well as the following previous reports (attached to URS, 2013c) were reviewed by DP:

- URS, *Phase 2 Environmental Site Assessment, Emoleum Depot, 24 Davis Road, Wetherill Park, NSW*, 2006 (reference 42423822) (URS, 2006);

- URS, *Final Report, Annual Groundwater Monitoring Event October 2008, Former Emoleum Depot*, 24 Davis Road, Wetherill Park NSW, 2010 (reference 42424135) (URS, 2010); and
- URS, *Annual Groundwater Monitoring Event, Former Mobil Emoleum Depot (Site No. 6F01), 24 Davis Road, Wetherill Park NSW*, 2012 (reference 42424273/01/01) (URS, 2012a);
- URS, *Post Phase 2 Environmental Site Assessment, Former Mobil Depot Wetherill Park (6F01), 24 Davis Road, Wetherill Park* (reference 42424436) (URS, 2012b);
- URS, *Dilapidation Survey, 24 Davis Road, Wetherill Park,* 2012 (reference 42424436) (URS 2012c);
- URS, *Hazardous Building Materials Survey, Former Mobil Emoleum Depot, 24 Davis Road, Wetherill Park NSW* (reference 42424436), 2012 (URS, 2012d);
- URS, *Post Phase 2 Environmental Site Assessment, Former Mobil Depot Wetherill Park (6F01), 24 Davis Road, Wetherill Park,* 2012 (reference 42424444) (URS, 2012e);
- URS, *Letter Report – Groundwater Monitoring Well Decommissioning, Former Emoleum Depot, Wetherill Park NSW (6F01)* (reference 42424443), 2013 (URS, 2013a);
- URS, *Soil Validation Report, Former Emoleum Depot (6F01), 24 Davis Road, Wetherill Park, NSW* (reference 4242443), 2013 (URS, 2013b).

A summary of the above listed reports are provided in the subsections below.

2.1 Phase 2 Environmental Site Assessment (URS, 2006)

The scope for the Phase 2 Environmental Site Assessment (ESA) included soil sampling from 32 test bores (SB14 to SB32 and MW01 to MW13) and installation and sampling of 13 groundwater monitoring wells (MW01 to MW13). Fieldwork was completed in 2005. Figure 3 from URS, 2013c is attached and shows the sample locations as well as site features.

The site was described by URS to be rectangular in shape and slope moderately steeply from the northern boundary down to Davis Road. The site appeared to have been levelled for construction. Based on the geology encountered during the drilling, URS inferred that the site levelling was from cutting, rather than filling the site. The site had three main levels:

- Upper Hard Stand Area (higher level) at the northern portion:
- Bulk Storage level (middle level) located at the centre of the site; and
- Manufacturing level (lower level) located in the southern portion of the site.

Previous investigations are listed in URS, 2006 as:

- URS, *Phase 1 Environmental Site Assessment*, 2004 (URS, 2004); and
- Dames and Moore, *Mobil Site Audit Assessment Form*, 1990 (Dames & Moore, 1990).

The executive summary (only) from URS, 2004 was included as Appendix B1 in URS, 2006. According to the executive summary, the site was vacant and possibly used for rural purposes (e.g. grazing) until about 1978. From that time (to 2004) the site was used as an asphalt batching plant. The asphalt manufacturing process comprised mixing aggregate materials with hot bitumen, diesel (possibly kerosene in the past) and emulsion. Chemicals potentially associated with the current and historical site use were listed to include:

- Polycyclic aromatic hydrocarbons (PAH) associated with storage and handling of bitumen;
- Total petroleum hydrocarbons (TPH); benzene, toluene, ethylbenzene and xylenes (BTEX); and PAH associated with the storage and handling of bitumen emulsifiers including diesel and possibly previously kerosene;
- TPH and BTEX associate with former storage and handling of petroleum fuels and possibly kerosene in USTs;
- TPH, BTEX and PAH associated with wastewater collected in two or three triple/oil interceptor traps/pits;
- TPH and PAH associated with stockpiling of asphalt outside on unpaved, uncovered areas (e.g. behind the laboratory). However, TPH and PAH contained in asphalt are relatively immobile;
- Organochlorine pesticides (OCP) and organophosphorus pesticides (OPP) associated with potential vegetation control.

Only two pages (1 to 2) and a sketch from Dames & Moore, 1990 was included in Appendix B2 in URS, 2006. The sketch is attached. It was considered by Dames & Moore that the site had a high potential for significant environmental contamination. Some of the reasons for this assessment included:

- Concentrations of contaminants in soil exceed the guideline concentrations for organic contaminants at locations 704-10 (at the solvent wash area) and 704-13 (near “tank 15” next to the workshop) up to a depth of 1.0 m;
- There have been reported spills of bitumen, which had been reportedly cleaned up. Also reported and observed was continued spillage of waste oil from tank 15. Product imbalances from tank 15 were unknown. The bund around tank 15 contained substantial waste oil, which was leaking from the bund area; and
- Significant surficial contamination was observed around various areas of the site including around the bitumen plant, bowsers and other working trafficked areas.

A list of on-site fuel/chemical storage tanks (sourced from URS, 2004), either present, disused or removed by 2004, was provided in URS, 2006. These included:

- Nine aboveground tanks for bitumen;
- One aboveground tank for diesel;
- One aboveground emulsion tank;
- One aboveground asfaltrent tank;

- One aboveground wastewater tank (from truck Wash Bay);
- Two in-ground recycled water tanks;
- One abandoned former underground tank for flammable liquid (filled with sand in 2001);
- One aboveground LPG tank;
- Two underground tanks formerly used for petrol;
- Two underground tanks formally used for diesel; and
- One underground tank formerly used for kerosene.

Some uncertainty as to the total number and status of underground tanks that had been used at the site was noted by URS.

URS positioned soil bores to target potential contamination sources identified in URS, 2004 and noted that the 32 test locations were slightly in excess of the minimum of 30 sampling locations recommended by NSW EPA for a 2 ha site. Non Destructive Digging (NDD) was used to 1.2 m below ground level (bgl). Boreholes were drilled to between 3.1 m bgl and 10.2 b bgl. Wells were installed to depths of between 5.5.m bgl and 10.2 m bgl. One round of groundwater sampling was undertaken.

Beneath a surface layer of grass, concrete or asphalt, filling was encountered to depths of up to 2.4 m bgl. Filling was underlain by silty clay and weathered shale and siltstone. Screening for Volatile Organic Compounds (VOC) using a photoionisation detector on soil samples indicated an absence of VOC in soil. Hydrocarbon odours were not encountered in the soil samples.

Groundwater flow was inferred to be in a south-easterly direction toward an unnamed tributary of Prospect Creek.

Selected soil samples were analysed for total petroleum hydrocarbons (TPH); benzene, toluene, ethylbenzene, and xylene (BTEX); polycyclic aromatic hydrocarbons (PAH); phenols; metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, vanadium and zinc); and volatile chlorinated hydrocarbons (VCH). Selected groundwater samples were analysed for TPH, BTEX, PAH, phenols, metals, total organic carbon (TOC), dissolved methane, nitrate, sulphate, ferrous iron and ferric iron.

The site investigation levels (or site assessment criteria) were obtained from:

- National Environment Protection Council (NEPC), *National Environment Protection (Assessment of Site Contamination) Measure,* 1999 (NEPC, 1999), Health Based Investigation Levels for commercial/industrial sites;
- NSW EPA, Guidelines for Assessing Service Station Sites, 1994 (NSW EPA, 1994);
- ANZECC and ARMCANZ (2000), *National Water Quality Management Strategy, "Australian Water Quality Guidelines for the protection of Aquatic Ecosystems"* trigger values for fresh water ecosystems (ANZECC and ARMCANZ, 2000).

Concentrations of TPH C_{10}-C_{36} in soil were above the adopted investigation level (1000 mg/kg) in two samples from MW13 at depth 0.1-0.2 m bgl (4970 mg/kg) and SB24 at depth 0.1 m bgl (3450 mg/kg).

TPH C_{10}-C_{36} was also detected at SB22, SB25, SB28, SB29 and SB25 but at concentrations below the site investigation levels.

Concentrations of TPH C_6-C_9, PAH, benzo(a)pyrene, BTEX, metals and phenols in soil were within the site investigation levels (where applicable).

Elevated concentrations of PAH were encountered in groundwater at MW08. Elevated concentrations of some metals (including cadmium, chromium, lead, nickel, copper and zinc) were encountered in several wells across the site. TPH, BTEX and VCH were not detected in groundwater samples. Phased separated hydrocarbons were not encountered in any well.

Potential primary sources of hydrocarbon impacts detected in soil and groundwater at and surrounding the site, were considered by URS to comprise:

- The current and former bitumen aboveground storage tanks (ASTs), and associated infrastructure;
- The diesel, kerosene and waste oil ASTs on the site and associated infrastructure;
- The residual fuels potentially contained in the fill and sand around the two decommissioned underground storage tanks (USTs) and former tanks;
- The possible disused diesel and kerosene UST's and associated underground fuel lines in the vicinity of the aforementioned USTs.

Potential secondary were considered to include:

- The two or three triple/oil interceptor traps/pits;
- Spills and leaks from the former fuel dispenser associated with the USTs and former "truck oil up stand";
- Spills and leaks from the two bitumen tank farms and unloading points;
- Stockpiling of asphalt and Cold Mix on unpaved area; and
- Minor stockpiling of asphalt behind the site laboratory.

Other sources of impact proximal to the site that were identified included oils, fuels and solvents potentially being stored on the metal recycling depot located adjacent the western boundary (across gradient) and oils / fuels potentially being stored on the industrial units located to the east (across gradient).

URS considered that the hydrocarbon impact identified in soil may have been a result of diesel and/ or oils given the elevated concentrations of TPH C_{10}-C_{36}. A potential source of the PAH identified in groundwater at MW08 may have been the former bitumen tanks and the possible former fuel USTs located in the hard stand area to the north.

URS considered a potential source of the metals in groundwater may be from fill across the site, although relatively low concentrations were detected in soils. The metal recycling facility located to west may be a source although this facility is hydraulically cross gradient. The concentrations of metals in groundwater may be a result of the local groundwater quality.

2.2 Groundwater Monitoring Event in 2008 (URS, 2010)

The scope of the URS, 2010 investigation included gauging, purging and sampling of 13 existing on-site monitoring wells (MW01 to MW13) in October 2008 as well laboratory analysis of groundwater samples. The purpose of the groundwater monitoring event was to:

- Investigate the nature, extent and sources of petroleum hydrocarbon impacts in groundwater;
- Evaluate temporal and spatial changes in the distribution of any identified groundwater impacts since the sampling undertaken for URS, 2006;
- Evaluate possible routes of migration of any identified groundwater impacts;
- To qualitatively assess the potential risks that the identified contaminants may pose to human and environmental receptors;

It was noted that the site was decommissioned prior to groundwater monitoring and subsequent to the investigation for URS, 2006.

No phase separated hydrocarbons were encountered in any of the wells whilst sampling.

Samples from each well were analysed for TPH, BTEX, PAH, phenolic compounds, metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, vanadium and zinc) and VCH. The site investigation levels (or site assessment criteria) were obtained from NSW EPA, 1994; ANZECC and ARMCANZ, 2000; and National *Health and Medical Research Council and National Resource Management Ministerial Council, National Water Quality Management Strategy, Australian Drinking Water Guidelines*, 2004 (NHMRC, 2004).

TPH C_{10}-C_{36} was detected in groundwater samples from MW07 (100 µg/L), located in the vicinity of the asphalt batching plant and down gradient of the former "truck oil stand", and MW09 (200 µg/L), located down gradient of the former fuel USTs located in the hard stand area in the northern portion of the site. These TPH impacts were considered by URS to be associated with the former operations and / or infrastructure adjacent these locations; however, they may indicate the presence of a localised dissolve phase hydrocarbon plume encompassing the western portion of the Bulk Storage Level.

TPH C_{10}-C_{36} was also detected in the groundwater sample from monitoring well MW02 (730 µg/L), located down gradient near the southern site boundary and south of the offices and weighbridge. No immediate up-gradient groundwater impact was identified, and URS considered that the source of the impact was likely localised to the vicinity of MW02.

Concentrations of TPH C_6-C_9 and BTEX were below the laboratory limits of reporting (LOR) for all samples.

Concentrations of PAH were reported below the LOR for all wells except for MW02 which had a total PAH of 1.6 µg/L. This was below the adopted investigation level of 3 µg/L. Phenols and VCH were at concentrations below the LOR.

Lead concentrations were below the adopted investigation level. Elevated concentrations of some metals (arsenic, cadmium, chromium, copper, zinc and nickel) were reported in several wells but these were considered by URS to be likely indicative of background levels present in local groundwater.

A comparison of the groundwater analytical results was made by URS to those from URS, 2006. It was noted that:

- No TPH was detected above the LOR in sampling for URS, 2006, however, TPH C_{10}-C_{36} was detected at three wells in the monitoring event for URS, 2010;
- Lead concentrations had decreased to or remained at less than they LOR. Concentrations of other metals generally remained constant or had decreased with the exception of chromium and zinc concentrations in MW008 which had increased; and
- Total PAH had increased at MW02 but decreased at MW07.

2.3 Groundwater Monitoring Event in 2010 (URS, 2012a)

The scope of URS, 2012a included gauging, purging and sampling of 13 existing groundwater wells (MW01 to MW13) as well laboratory analysis in March 2010. The purpose of the groundwater monitoring event was similar to that for URS, 2010.

No phase separated hydrocarbons were encountered in any of the wells whilst sampling. No hydrocarbon odour or sheen was observed in the groundwater purged from the wells. PID readings were 0.0 ppm at each of the well heads except at MW06 where a PID reading of 7.9 ppm was recorded.

Samples from each well were analysed for TPH, BTEX, PAH, phenolic compounds, metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, vanadium and zinc) and VCH. The site investigation levels were obtained from NSW EPA, 1994 and ANZECC and ARMCANZ, 2000. Silica gel clean-up was used to analyse TPH (C_{10}-C_{36}) for the sample collected from MW02 (and the silica gel clean up value was used by URS for the assessment).

TPH C_{10}-C_{36} was detected in samples from MW03 (160 µg/L) and MW09 (240 µg/L). MW09 is located in the hard stand area in the northern portion of the site down gradient of the former kerosene UST. The TPH impact at MW09 was considered by URS to be localised as it was not detected in down gradient or up gradient wells. MW03 is located down gradient near the southern boundary and it was considered by URS that the impact was localised.

Phenanthrene (a PAH compound) was detected in the groundwater sample from MW02 (1.4 µg/L) and phenol was detected in the sample from MW08 (1.4 µg/L). These were considered by URS to be localised impacts as no immediate up-gradient impacts were identified.

VCH was not detected above the LOR in all groundwater samples.

Concentrations of metals (including arsenic, copper, nickel, and zinc) were greater than the adopted investigation levels in several wells. The concentrations of metals were considered by URS to be indicative of background levels.

It was considered by URS that from the three groundwater monitoring events since 2005 (as reported in the subsections above) the concentrations of the analysed contaminants in groundwater had remained relatively steady.

2.4 Post Phase 2 Environmental Site Assessment (URS, 2012b)

URS, 2012b presents the results of a Post Phase 2 Environmental Site Assessment, the purpose of which was:

- To determine the number and condition of historically recorded USTs and associated infrastructure in two areas of the site (Area 1 and Area 2);
- To investigate the nature, extent and sources of petroleum impacts within the soil with the two areas;
- To assess the potential risks that the identified contaminants may pose to human and environmental receptors.

The scope of the investigation included test pitting to determine the number of USTs (if any) in both areas and to determine if any USTs have been decommissioned *in situ*. Soil samples were collected from targeted locations and were subject to analysis. The locations of the two investigations areas are indicated on Figure 3 from URS, 2013, attached. Figures 5A and 5b from URS, 2012b are also attached and show the configuration of the test pits at each investigation area.

At the time of the investigation (March/April 2012), observed remaining infrastructure included:

- An oil interceptor pit, three ASTs and associated pipes, one UST and associated remnant pipes at the Upper Hard Stand Area (higher level of site);
- An oil interceptor pit and associated pipes in the Bulk Storage Level (middle level); and
- An oil-water interceptor, two underground recycled water tanks, a triple interceptor, mechanical work pit in the work shop, and an apparent redundant substation at the Manufacturing Level (lower level).

A total of 15 test pits (TP1 to 12, TP13A, TP 13B and TP 14) were excavated to depths ranging from 0.4 m to 1.5 m. TP1 to TP7 were excavated at Area 1 and the remainder were excavated at Area 2. The test pits were positioned based on the findings of historical site plans and a previous ground penetrating radar (GPR) survey which identified possible ground disturbance in both areas.

At Area 1, asphalt was underlain by up to 1 m of sand and gravel fill which was underlain by natural brown to white clay. Hydrocarbon odours and brown to black staining were detected in TP1, TP2, TP3 and TP4. Perched groundwater was encountered at 0.5 m in TP1 to TP3. A hydrocarbon odour was detected at TP6.

At Area 2, asphalt, concrete or grass was underlain by fill comprising various compositions of clay, sand and gravel to a depth of up to 1.2 m. Natural clay or clayey sand was encountered in each test pit. Fill was recorded to a depth of 1.2 m at TP11 which indicated, along with surface concrete scarring, that an in-filled tank pit was present in that area. The presence of a UST filled with sand and

gravel was recorded in TP13a. Perched water was observed in TP13a. Fuel lines were encountered at TP12.

PID readings above 5 ppm were noted in samples from TP1, TP2, TP3, TP4, TP5, TP6, TP7 and TP13A.

Thirteen selected (primary) samples were analysed for TPH, BTEX, PAH, lead and phenols. Soil Acceptance Criteria (SAC) were adopted from NEPC, 1999 and NSW EPA, 1994.

BTEX concentrations were below the LOR in all samples. Concentrations of TRH C_6-C_9 were within the SAC for all samples, although this TRH fraction was detected in two samples (from TP4 and TP6).

Concentrations of TPH (C_{10}-C_{36}) exceeded the SAC in two samples (2800 mg/kg in TP2, depth 0.8m and 11500 mg/kg in TP4, depth 0.3 m). This TPH fraction was also detected in three other samples (at concentrations below the SAC).

Concentrations of lead and PAH, although detected in some samples, were within the soil acceptance criteria. Phenolic compounds were at concentrations below the LOR.

The heavy end TRH impacts at Area 1 were noted by URS to be predominantly in the fill or at the interface between the fill and natural soil (at a maximum depth of 1 m). The visually impacted perched water encountered in this area may be the source of the soil impacts. The impacts were considered to be delineated to the west and north of this area.

2.5 Dilapidation Survey (URS, 2012c)

URS, 2012c provides a dilapidation survey of the site which was conducted on 21 June 2012. This survey does not provide contamination-related information and, therefore, is not further discussed herein.

2.6 Hazardous Building Materials Survey (URS, 2012d)

URS, 2012d provides the results of a hazardous building materials survey of the site conducted in March 2012. Hibbs & Associates Pty Ltd conducted the survey (as contracted by URS) which was reported in:

- Hibbs & Associates Pty Ltd, *Final Report for Hazardous Materials Survey, Former Emoleum Depot, David Road, Wetherill Park NSW 2164,* (reference S6572) 2012 (Hibbs & Associates, 2012).

Hibbs & Associates, 2012 was attached to URS, 2012d.

Asbestos was identified in a flange gasket on a section of a redundant pipe on the ground surface on the north-eastern side of the site. An asbestos containing electrical backing board was observed on the ground surface adjacent to the redundant electrical mains workshop (or former substation). Asbestos cement sheeting was also located in buildings.

Lead based paint was not identified in the survey.

Light fittings were assumed to contain PCB. The electrical transformer located at the external north side of the amenities building may contain PCB oil.

2.7 Post Phase 2 Environmental Site Assessment (URS, 2012e)

URS carried out a data gap review in 2011 which identified a number of areas that required further soil characterisation. URS, 2012e presents the results of an investigation of specific areas of the site based on the data gap study. The scope of the work included drilling of 29 soil bores (SB101 to SB129) to varying depths across the site, gauging and sampling 13 monitoring wells (MW01 to MW13), and analysis of soil and groundwater samples. Fieldwork was conducted in June and July 2012.

Infrastructure remaining on site at the time of fieldwork was similar to that described in URS, 2012b (see Section 2.4).

NDD or a hand auger was used at each test bore location to depths of between 0.9 m to 1.5 m. Test bores were then drilled at some locations using either a push tube or solid stem auger.

Grass, concrete or asphalt was underlain by filling up to a depth of 2.4 m. Natural sandy clay was encountered beneath filling at depths ranging between 0.5 m and 3.0 m and was underlain by shale and siltstone. Hydrocarbon staining and/or odours were encountered at several test bores.

Groundwater was generally encountered within the shale bedrock, although perched groundwater was encountered in filling or at the top of the natural soil in several bores. No phase separated hydrocarbons, odours or staining were encountered in any of the monitoring wells.

A total of 56 primary soils samples and 13 primary groundwater samples were analysed for TPH, BTEX, PAH, lead and phenols. One “fill” sample was also analysed for metals (arsenic, cadmium, chromium, copper, mercury, nickel and zinc), OCP and OPP. Soil Acceptance Criteria were sourced from NEPC, 1999 and NSW EPA, 1994. Groundwater Acceptance Criteria were source from ANZECC and ARMCANZ, 2000.

It is noted by DP that the source of the “fill” sample is not described by URS.

The concentration of TRH C_6-C_9 in the sample from SB116, depth 0.1-0.2 m (180 mg/kg) was above the SAC (65 mg/kg). Concentrations of TRH (C_6-C_9) were within the SAC for all other samples. Concentrations of BTEX were within the SAC for all samples.

Concentrations of TRH C_{10}-C_{36} were in excess of the SAC (1000 mg/kg) in numerous samples including from SB101, depth 0.4 to 0.5 m (2420 mg/kg); SB104, depth 0.2 to 0.3 m (1760 mg/kg); SB116, depth 0.1 to 0.2 m (1180 mg/kg); SB118, depth 0.2 to 0.4 m (1210 mg/kg); SB121, depth 1.0-1.1 m (2990 mg/kg); SB122, depth 0.2 to 0.4 m (3320 mg/kg); SB125, depth 0.5-0.6 m (1490 mg/kg), depth 1.0 to 1.1 m (3800 mg/kg,1860 mg/kg and 3500 mg/kg), and depth 1.9 to 2.0 m (2250 mg/kg). TRH (C_{10}-C_{36}) was also detected in some other samples but at concentrations within the SAC.

The total PAH concentration for the soil sample from SB122, depth 0.2 to 0.4m (25 mg/kg) was above the SAC (20 mg/kg). The concentration for benzo(a)pyrene in this sample (1.8 mg/kg) was also above

the SAC (1 mg/kg). It is, however, noted by DP that the soil investigation levels from NSW EPA, 1994 were adopted by URS instead of those from NEPC, 1999 for commercial and industrial sites. DP consider that NEPC, 1999 criteria (of 100 mg/kg for PAH and 5 mg/kg for benzo(a)pyrene) were the more appropriate criteria given the nature of the land use. The concentrations of PAH and benzo(a)pyrene were within the NEPC, 1999 criteria (for an industrial or commercial land use) for all analysed soil samples.

Phenols were not detected in soil above the LOR. Lead concentrations were within the SAC. Concentrations for metals (in the one analysed sample) were within the SAC. Concentrations of OCP and OPP were below the LOR (for the one analysed sample).

TRH, BTEX, PAH and phenols concentrations were below the LOR in all groundwater monitoring samples. Lead was only detected in one groundwater sample, but at a concentration well within the SAC.

2.8 Groundwater Monitoring Well Decommissioning (URS, 2013a)

URS, 2013a is a letter report confirming that the 13 monitoring wells (MW01 to MW13) had been decommissioned on 3 December 2013.

2.9 Soil Validation (URS, 2013b)

URS was engaged to remove USTs, ASTs and soil contamination as well as conduct soil validation works as part of the on-going site demolition works. Transpacific Industrial Services Pty Ltd were appointed to perform the civil works. Site activities were undertaken in September and October 2012. Infrastructure removal included three 55 000 ASTs and associated pipework, two partial USTs, two interceptor pits and associated pipework.

Prior to dismantling the ASTs, the bituminous material from the ASTs was sampled and subsequently disposed at a licenced waste facility.

Seven excavations (EX01 to EX07) were undertaken as follows:

- EX01: removal of previously identified hotspot of hydrocarbon contaminated soil at north eastern corner of the site. One resultant stockpile (SP01) was disposed off-site. The other resultant stockpile (SP02) was reused onsite.
- EX02: removal of two partial USTs, pipework and hydrocarbon contaminated soil at upper hard stand level. Two resultant stockpiles (SP03 and SP05) were reused on site. The other resultant stockpile (SP04) was disposed off-site.
- EX03: removal of shallow (0.2 to 0.3 m deep) hotspot of impacted soil in north-west corner of site. The resultant stockpile (SP06) was disposed off-site.
- EX04: removal of previously identified impacted soil in the central portion of the former manufacturing area of the site which appeared to correlate to the location of historical service trenches. Three resultant stockpiles (SP11, SP12 and SP13) were disposed off-site. Two resultant stockpiles (SP08 and SP14) were reused on site.

- EX05: removal of interceptor pit and associated contaminated soils located near the ASTs at upper hard stand area. The resultant stockpile (SP07) was reused on site.
- EX06: removal of the interceptor pit and associated contaminated soils at former manufacturing area. The resultant stockpile (SP09) was reused on site.
- EX07: removal of shallow (0.1 to 0.2 m deep) contaminated soil in the area of SB116 at the former manufacturing area. The resultant stockpile (SP10) was reused on site.

The locations of the excavations are shown on Figure 3 from URS, 2013c which is attached. Also attached are Figures 4B to 4E from URS, 2013a which show the sample locations at each excavation.

In addition, a scrape sample from a depth of 0.2 m was collected in the vicinity of MW13 (near north boundary) where a "shallow exceedance was recorded". The soil was not removed from this area.

A total of 87 soil samples collected from excavations and 51 stockpile samples were analysed for TPH, BTEX, lead, PAH and speciated phenols.

Hand auger bores (HA200 to HA202) were completed to the north of the interceptor pit on the eastern boundary which remained *in situ*. Three samples were analysed for TPH, BTEX, lead, PAH and speciated phenols.

Samples were collected of the Imported Virgin Excavated Natural Material (VENM) which was visually assessed on arrival to the site prior to use as filling in excavations. Six samples were analysed for TPH, BTEX, lead, PAH, speciated phenols, metals (antimony, arsenic, barium, cadmium, chromium, cobalt, copper, mercury, molybdenum, nickel, selenium, tin, vanadium and zinc), OCP and OPP.

Analytical results for soil samples were compared to criteria sourced from NEPC, 1999 and NSW EPA, 1994. Stockpiles were classified for off-site disposal using criteria sourced from Department of Environment, Climate Change and Water, *Waste Classification Guidelines, part 1: Classifying Waste,* 2009.

Concentrations of TPH and naphthalene were detected above the SAC in samples collected from EX04 and further chase out (excavation) of this contamination was undertaken. Some TPH C_{10}–C_{36} concentrations were reported above the SAC (1000 mg/kg) at locations EX04_15_1.0 (1190 mg/kg), EX04_28_0.5 (1390 mg/kg) and EX4_47_1.0 (1400 mg/kg). URS considered that further excavation at these sample locations was not required based on statistical analysis.

Apart from the exceedances at EX04 mentioned above, concentrations of contaminants were within the SAC for analysed samples collected from all excavations; hand auger bores (HA200 to HA202); stockpiles SP03, SP05, SP07, SP08, SP09, SP10 and SP14; and imported VENM.

Water ingress occurred at EX04. A total of 26 000 L of water was pumped from EX04 and disposed offsite as (J120) oily waste water. Approximately 511 tonnes of stockpiled soil from the excavations was disposed off-site as general solid waste.

A surface hand pick of asbestos in two locations was undertaken and the clearance certificate, listed below, for the asbestos removal is attached to URS, 2013b:

- Presna, *Clearance Certificate – Asbestos Removal Works at 24 Davis Road, Wetherill Park*, (reference 50578) 10 September 2012.

Loose fragments of asbestos sheeting were noted in the laboratory building in the south west of the site. A licenced contractor carried out works at the laboratory, with dust and debris associated with damaged sheeting removed from the laboratory. The clearance certificate, listed below, was provided and is attached to URS, 2013b:

- Presna, *Clearance Certificate – Asbestos Removal Works at 24 Davis Road, Wetherill Park NSW* (reference 50620), 16 October 2012.

The certificate noted that edges of damaged asbestos-containing fibre cement ceiling panels within the laboratory were encapsulated with yellow paint.

2.10 Environmental Summary Conclusion (URS, 2013c)

It is stated in URS, 2013c that URS did not encounter any soil conditions during remediation that would preclude the continued use of the site for commercial/industrial use.

URS considered that as the 95% Upper Confidence Limit (UCL) of the mean soil concentrations for the contaminants of potential concern were within the (Tier 1) assessment criteria, the risks to human health and the environment were considered to be low and acceptable.

URS considered that as groundwater was not impacted by contaminants of potential concern above the assessment criteria with the exception of metals, risks to human health and the environment were low and acceptable. Due to the widespread nature of the detections it was considered by URS that the detections of heavy metals in the groundwater beneath the site were indicative of local groundwater quality.

3. Site Walkover Observations

Observations made during the site a walkover by an environmental engineer from DP on 14 October 2015 are as follows:

- In-ground recycled water tanks were present at the south of the site near the office building (Photograph 1, attached);
- The workshop, storeroom, laboratory and amenities buildings at the east of the site were present but could not be accessed. A substation was observed between the laboratory and amenities building (Photograph 2, attached). It is understood from conversations with the client that asbestos sheeting remains in the building structure of the laboratory and has been painted to mitigate the potential release of asbestos fibres;
- Concrete stockpile bins were present at the middle level (Bulk Storage Level), but no stockpiles were observed at the site (Photograph 3, attached);

- A remnant shelter was present at the upper level;
- ASTs or signs of existing USTs were not observed during the walkover;
- Batter slopes and retaining walls are present between levels (Photograph 4, attached);
- Much of the site is covered by asphalt although exposed soil was present at parts of the upper level and at the previous main manufacturing area (lower level) presumably associated with remediation works as described in URS, 2013b (Photograph 5, attached);
- A pit cover was observed at the eastern boundary and is presumed to be the cover to the interceptor pit referred to URS, 2013b which had not been removed during remediation works (Photograph 6, attached);
- Grass and trees are present at the peripheries of the site; and
- Surrounding land uses appeared to be primarily industrial with scrap metal operations taking place on the neighbouring property to the west. The neighbouring land to the north was vacant apart from the Sydney Water pipeline.

4. Discussion

From the report review and site walkover, it is noted by DP that:

- URS have conducted detailed soil investigations of the site, particularly given that soil sampling has been conducted from more than 60 test bores and the minimum sampling density is 30 locations for a 2 ha site according to the NSW EPA *Sampling Design Guidelines*, 1995. However, soil sample analysis was generally limited to potential contaminants associated with fuel/chemical storage and asphalt manufacturing and not for other potential contaminants such as pesticides and asbestos.
- Soil beneath the workshop and laboratory buildings has not been investigated. Soil behind the laboratory (where an asphalt stockpile was observed) has not been investigated;
- Soil down-gradient (south) of the existing interceptor pit at the eastern site boundary was not assessed;
- Potential soil contamination from the former substation at the west of the site (next to former main manufacturing area) and the current substation between the buildings at the east of the site have not been investigated (for PCB impacts);
- Hydrocarbon impacted soil (predominantly impacted with TPH C_{10}-C_{36}) remains *in situ* at the former manufacturing area. Although URS concluded that no further excavation (chase-out) of TPH C_{10}-C_{36} impacted soil was required during remediation works and the 95% UCL for contaminants of concern were within the adopted assessment criteria, it is not clearly stated that the contamination identified at test bores SB118, SB121 and SB122 did not need to be addressed further. Also it is unknown if the contamination identified by Dames & Moore (1990) near the workshop is significant;

- Similar to above, it is not clearly stated that the contamination identified at test bore SB104, near excavation EX03, did not need to be further addressed.
- It is unknown if the contamination identified by Dames & Moore (1990) at the previous solvent wash area (at the middle level) is significant. Results for test bore SB22 (URS, 2006) suggest that it is not significant.
- Given that groundwater was monitored from 13 wells spread across the site in three separate events, it is considered that groundwater has been subject to detailed assessment by URS. It is noted that OCP was not tested, although considered to be a potential contaminant of concern in URS, 2004.
- Based on data from all groundwater monitoring events, even though some groundwater impacts were detected, it is considered that significant groundwater contamination was not identified (prior to remediation works). Removal of contaminated soil as a result of remediation works may have resulted in improved groundwater quality across the site.

It is important to note that NSW EPA, 1994 and NEPC, 1999 which were used by URS to source assessment criteria were superseded in April 2014 and May 2013 respectively. The primary guidance for the assessment of contaminated sites is currently:

- National Environmental Protection Council (NEPC), *National Environmental Protection (Assessment of Site Contamination) Measure,* 1999 amended 2013 (NEPC, 2013).

With regard to this change in guidance:

- Soil Health Investigation Levels (HIL) for metals, PAH and phenols for commercial and industrial sites are generally less conservative in NEPC, 2013 than in NEPC, 1999;
- Soil ecological criteria for industrial and commercial sites are presented in NEPC, 2013 for arsenic, copper, chromium, lead, nickel, zinc, DDT, TPH, BTEX, naphthalene and benzo(a)pyrene. It is, however, noted that much of the proposed use of the site will be covered in hardstand and areas of ecological value may be limited to the peripheries of the site (landscape areas);
- The primary health-based Screening Levels (HSLs) for TRH, BTEX and naphthalene in soil are based on the potential risk of exposure via the vapour intrusion pathway; and
- Management limits are presented in NEPC, 2013 for TPH in soil which take into account the nature and properties of petroleum hydrocarbons, such as the formation of observable light non-aqueous phase liquids, fire and explosive hazards and effects on buried infrastructure.

The TPH assessment criteria in NEPC, 2013 are based on TPH fractions that are different to those presented in NSW EPA, 1994.

5. Recommendations

Given that TPH impacted soil is known to exist on site and it is not clear as to whether all TPH impacted soil was addressed by URS (such as that encountered at SB104, SB118, SB121 and SB122) it is recommended that targeted soil sampling be undertaken as a check that petroleum hydrocarbon concentrations are at levels which meet criteria sourced from current guidelines. In addition, limited soil sampling should be undertaken within and around the workshop and laboratory footprints (where possible) as they have not been investigated. At the same time, depending on the soil conditions encountered, selected soil samples should be analysed for other secondary potential contaminants which have not been tested such as OCP and asbestos to check that these are also within the current guideline criteria. In addition, limited soil sampling should be undertaken in areas seen to have ecological value for the future development (i.e. landscape areas).

If the interceptor pit at the eastern part of the site is to be removed for the proposed development then it should be subject to validation testing similar to that undertaken by URS for the removal of other interceptor pits. If the interceptor pit is to remain for the proposed development, soil samples should be collected from the down-gradient side of the pit (if possible) to determine (or otherwise) that it is not a source of contamination.

Given that the site had previously contained numerous potentially contaminating sources, there is a reasonable potential for contamination or buried infrastructure (such as USTs) to exist between sampled/investigated locations. It is recommended that an unexpected finds protocol be established for in-ground works for the proposed development.

6. Conclusion

Overall, the results and findings presented in the reviewed URS reports indicate that the site does not have concentrations of soil and groundwater contaminants which would preclude the use of the site for the proposed Resource Recovery & Recycling Centre development. As guidelines for the assessment of contaminated sites have changed since the URS assessments, some petroleum hydrocarbon impacted soil remains at the site, and some parts of the site have not been subject to intrusive investigations; limited and targeted soil sampling has been recommended to confirm (or otherwise) that the site is suitable for the proposed development.

7. Limitations

Douglas Partners (DP) has prepared this report for this project at 24 Davis Road, Wetherill Park in general accordance with DP's proposal dated 22 September 2015 and acceptance received from Mr Neil Schembri of Bettergrow Pty Ltd. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Bettergrow Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the locations accessible during the site inspection. The advice may also be limited by budget constraints imposed by others or by site accessibility

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Conclusion section of this report, as an extension to the current scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the (environmental / groundwater) components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

Please contact either of the undersigned for clarification of the above as necessary.

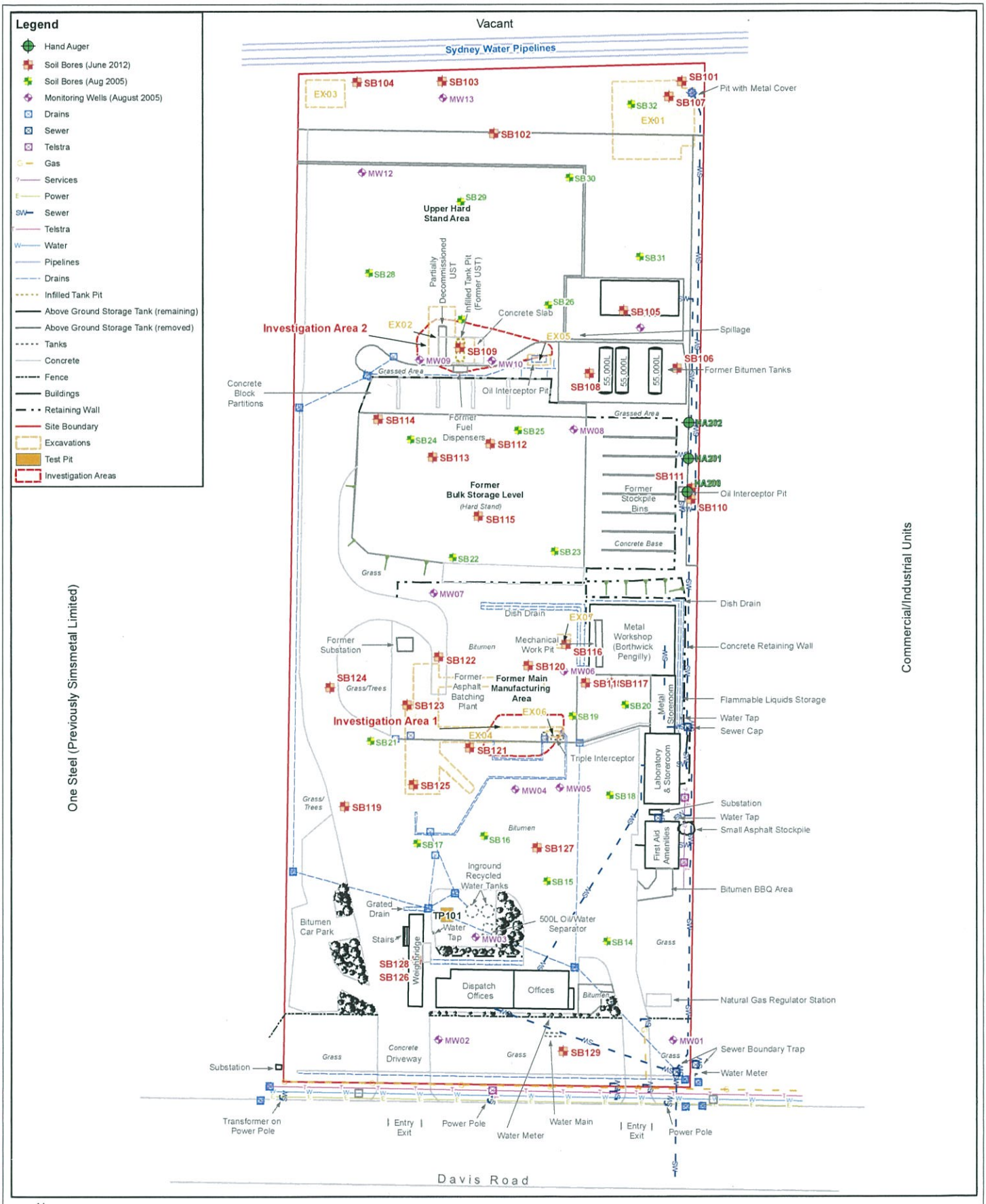
Yours faithfully
Douglas Partners Pty Ltd

David Walker
Environmental Engineer

Reviewed by

Tim Wright
Senior Associate

Attachments: Figure 3 (URS, 2013c)
Dame & Moore sketch
Figures 5A and 5B (URS, 2012b)
Figures 4B to 4E (URS, 2013a)
Site Photographs
About this Report



N
W E
S

0 5 10 20 Metres

Datum: GDA94
Grid: MGA Zone 56

MOBIL OIL AUSTRALIA

WETHERILL PARK ENVIRONMENTAL SUMMARY REPORT, FORMER WETHERILL PARK EMOLEUM DEPOT

INVESTIGATION LOCATIONS

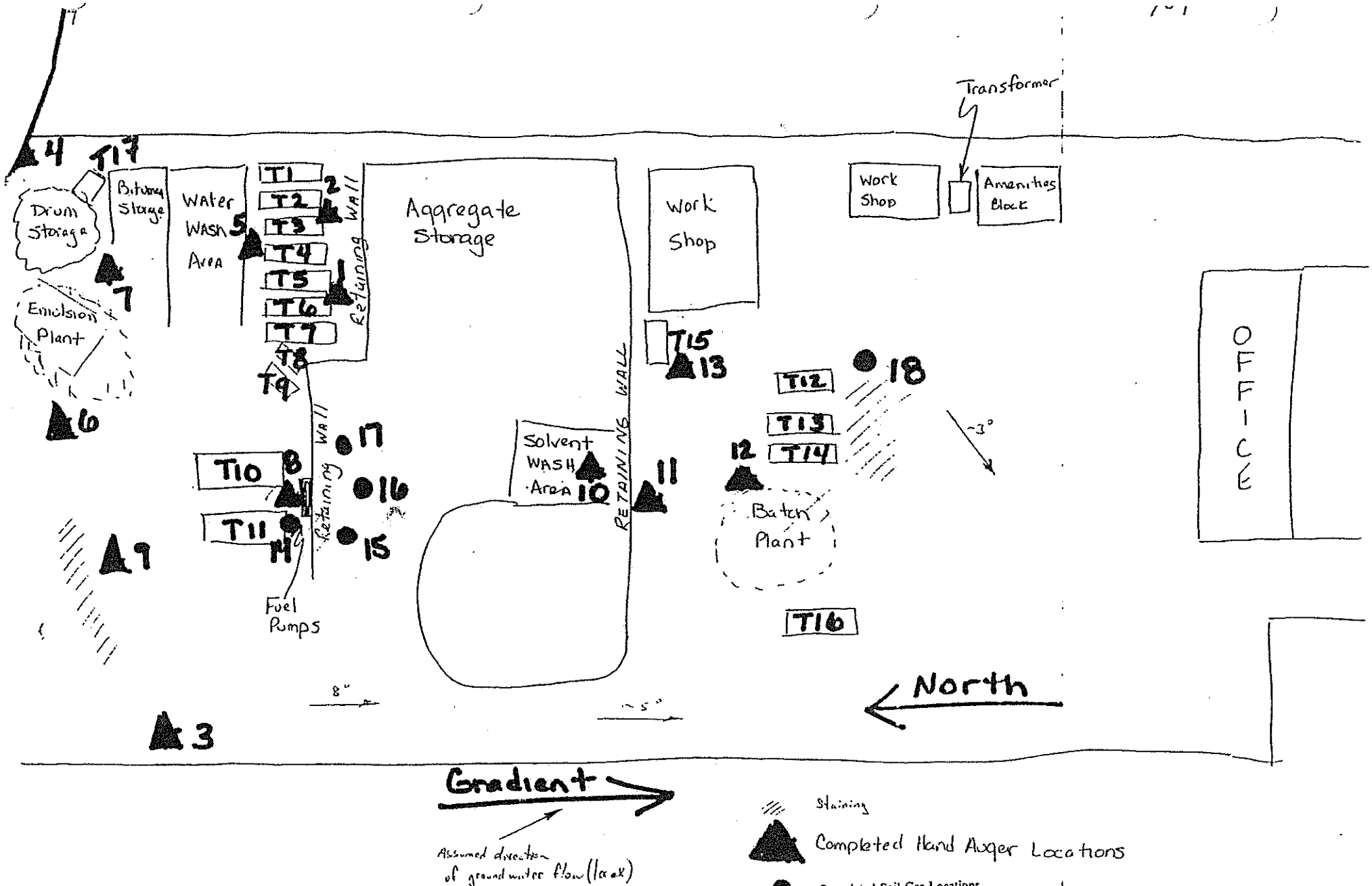
URS

24 DAVIS ROAD, WETHERILL PARK, NSW

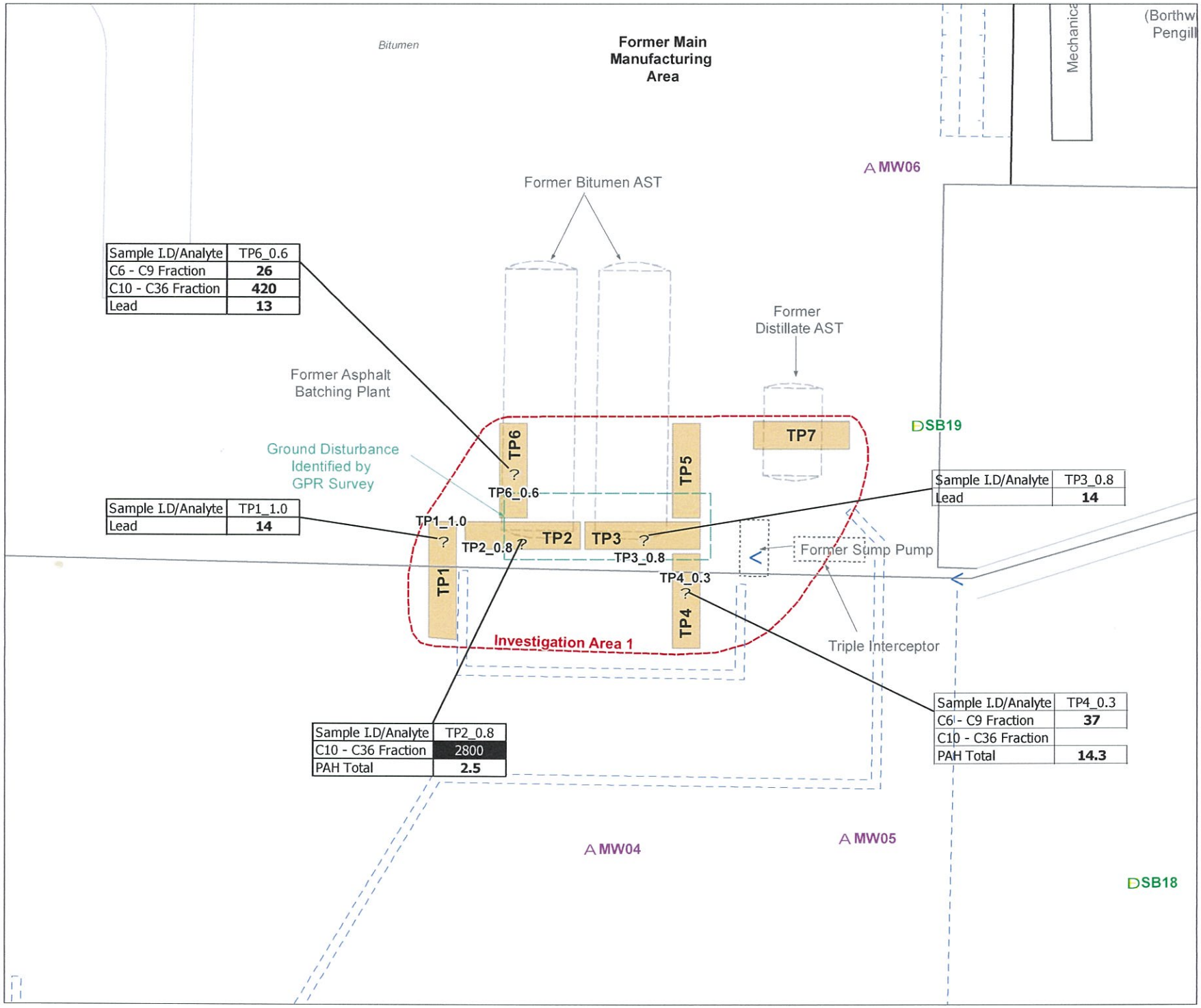
File No: 42424443.022.mxd Drawn: STB Approved: RS Date: 13/02/2013

Figure: 3

Rev. A A3


Transformer
Work Shop
Amenities Block
Drum Storage
Bituminous Storage
Water Wash Area
Aggregate Storage
Work Shop
Emulsion Plant
Retaining Wall
Retaining Wall
Retaining Wall
Solvent Wash Area
Batch Plant
Fuel Pumps
OFFICE
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
T14
T15
T16
T17
North
Gradient
Assumed direction of groundwater flow (local)
Staining
Completed Hand Auger Locations
Completed Soil Gas Locations
T1 Tank Number

DAMES & MOORE



Legend

- Detections
- Soil Bores (Aug 2005)
- Monitoring Wells (August 2005)
- Drains
- Sewer
- Telstra
- Gas
- Sewer
- Drains
- Concrete
- Buildings
- Retaining Wall
- Test Pits
- Investigation Area
- Ground Disturbance Identidifed by GPR Survey

Table Legend

Result >LOR
mg/kg = milligrams per kilogram
SAC = Soil Acceptance Criteria
LOR = Limits of Reporting
Note: Only detections over LOR are shown.

0 1 2 4 Metres

Datum: GDA94
Grid: MGA Zone 56

PATH: T:\JOBS\42424436\WORKSPACES
FILE NO: 42424436.003B
DRAWN: STB APPROVED: MF DATE: 29/06/2012

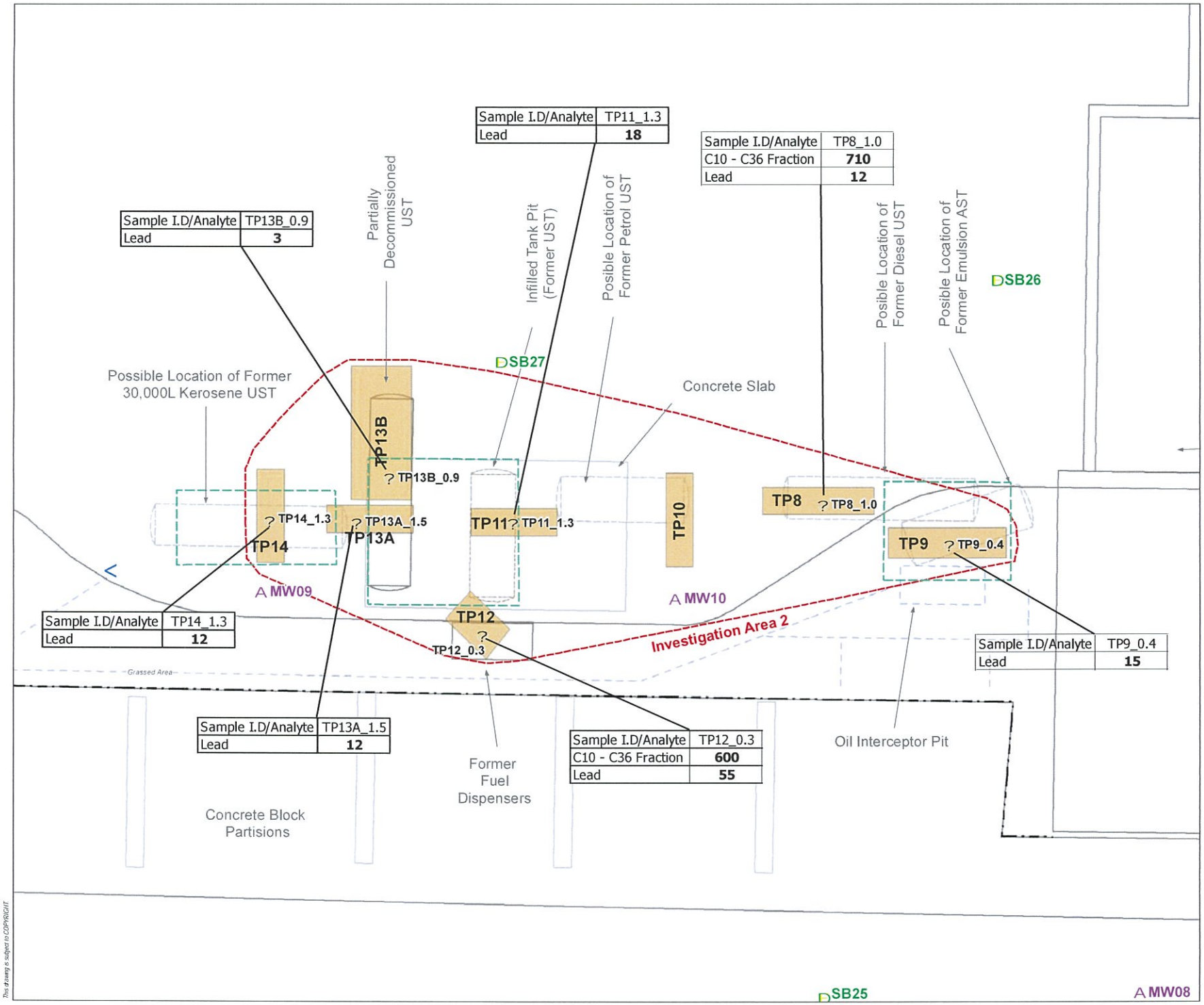
MOBIL OIL AUSTRALIA

WETHERILL PARK TEST PITTING

FORMER WETHERILL PARK
EMOLEUM DEPOT,
24 DAVIS ROAD,
WETHERILL PARK, NSW

INVESTIGATION AREA 1

URS Figure: 5A Rev. A A3



Legend

- ? Detections
- < Drains
- D Soil Bores (Aug 2005)
- A Monitoring Wells (August 2005)
- Infilled Tank Pit
- Drains
- Concrete
- Buildings
- Retaining Wall
- Former Tanks
- Test Pits
- Investigation Areas
- Ground Disturbance Identified by GPR Survey

Table Legend

Result >LOR
mg/kg = milligrams per kilogram
SAC = Soil Acceptance Criteria
LOR = Limits of Reporting
Note: Only detections over LOR are shown.

0 1 2 4 Metres

Datum: GDA94
Grid: MGA Zone 56

PATH: T:\JOBS\42424436\WORKSPACES
FILE NO: 42424436_004B.mxd
DRAWN: STB APPROVED: MF DATE: 29/06/2012

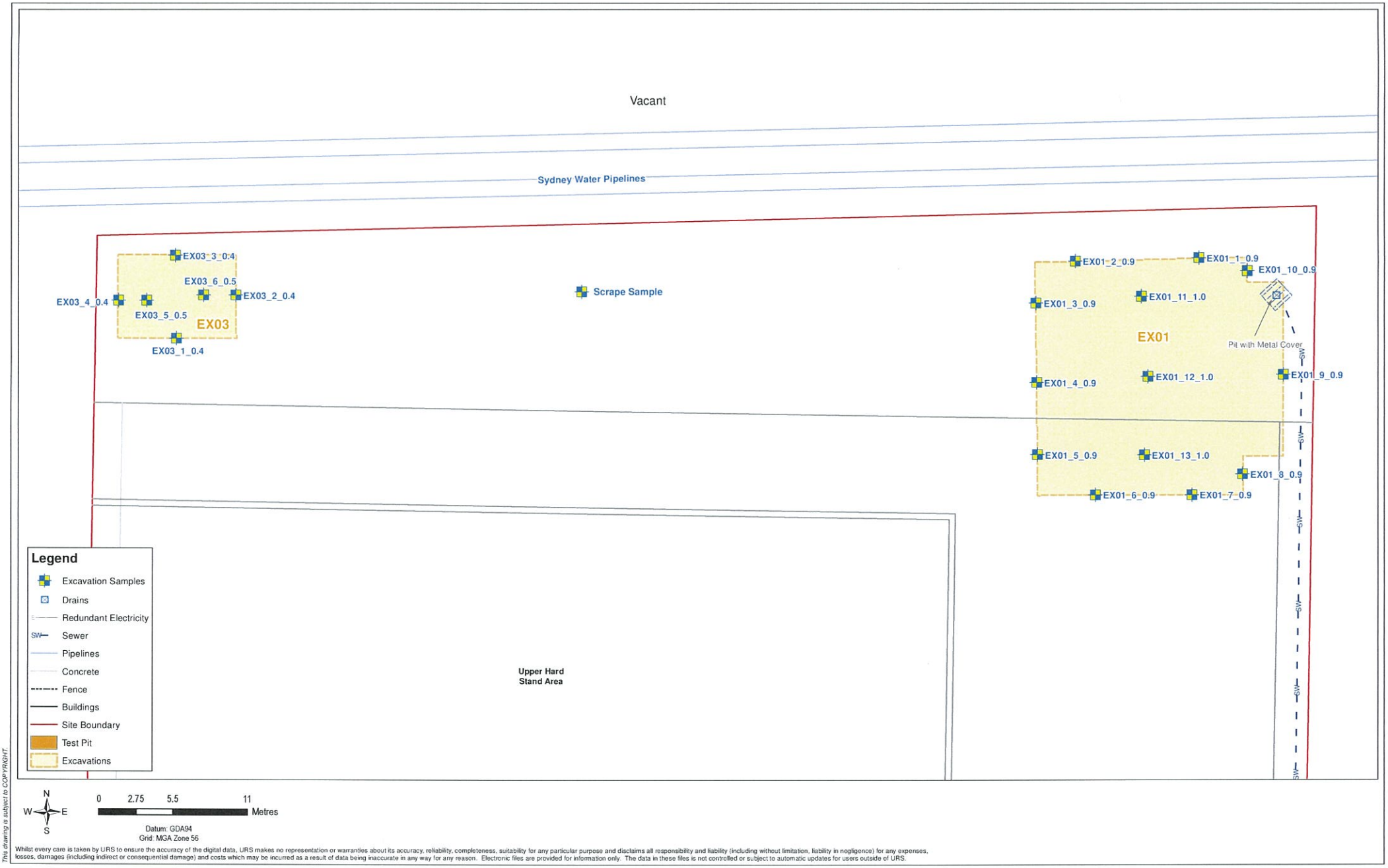
MOBIL OIL AUSTRALIA

WETHERILL PARK TEST PITTING

FORMER WETHERILL PARK
EMOLEUM DEPOT,
24 DAVIS ROAD,
WETHERILL PARK, NSW

INVESTIGATION AREA 2

URS Figure: 5B Rev. A A3



MOBIL OIL AUSTRALIA

WETHERILL PARK SOIL VALIDATION REPORT,
FORMER WETHERILL PARK EMOLEUM DEPOT

EXCAVATIONS 01 & 03
UPPER HARD STAND AREA

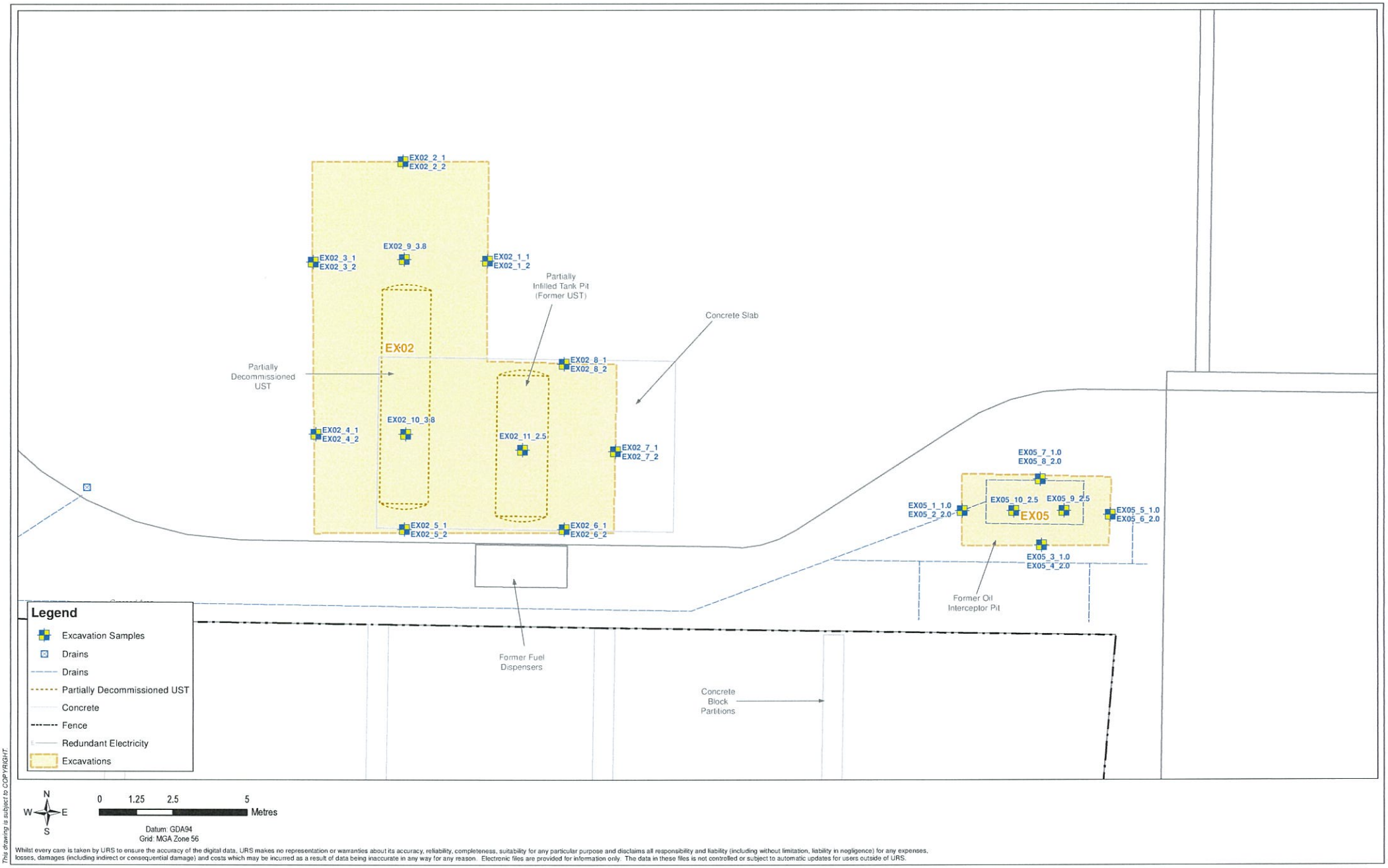
URS

24 DAVIS ROAD, WETHERILL PARK, NSW

File No: 42424443.015b.mxd Drawn: STB/SB Approved: SH Date: 18/04/2013

Figure: **4B**

Rev. A A3



MOBIL OIL AUSTRALIA

WETHERILL PARK SOIL VALIDATION REPORT,
FORMER WETHERILL PARK EMOLEUM DEPOT

EXCAVATIONS 02 & 05
UPPER HARD STAND AREA

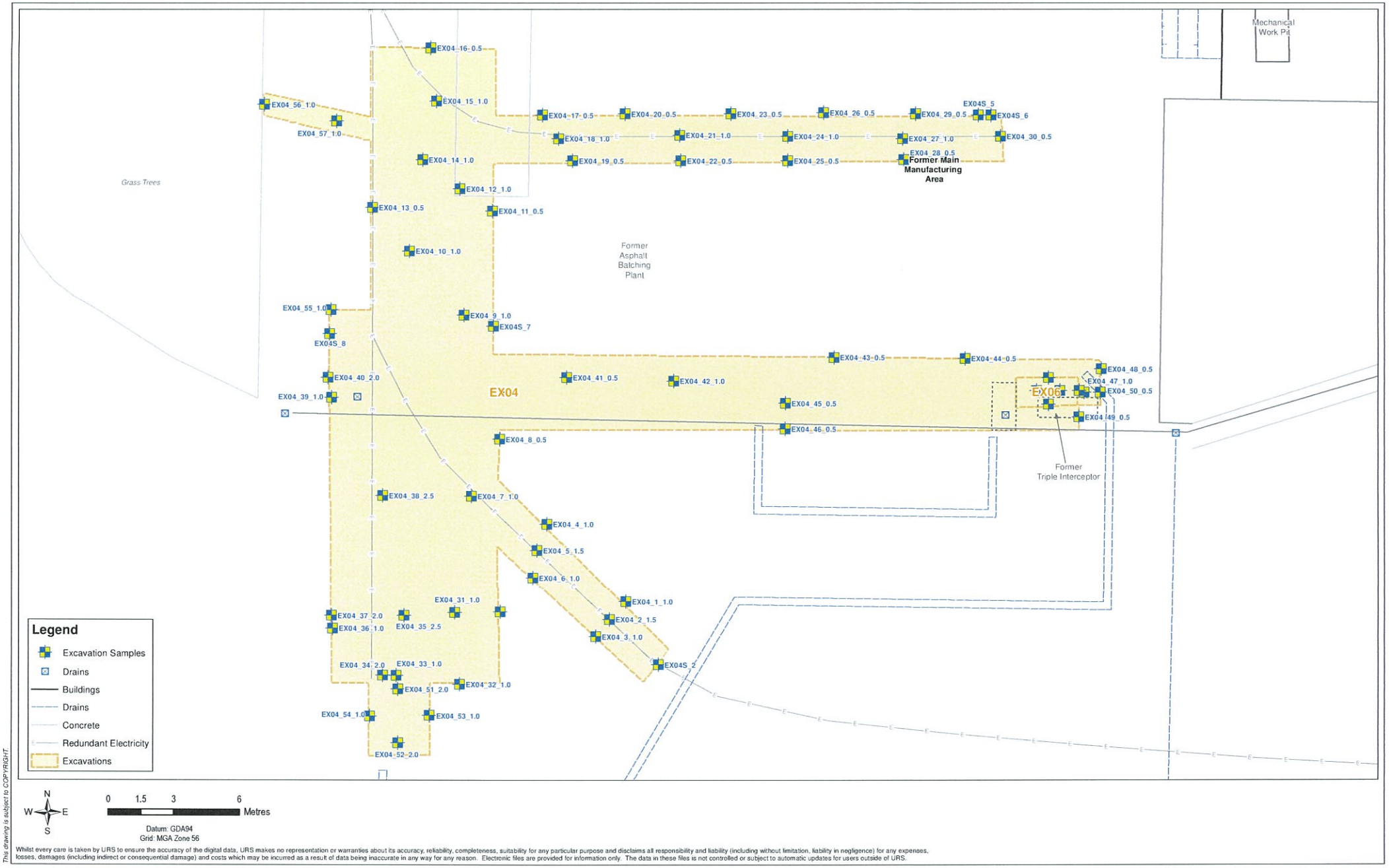
URS

24 DAVIS ROAD, WETHERILL PARK, NSW

File No: 42424443.016_.mxd Drawn: STB/SB/SS Approved: SH Date: 18/04/2013

Figure: 4C

Rev. A A3



Datum: GDA94
Grid: MGA Zone 56

MOBIL OIL AUSTRALIA

WETHERILL PARK SOIL VALIDATION REPORT,
FORMER WETHERILL PARK EMOLEUM DEPOT

EXCAVATIONS 04
FORMER MANUFACTURING AREA

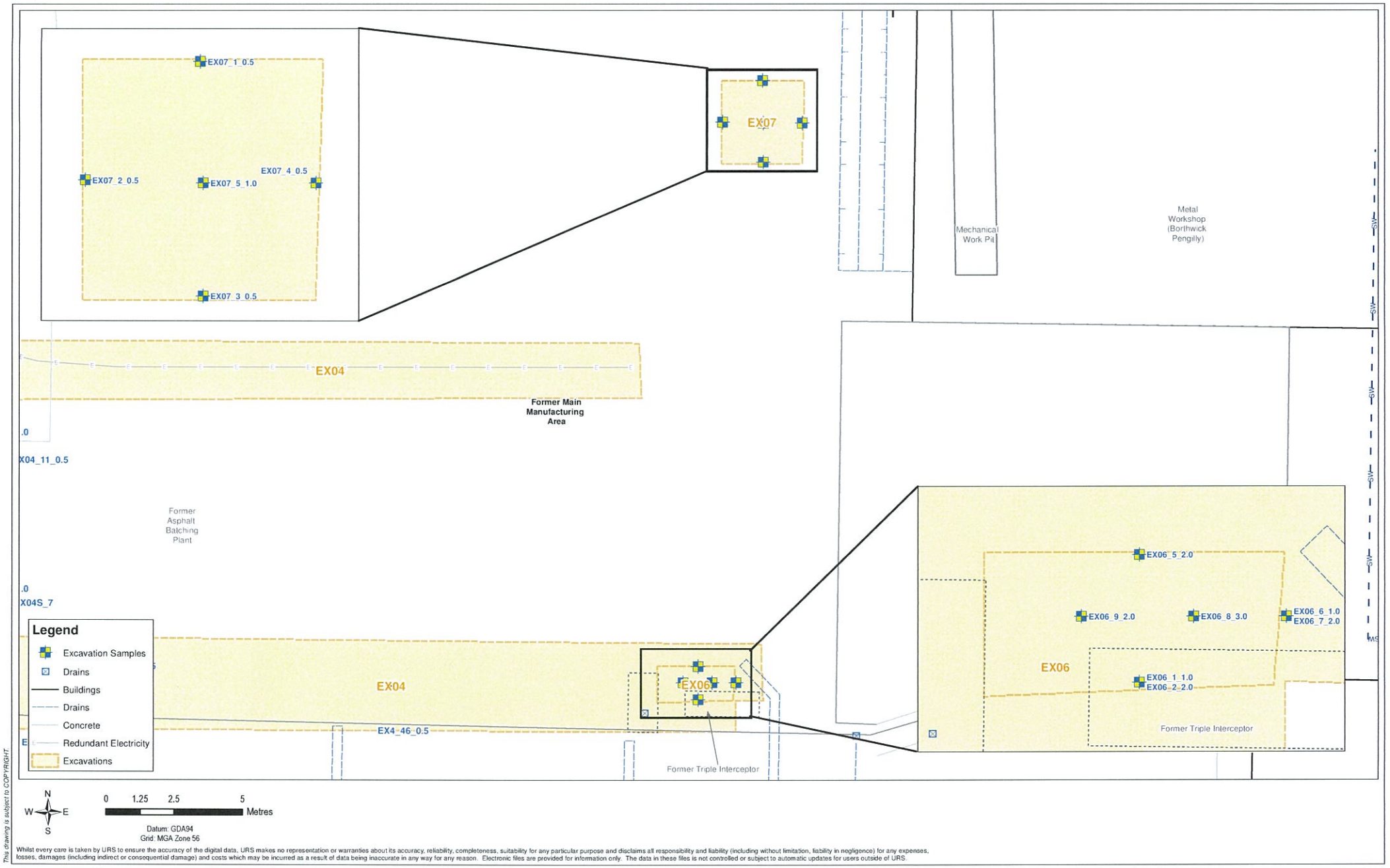
URS

24 DAVIS ROAD, WETHERILL PARK, NSW

File No: 42424443.017.mxd Drawn: STB Approved: SH Date: 18/04/2013

Figure: 4D

Rev. A A3



MOBIL OIL AUSTRALIA

WETHERILL PARK SOIL VALIDATION REPORT,
FORMER WETHERILL PARK EMOLEUM DEPOT

EXCAVATIONS 06 & 07
FORMER MANUFACTURING AREA

URS

24 DAVIS ROAD, WETHERILL PARK, NSW

File No: 42424443.018_.mxd Drawn: STB/SB/SS Approved: SH Date: 18/04/2013

Figure: 4E

Rev. A A3

Photograph 1 - Recycled water tanks

Photograph 2 - Substation

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Proposed Resource Recovery & Recycling Centre** **24 Davis Road, Wetherill Park**	PROJECT: 85126 PLATE No: 1 REV: A
	CLIENT: Bettergrow Pty Ltd	DATE: 15-Oct-15

Photograph 3 - Concrete stockpile bins

Photograph 4 - Batter slope behind workshop

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Proposed Resource Recovery & Recycling Centre** **24 Davis Road, Wetherill Park**	PROJECT: 85126 PLATE No: 2 REV: A
	CLIENT: Bettergrow Pty Ltd	DATE: 15-Oct-15

Photograph 5 - Patches of exposed soil surrounded by asphalt at lower level

Photograph 6 - (Probable) interceptor pit cover

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Proposed Resource Recovery & Recycling Centre** **24 Davis Road, Wetherill Park**	PROJECT: 85126 PLATE No: 3 REV: A
	CLIENT: Bettergrow Pty Ltd	DATE: 15-Oct-15

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.