Draft Detailed Site Investigation

for

Mr. Tony Pincevic

at

Lot 3 DP 215949
1 – 21 Cranebrook Road
CRANEBROOK NSW 2749

By

ESP – ENVIRONMENTAL & SAFETY PROFESSIONALS

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EXECUTIVE SUMMARY

ESP Environmental has been commissioned by Mr. Tony Pincevic (the Client) to prepare a Detailed Site Investigation at Lot 3 DP 215949, 1 – 21 Cranebrook Road, Cranebrook NSW, corner of Cranebrook Road and Londonderry Road (the Site).

This report is in support of an application to redevelop the site for ongoing use as a Service Station. ESP has prepared this report for the site investigations in accordance with current legislation – specifically the *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008.*

ESP – Environmental conducted a limited Phase 2 Site Investigation during August 2009 to determine the extent, or otherwise, of contamination that may have occurred at the Site, as a result of a potentially leaking UST.

The primary Contaminants of Concern (CoC) at Site are identified as the fuel related petroleum hydrocarbons (but not limited to) including:

- Total Petroleum Hydrocarbons (TPH);
- Benzene, Toluene, Ethyl Benzene, Total Xylenes (BTEX); and
- Lead.

The earlier Site Assessment allowed the development of a suitable Remediation Action Plan (RAP) to ensure that the Site was remediated to a standard suitable for continuing and intended land use i.e. Commercial/Industrial.

The overall goal of the RAP was to facilitate the decommissioning requirements in accordance with relevant legislation and guidelines being primarily:

- NSW DECCW 1994 – "Service Station Sites: Assessment and Remediation" and
- Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008.

The decommissioning option (as selected by the Client) was excavation and disposal – receiving development consent from Penrith City Council for DA. No DA09/0731.

A Remediation Action Plan (RAP) was submitted to Penrith City Council (August 2009) for removal and replacement of a UST. These works were intended to be interim only pending full redevelopment of the site. This DSI is in support of that application.

Site investigations indicate that the site have not identified groundwater to the extent of borehole investigations (approximately 8m) and while it is expected that minor localised (near-surface) contamination may exist, the site is considered to require minimal remediation work to remove existing infrastructure and redevelop the site for ongoing use as a Service Station. ESP proposes that additional site assessment in accordance with EPA Guidelines will be undertaken as part of redevelopment works for the site.

In accordance with all relevant DECCW Guidelines, ESP will prepare the following reports as part of site remediation and validation works.

- Preparation of a Site Remediation Action Plan (RAP);
- Preparation of a Sampling Analysis Quality Plan (SAQP);
- Preparation of a Site Validation Plan at the conclusion of any identified additional site remediation works

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Abbreviations

A number of abbreviations have been adopted throughout this report and are detailed below:

- AHD – Above Height Datum
- ANZECC – Australian New Zealand Environment and Conservation Council
- BGL – Below Ground Level
- BTEX – Benzene, Toluene, Ethylbenzene, Xylenes
- B(a)P – Benzo(a)pyrene
- CLM ACT– Contaminated Land Management Act
- DECC – Department of Environment and Climate Change
- DP – Deposited Plan
- NATA - The National Association of Testing Authorities
- NSW DECCW – NSW Department of Environment, Climate Change and Water (includes the NSW Environment Protection Agency – EPA)
- NEPM – National Environment Protection Measure
- NSW – New South Wales
- PAHs – Polycyclic Aromatic Hydrocarbons
- PQL - Practical Quantitation Level
- QA/QC – Quality Assurance/Quality Control
- RPD - Relative Percent Difference
- TPH – Total Petroleum Hydrocarbons
- TRH – Total Recoverable Hydrocarbons
- TWA – Time Weighted Average Exposure Standard
- UPSS – Underground Petroleum Storage Systems
- UPSS Regulation 2008 – Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008
- UST – Underground Storage Tank

1. INTRODUCTION

ESP – Environmental & Safety Professionals was commissioned by Mr. Tony Pincevic (the Client) to prepare this Detailed Site Investigation Report for Lot 3 DP 215949, 1 – 21 Cranebrook Road, Cranebrook NSW, corner of Cranebrook and Londonderry Road (the Site).

This report details laboratory analytical results obtained for the decommissioning of the UST that had ceased to store petroleum hydrocarbon product at Site. . Additional site investigation works will be undertaken in accordance with the RAP to be prepared for the site.

NATA laboratory analysis (attached at Appendix A) to facilitate decommissioning of the UST at site, included the primary petroleum hydrocarbon related Contaminants of Concern (CoC):

- **Total Petroleum Hydrocarbons** (TPH);
- **Benzene, Toluene, Ethyl benzene and Xylenes** (BTEX);
- **Lead** (Pb).

Imported "controlled fill" to site was provided with a certificate from supplier to indicate the suitability for intended purpose i.e. backfill of UST Pit area at Site.

This Detailed Site Investigation Report has been prepared in accordance with:

- *NSW EPA (1994) – "Contaminated Sites Guidelines for Assessing Service Station Sites"*
- *NSW EPA (1997) – "Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites";*
- *NSW EPA (1998) – "Contaminated Sites Guidelines for the NSW Site Auditor Scheme 2nd";*
- *NSW DECC (2008) – "Guidelines for implementing the POEO (Underground Petrol Storage Systems) Regulation 2008"; and*
- *AS 4976-2008 – "The removal and disposal of underground petroleum storage tanks".*

Acceptance criteria for threshold concentrations of selected contaminants relevant to the site have been sourced and are in accordance with:

- *NSW EPA (1994) – "Contaminated Sites Guidelines for Assessing Service Station Sites Threshold Concentrations for Sensitive Land Use";*
- *NSW EPA (1998) – "Contaminated Sites Guidelines for the NSW Site Auditor Scheme 2nd Edition Health Based Investigation Levels Columns 1& 4"; and*
- *NEPM (1999) – "National Environment Protection (Assessment of Site Contamination) Measure Table 5A Columns A &F & Table 5B ".*

The NSW DECCW (1994) Service Station Guidelines provide Health Investigations Levels (HIL's) or threshold concentrations suitable for sensitive land use applications for the identified primary CoC at Site. The NEPM (1999) Assessment of Site Contamination Table 5A Column F provides HIL's for the ongoing Commercial/Industrial use of the site.

DECCW NSW requires that all remediated Service Station sites meet their recommended threshold concentrations. Whilst the NEPM F Guideline Commercial/Industrial threshold concentrations are more lenient, they can only be utilised for comparison purposes. It is worth noting that meeting

sensitive land use HIL's provides a significant buffer before Commercial/Industrial environmental non-compliance becomes an issue. The adopted site remediation criteria selected was that provided by NSW DECCW.

2. SCOPE OF WORK

The Scope of this investigation was to provide undertake a detailed site assessment to determine the current condition of the site and determine what remediation work, if any , was required to ensure the site met all relevant environmental criteria as part of its redevelopment. ESP – Environmental & Safety Professionals hereby provide this Site Assessment in general accordance with Clause 15 of the POEO (UPSS) Regulation 2008.

ESP – Environmentals Scope of Work to provide this DSI included:

- Visual inspections;
- Review historical information to determine whether activities (in addition to the current use as a service station) have the potential to contaminate soil and/or groundwater at the site;
- Review previous reports prepared for the site;
- Review previous site remediation and validation works;
- Propose subsurface investigations to supplement those already undertaken as necessary to confirm the contaminant status of the entire site.
- Propose the collection of soil samples for soil waste classification purposes to facilitate disposal of excavated contaminated UST Pit Backfill;

3. SITE IDETIFICATION

3.1 Site Characterisation

The site is located at 1 – 21 Cranebrook Road, Cranebrook NSW 2749 and is within the Penrith City Council Local Government Area (LGA).

The site is identified by Council records as Lot 3 DP 215 949 and covers an area of approximately 0.4 hectares. The Site is approximately 65 kilometres west of the Sydney Central Business District.

The Site is currently zoned rural lands under the Penrith Local Environment Plan. The Site is located at the corner of Londonderry Road and Cranebrook Road. The Site is located within the greater western Sydney Region, NSW and is an operational Retail Service Station.

The Site is approximately 6km north of Penrith City Centre and surrounded by suburbs including Castlereigh, Llandilo, Londonderry and the suburb formerly known as Mount Pleasant.

For general site location details please refer to Figure 1 – Regional Location Plan.

The surrounding areas of the site consist primarily of rural property as follows:

- To the North is a rural market garden property;
- To the North-East is rural property and remnant bushland;
- To the East is rural property and remnant bushland;
- To South-East is predominantly cleared rural open space;
- To the South is predominantly cleared rural open space;
- To the South-West is rural property; and
- To the west is a rural market garden property.

Sensitive and/or important environments identified at the immediate boundaries of the Site include:

- Market gardens immediately adjacent and on Northern and Western boundaries;
- Market garden in close proximity to the South-West; and
- Remnant bushland immediately adjacent and on Eastern boundary on the other side of Londonderry Road.

The Site is predominantly surrounded by Rural Properties and remnant bushland which may facilitate habitat corridor functionality for fauna. The Site itself does not have any significant bushland.

3.2 Site History

3.2.1 Aerial Photographs

Aerial photographs held at the Department of Lands were not reviewed for this study, but will be interviewed as part of the further characterisation of the site.

3.2.2 Historical Title Search

The historical titles searches for the Site were not reviewed for this investigation, but will be conducted as part of the further investigations for the site.

3.3 Previous Investigations

3.3.1 ESP (2009) Phase 2 Limited Site Investigation, CRANEBROOK SITE, Cranebrook NSW, Final,

The investigation was focused on providing advice on the condition of the Site with respect to contamination of fill and natural soils in the vicinity of the area of the excavated decommissioned UST. Soil samples were collected from this area to an average depth of 5m below ground surface (bgl).

Limited sampling was also conducted at the western and eastern boundaries of the Site to investigate soil conditions and delineate any potential horizontal impacts from the decommissioned leaking UST. In addition samples were collected from the adjacent market garden property to determine the likelihood of the offsite area having been contaminated by a discharge of UST Pit wastewaters from the service station site.

Please refer to **Figure 2** for sampling locations at the site.

The objective of the investigation included determining if any contaminant were present exceeding the regulatory requirements of the NSW DECC Guidelines and other relevant legislation as they pertain to contaminated sites and the decommissioning of UST. Guidelines included but were not limited to:

- Guidelines for Assessing Service Station Sites (NSW EPA, 1994);
- Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulations 2008;
- Guidelines for the NSW Site Auditor Scheme – 2nd Edition (NSW EPA, 2006).

Soil samples collected during the limited Phase II Site Investigation were analysed by a NATA accredited laboratory. Samples were analysed for the following analytes:

- Total Petroleum Hydrocarbons (TPH);
- Benzene, Toluene, Ethyl benzene and Xylenes (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAH's) including B(a)P;
- Lead.

Additional analysis for controlled fill to backfill the UST Pit includes:

- Eight heavy metals arsenic, cadmium, chromium, copper, mercury, nickel, zinc and lead;
- Organochlorine Pesticides (OCP);
- Asbestos;
- Polychlorinated Biphenols (PCB's).

Acceptance or comparison criteria for threshold concentrations of selected contaminants are:

- NSW EPA (1994) – "Contaminated Sites Guidelines for Assessing Service Station Sites Threshold Concentrations for Sensitive Land Use"
- NSW EPA (1998) – "Contaminated Sites Guidelines for the NSW Site Auditor Scheme 2nd Edition Health Based Investigation Levels Columns 1& 4"
- NEPM (1999) – "National Environment Protection (Assessment of Site Contamination) Measure Table 5A Columns A &F & Table 5B "

The NEPM 1999 F Guideline Commercial/Industrial threshold concentrations were selected as being relevant to the current and proposed future land use of the Site. Note, that meeting sensitive land use HIL's as provided by NSW EPA 1994 provides a significant buffer before Commercial/Industrial environmental non-compliance becomes an issue (but may be used for comparison purposes).

SURFACE FILL SOILS

The surface fill material encountered at the Site ranged from 0.3 – 0.4 m bgl. Fill material from the UST excavation area consisted of very loose brown gravely sands which had a slight petroleum hydrocarbon odour. The surface fill material was slightly moist.

PID readings for the surface fill material were in the range of 0.3 – 0.8 ppm. PID readings for the surface fill material at the east and west boundaries were non-detectable.

FILL SOILS

The depth of fill at the UST excavation area was approximately 0.3m – 3.0 m. The Site investigation revealed that the UST Pit backfill soils were predominantly tan-orange grey mottled, silty-clay with variable moisture content ranging from dry to very moist and had consistencies from very soft to very stiff. These clays had a very strong petroleum hydrocarbon odour.

PID readings for the clay fill material were in the range of 20 – 900 ppm.

NATURAL SOILS

The Site investigation revealed that natural soils at the base of UST excavation consisted primarily of silty-clays starting at a depth of approximately 3 m bgl. It appears soils surrounding the UST excavation area are homogeneous silty-clays.

Clays encountered were primarily orange grey mottles and red brown mottles which ranged in consistency from very soft to very stiff to a depth of approximately 5m blg. Red brown mottled clays were also encountered from a depth of approximately 5m blg. Moisture content varied for clays and was in the range of dry to very moist. The total depth of the investigation in the UST excavation area was 7 m blg.

The Site investigation indicates that the soils sampled at the boundary of the Site were not impacted. The total depth of the investigation at the west and east boundaries of the Site was 9 m bgl.

PID readings for silty-clay soils in the UST excavation area were in the range of 0.5 – 140 ppm. PID readings for natural clay soils at the boundaries of the Site were non-detect.

SUMMARY

The Phase 2 identified areas of environmental concern and concluded that:

- Fill soil depths are variable across the Site. Fill ranges from 0.3 m – 0.4 m bgl.
- Impacts of the CoC including TPH and BTEX were detected within the fill and natural surface soils in the vicinity of the area contaminated with UST Pit Wastewaters;
- CoC were detected within the fill and natural base soil materials in the UST excavation area and required remediation;
- Laboratory results indicate 5 sampling locations of BH1, BH2, BH3, BH4 and BH5 in the immediate vicinity of the UST excavation area are impacted to depths of at least 7 m, however have not fully vertically delineated;
- Laboratory results indicate 2 sampling locations (BH6 and BH7) at the eastern and western boundaries of the Site are not impacted with fuel related CoC's;

Results provided by PID on-site assessment of fill and natural soils indicated the UST excavation area is impacted by fuel related CoC, although the exact extent is unknown. However it can be evaluated that the extent of contamination is evident to a depth of 7 m bgl.

The five (5) boreholes at the UST removal area of the Site identified as being impacted by the CoC are BH1, BH2, BH3, BH4 and BH5 (subject to actual NATA laboratory analysis).

Figure 3 illustrates the proposed remediation location.

ESP recommends that the fill and natural clay material impacted by fuel related contaminants requires remediation, as defined by the preparation of a RAP. The proposed site remediation aims to ensure the site remains suitable to operate as a Retail Service Station.

3.3.2 ESP (2009) Validation Report, 1-21 Cranebrook Rd, Cranebrook

ESP Environmental were commissioned by Mr. Tony Pincevic (the Client) to validate the decommissioning of one (1) Underground Storage Tank (UST) at Lot 3 DP 215949, 1 – 21 Cranebrook Road, Cranebrook NSW, corner of Cranebrook Road and Londonderry Road (the Site).

This report is limited to the decommissioning of one (1) only UST at Site, that had ceased to store bulk fuel related petroleum hydrocarbons. ESP prepared this report for decommissioning works at Site, in accordance with current legislation, specifically *Clause 15 of the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008.*

ESP – Environmental conducted a limited Phase 2 Site Investigation during August 2009 to determine the extent, or otherwise, of contamination that may have occurred at the site, as a result of the UST leaking.

The primary Contaminants of Concern (CoC) at site were identified as the fuel related petroleum hydrocarbons (but not limited to):

- Total Petroleum Hydrocarbons (TPH);
- Benzene, Toluene, Ethyl Benzene, Total Xylenes (BTEX); and
- Lead.

The limited Phase II Site Assessment allowed for the development of a suitable Remediation Action Plan (RAP) to ensure that the site was remediated to a standard suitable for continuing and intended land use i.e. Commercial/Industrial.

The overall goal of the RAP was to facilitate the decommissioning requirements in accordance with relevant legislation and guidelines being primarily:

- NSW DECCW 1994 – "Service Station Sites: Assessment and Remediation" and
- Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008.

The decommissioning option selected by the Client was to excavate and dispose of the subject UST and replace it with a new, larger UST. Development consent was received from Penrith City Council (DA. No DA09/0731).

NATA Approved Laboratory analytical results of sampling conducted 24th September 2009 indicate that the UST area at site has been remediated to a standard suitable for continuing Land use i.e. Commercial/Industrial.

Results of sampling of the base and walls of the excavated UST Pit indicate no detections of CoC above site specific adopted remediation criteria's for TPH, BTEX and Lead. The adopted site specific criteria's selected are those presented in the NSW DECCW 1994 – Service Station Sites: Assessment and Remediation Guidelines.

Some CoC impacts were not noted for the areas that were potentially impacted with fuel related petroleum hydrocarbons as a result of the unlawful discharge of UST Pit Wastewaters. i.e. adjacent market gardens. Results were not considered to exceed Regulatory Guidelines, but it was considered prudent to remediate this area when the site is redeveloped, and a full assessment will need to be completed for this area.

4. SITE CONDITION AND SURROUNDING ENVIRONMENT

4.1 Onsite Condition & Environmental Setting

The Site consists of an operational Service Station providing unleaded and diesel vehicle refilling services. In addition, the Site has refreshment facilities and includes a takeaway (and eat in) food services. The site also has a mechanical workshop for motorbikes.

The total Site area covers approximately 0.4 hectares with the main building and fuel dispensing area covering a portion of the Site. The Site consists of primarily hardstand concrete and bitumen covering, with remainder a gravel/topsoil surface fill layer. No surface erosion is evident.

The site surface did not appear to show any signs of soil discolouration. No odours were present for soils in this area during investigations at Site.

4.2 Offsite Condition

Areas beyond the boundary of the site provided no visual indication of any potentially contaminating activities, with only Market Garden activities apparent in the vicinity.

Market Gardens may impact soils (and groundwater) from the use of pesticides and nutrients for fertilization. Investigation into this matter was outside the Scope of Works for the decommissioning of the UST at the Site.

The offsite investigation did not show evidence of hydrocarbon odours present in soils that may have resulted from onsite activities. No staining that may result from hydrocarbon impacts (or otherwise) were noted at this area at Site during investigations.

General vegetation/grass coverings and crops at adjacent Market Garden did not exhibit evidence of plant stress which may result from soil contamination with fuel related petroleum hydrocarbons and/or lead.

4.3 Vegetation

The site's original vegetation has been extensively cleared, however some tree vegetation and grass coverings exist at the northern and eastern boundaries of the site.

The rural (and market garden) properties surrounding the site are both cleared open space and remnant bushland with Australian Native Eucalypts.

Vegetation on the site and in the immediate vicinity do not appear to be showing any signs of visible plant stress.

Vegetables and/or fruit growing in the adjacent market garden did not appear to be showing any signs of visible plant stress.

5. TOPOGRAPHY, GEOLOGY AND HYDROGEOLOGY

The topography of the Cranebrook area consists primarily of low-lying and gently undulating plains and low hills underlain by the Wianamatta group shale and sandstones. The stratigraphic setting places the site on the flanks of the Lapstone Monocline and near north-south trending Kurrajong Fault.

The Site itself, with reference to Sydney 1:250 000 Geological Series Map indicates tertiary period sand, silt , clay and gravels underlain by the Wianamatta group shale and sandstones. The site is generally consistent with these descriptions and is also influenced by fill material.

The Cranebrook area local relief is approximately 30 – 40 m. and the Site elevation approximately 40 m. above sea level. The Site has gentle slopes in a south-westerly and westerly direction towards the Nepean River.

Groundwater was not encountered during intrusive investigations at the Site, with boreholes extended to 9.0m bgl. Therefore it is concluded that groundwater is at a depth in excess of than 9.0 m below ground level.

Groundwater was not encountered in the UST pit excavated in 2009, which was excavated to a maximum depth of 3.5 m. Therefore, at the time of the fieldwork, the groundwater table was inferred to be at a depth greater than 3.5 m below ground level.

The NSW Natural Resource Database identified registered Groundwater Wells at Cranebrook (and surrounding suburbs). The investigation revealed that groundwater wells were deep bores primarily utilised to provide water for irrigation purposes.

The adjacent Market Garden property utilised groundwater for irrigation purposes with bores being in excess of 100 ft. (30m). It is highly unlikely that groundwater at this depth would be contaminated from any potential petroleum hydrocarbon product release from the Site as the area is underlain with Shale and Sandstones, preventing interactions between a relatively shallow unconfined aquifer and the deeper confined aquifers.

6. SAMPLING AND ANALYSIS PLAN AND SAMPLING METHODOLOGY

6.1 Proposed Sampling Pattern

The sample locations will be selected with reference to the *NSW EPA (1994) – "Contaminated Sites Guidelines for Assessing Service Station Sites"* to achieve a representative coverage of the entire site.

Additional sampling will be required to fully assess the entire site, and to classify any excavated contaminated soils for waste classification purposes i.e. intended for disposal offsite. ESP has also previously sampled offsite areas at site and adjacent to the market gardens potentially impacted with CoC as a result of the historic discharge of UST Pit Wastewaters.

With consideration of the above, additional site sampling will be required as part of the site redevelopment works including:

- Any excavated UST Pit Base;
- Any excavated UST Pit Walls;
- All excavated soil stockpiles;
- All workshop areas following building demolition; and
- General site areas in accordance with EPA (1995) Sampling Design Guidelines.

Additional sampling will be required as part of the proposed redevelopment of the site and will need to incorporate both infrastructure to remain on the sire, and that which is proposed to be removed for redevelopment.

The samples will be collected after the UST's (if any) are removed and contaminated soils are excavated and temporary stockpiled prior to disposal offsite at a licensed waste disposal facility.

6.2 Sample Locations

Current sampling is for the area surrounding the replaced UST only. Additional sampling will need to be completed to fully characterise the site as part of proposed redevelopment works, and to comply with sampling requirements as per Sapling Design Guidelines and Service Station Guidelines.

The current sampling pattern satisfied the Validation of Tank Excavation Pit requirements outlined by NSW DECCW 1994 – Service Station Sites: Assessment and Remediation Section 4.2 Validating Tank Excavation Pits. These guidelines specify that to validate a single tank excavation pit, one sample should be collected from the base and also from each wall. This was achieved.

6.3 Potential Contaminants

The assessment focused on petroleum hydrocarbon fuel type contaminants including:

- Total Petroleum Hydrocarbons (TPH);
- Benzene, Toluene, Ethyl Benzene, Xylene (BTEX); and
- Lead.

6.4 Sampling Methods

Sampling of soils was completed in accordance with the principles described in the following guidelines and Australian Standards:

- *NEPM (1999) – "National Environment Protection (Assessment of Site Contamination) Measure" ;*
- *AS 4482.1-2005 – "Guide to the Investigation and sampling of sites with potentially contaminated soil (Part 1:Non-volatile and semi-volatile compounds)";*
- *AS 4482.2-1999 – "Guide to the sampling and investigation of potentially contaminated soil (Part 2: Volatile substances)".*

6.4.1 Sampling Containers

All samples were taken in a manner that ensured that any Volatile Organic Compound (VOC's) losses were minimal. After each sample was taken the bottle or container was immediately sealed with a zero headspace to prevent any VOC losses.

Soils samples were contained in laboratory prepared glass jars with sealable plastic lids. Each soil sample bottle (and lid) was uniquely labelled with:

- Job number
- Sample ID
- Date

6.4.2 Sampling Devices

All samples were taken with a small shovel from areas excavated with an excavator. These samples were immediately placed in appropriate containers and sealed to prevent VOC losses.

6.4.3 Sample Handling Procedures

Soil samples were immediately placed in appropriate glass jar with zero headspace and sealed to prevent VOC losses before the final sample was taken for analysis.

Each sample was uniquely identified with the Job number, Sample ID and Dates recorded on the container label. These uniquely identified samples were recorded on the field sheets and Chain of Custody (CoC) records. Refer to **Appendix B – Chain of Custody's.**

The samples were immediately placed in an insulated esky and placed on ice after collection. The samples were transported to the NATA approved MGT Environmental Laboratory while packed on ice with the relevant Chain of Custody.

Samples were transported to laboratory within required holding times.

6.4.4 Field Duplicates

Validation sampling included additional field duplicates to check for laboratory consistency. The sampling regime included additional 10% duplicate sampling of field samples.

7. FIELD QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

7.1 Sample Collection

ESP representatives attended the site for the purpose of taking environmental samples. ESP staff includes trained scientists and engineers with considerable experience in assessment and remediation of contaminated sites.

7.2 Decontamination

The sampling collection procedure included the decontamination of all sampling equipment between samples. The purpose of decontamination was to prevent cross contamination of samples and included:

- Cleaning all equipment in potable water;
- Cleaning all equipment with Decon 90;
- Final rinse with de-ionised water;
- Use of disposable nitrile gloves;
- Test for cross contamination during storage/transport.

A rinsate sample was obtained indicating that equipment decontamination procedures were sound. Please refer to Sample R (24/09/09 MGT) with no detects of select contaminants of concern.

A blank sample was placed in esky to test potential for cross contamination during storage and transport. Please refer to Sample B (24/09/09 MGT) with no detects of select contaminants of concern.

7.3 Field Duplicates

The field QC included the collection of 10 % duplicate samples during the course of the sampling. To ascertain the reliability of laboratory analysis the Relative Percentage Differences (RPD) was calculated between the replicate and the original sample selected analytes.

A RPD control limit of ±50 % is considered acceptable and for sampling conducted on site to date

8. LABORATORY QA/QC

The laboratory engaged for sample analysis was MGT Environmental which is certified by the National Association of Testing Authorities (NATA) for the selected Contaminants of Concern (CoC) (except asbestos) and is required to conduct in-house QA/QC procedures. The laboratory engaged for asbestos sample analysis was ESP – Environmental which is also certified by NATA.

8.1 Analytical Methods

Suitable analytical methods that are used for analysis of soil and water are presented in Table 1:

Table 1: Method of analysis for selected analytes.

Analytes	Method
Total Petroleum Hydrocarbons	MGT In-house Method 100A
BTEX	USEPA 8260 B, MGT In-house Method 350A
PAH's	USEPA 8270C
Phenolic Compounds	USEPA 8270C Phenols
Metals	USEPA 6010B & 6020 Heavy Metals, USEPA 7470/71 Mercury
PCB's	USEPA 8082 Polychlorinated Byphenols
Asbestos	ESP In-house Method 2
Pesticides	USEPA 8141A Organophosphorus Pesticides USEPA 8081A Organochlorine Pesticides

8.2 Blanks

Laboratory blank samples were analysed for the purpose of identification of unreliable data. The blank results must show concentrations that are below the level of detection which indicates that no cross contamination has occurred at the laboratory.

The results of laboratory blanks are all below the level of detection for soil samples and are considered acceptable. These results are included in the laboratory reports in Appendix A.

8.3 Spike Recovery

Spike recovery tests were conducted by the addition of a known amount of a particular analyte or analytes prior to analysis, and then treating the spiked sample in exactly the same manner as all other samples.

The recovery results indicate the proportion of the known concentrations of the target analytes, which were detected during analysis. Spike recovery results are included in the laboratory report in Appendix A.

Accuracy was assessed by the calculation of the percent recovery (%) and the duplicate sample spikes assess the precision of the methods used.

The results for the percent recovery for TRH and PAH were within the QC acceptance criteria of between 70 – 130 %. Phenols were within the acceptance criteria of between 40 – 150 % recoveries. Metals were also in an acceptable range of between 70 – 130 % recoveries.

The spike recovery results all fell within the acceptable range and the results are considered to be acceptable.

8.4 Laboratory Duplicates

Laboratory Duplicates were analysed to assess the reliability of the results obtained. This included additional analysis of a sample at the laboratory and determining the RPD's.

The laboratory duplicate RPD all fell within an acceptable range. Laboratory duplicate results are available in the laboratory report included in Appendix A.

9. BASIS FOR ASSESSMENT CRITERIA

9.1 Assessment Criteria

Suitable threshold concentrations for selected analytes are in accordance with NSW EPA (1994) – Service Station Guidelines and sensitive land use. The basis for the assessment criteria and threshold concentrations are the most recent available and have been developed using a risk based approach.

The following guidelines have been included for reference purposes:

- *NSW EPA (1994) – "Contaminated Sites Guidelines for Assessing Service Station Sites Threshold Concentrations for Sensitive Land Use"*
- *NSW EPA (1998) – "Contaminated Sites Guidelines for the NSW Site Auditor Scheme 2nd Edition Health Based Investigation Levels Column 4"*
- *NEPM (1999) – "National Environment Protection (Assessment of Site Contamination) Measure Tables 5A & 5B"*
- *ANZECC/NHMRC (1992) – "Guidelines for the Assessment and Management of Contaminated Sites"*

Assessment criteria and source is outlined in Table 2.

Table 2: Soil threshold concentrations (Heath Investigation Level's) for the site.

Analytes	Threshold Concentrations (mg/kg dry wt)	Sources
TPH: C6 – C9	**65**	NSW EPA 1994 Sensitive Land Use
TPH: C10 – C40	**1000**	NSW EPA 1994 Sensitive Land Use
Benzene	**1**	NSW EPA 1994 Sensitive Land Use
Toluene	**1.4[1]/130[2]**	NSW EPA 1994 Sensitive Land Use
Ethyl Benzene	**3.1[1]/50[2]**	NSW EPA 1994 Sensitive Land Use
Total Xylenes	**14[1]/25[2]**	NSW EPA 1994 Sensitive Land Use
Phenol	**8500**	NEPM 1994 HIL Column A – Residential
	42500	NEPM 1994 HIL Column F - Commercial
Total Lead	**300**	NSW EPA 1994 Sensitive Land Use
	1500	NEPM 1994 HIL Column F - Commercial
Benzo(a)pyrene	**1**	NSW EPA 1994 Sensitive Land Use
	5	NEPM 1994 HIL Column F - Commercial
Total PAHs	**20**	NSW EPA 1994 Sensitive Land Use
	100	NEPM 1994 HIL Column F - Commercial
PCB's	**10**	NEPM 1994 HIL Column A – Residential
	50	NEPM 1994 HIL Column F - Commercial

NOTES (1) Adopted from Netherlands maximum permissible concentration for the protection of terrestrial organisms in soil.
(2) Human health based protection level.

9.2 Limitations of Assessment Criteria

Each set of guidelines does not provide a complete set of analytes that are relevant for Service Station Sites. Therefore a number of sources have been referenced for a suitable set of assessment criteria.

The *NSW EPA (1994) – "Contaminated Sites Guidelines for Assessing Service Station Sites Threshold Concentrations for Sensitive Land Use"* utilizes some Dutch guidelines to provide assessment criteria for selected analytes that are not covered by Australian guidelines.

Laboratory analysis gives a Total Recoverable Hydrocarbons (TRH) result as compared to Total Petroleum Hydrocarbons (TPH). TRH analysis includes TPH and is a sample that is not treated by silica gel clean up at the laboratory. Therefore if TRH is within the acceptance criteria so will TPH.

10. RESULTS

10.1 Field Observations

10.1.1 Subsurface Conditions

The following soil profile was encountered at the UST pit area:

- Gravel/sand topsoil layer;
- Pit backfill sands; and
- Natural mottled clays ranging in colours varying from red, orange and browns to greys

The UST Pit areas had a petroleum hydrocarbon odour, consistent with service station sites.

10.1.2 Potential for Contamination

The potential for soil contamination is apparent due to:

- An imported fill layer from unknown sources at the surface of UST pits;
- Tankpit backfill sands;
- UST's storing bulk petroleum hydrocarbon product; and
- The presence of petroleum hydrocarbon odours.

The UST pit soil material (base and walls) was predominately impervious clay - limiting the spread of any contamination to other parts of the site and potentially groundwaters.

10.1.3 Hydrogeology

Groundwater was not encountered in the UST pits during the soil sampling and analysis regime.

10.1.4 Tank Specifications

The new UST installed at the site is double walled and designed and manufactured in accordance with relevant industry standards.

Please refer to Appendix C – Tank Information for specifications.

10.2 Analytical Results

A total of five (5) soil samples were taken on 24th September 2009 from the UST pit base and walls following remedial works. A duplicate was also obtained.

Two (2) samples were obtained from the excavated material. One (1) sample was obtained from the area at site potentially impacted by the discharge of wastewaters. One (1) sample was obtained from market garden soils that were growing vegetables intended for human consumption.

In addition, six (6) further samples, from the excavated material, were obtained on 21st December 2009.

Results are presented in Tables 3 and 4.

Table 3: Summary of laboratory results for soil sampling 24th September 2009. All results in mg/kg.

Sample ID	THRESHOLD CONCENTRATIONS		1	2	3	4	5	6	8	10	12
Material			Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date of Sampling			24/09/09	24/09/09	24/09/09	24/09/09	24/09/09	24/09/09	24/09/09	24/09/09	24/09/09
Depth (m)			2.0	2.0	2.0	2.0	3.5	0.15	0.15	0.15	0.15
HEAVY METALS											
Lead	300[1]	1500[2]	5.0	13	8.5	8.9	6.9	16	20	32	17
TOTAL RECOVERABLE HYDROCARBONS											
C6 - C9 Fraction	65[1]		< 20	< 20	< 20	< 20	< 20	< 20	21	< 20	< 20
C10 - C14 Fraction			< 50	< 50	< 50	< 50	< 50	< 50	290	< 50	< 50
C15 - C28 Fraction			< 100	< 100	< 100	< 100	< 100	< 100	<100	< 100	< 100
C29 - C36 Fraction			< 100	< 100	< 100	< 100	< 100	< 100	<100	< 100	< 100
Total C10 - C36	1000[1]		<250	<250	<250	<250	<250	<250	<250	<250	<250
BTEX											
Benzene	1[1]		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.05	< 0.05
Toluene	1.4[1]	130[1]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.05	< 0.05
Ethylbenzene	3.1[1]	50[1]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.09	< 0.05	< 0.05
Total Xylene	14[1]	25[1]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.62	< 0.05	< 0.05
POLYCYCLIC AROMATIC HYDROCARBONS											
Benzo(a)pyrene	1[1]	5[2]	-	-	-	-	-	<0.1	<0.1	-	-
Total PAH	20[1]	100[2]	-	-	-	-	-	<0.1	0.8	-	-
PHENOL	8500[3]	42500[2]	-	-	-	-	-	<0.2	<0.2	-	-

NOTES (1) NSW EPA 1994 Sensitive Land Use
(2) NEPM 1999 HIL Column F – Commercial & NSW Site Auditor Scheme 1999 HIL Column 4
(3) NEPM 1999 HIL Column A – Residential & NSW Site Auditor Scheme 1999 HIL Column 1
BOLD Denotes that the result exceeds threshold concentrations
ND Not Detected
- Not Analysed

Table 4: Summary of laboratory results for soil sampling 21st December 2009. All results in mg/kg.

Sample ID	THRESHOLD CONCENTRATIONS		1	2	3	4	5	6
Material			Soil	Soil	Soil	Soil	Soil	Soil
Date of Sampling			21/12/09	21/12/09	21/12/09	21/12/09	21/12/09	21/12/09
Depth (m)			0.2	0.2	0.2	0.2	0.2	0.2
HEAVY METALS								
Lead	300[1]	1500[2]	11	11	16	11	18	14
TOTAL RECOVERABLE HYDROCARBONS								
C6 - C9 Fraction	65[1]		< 20	< 20	< 20	< 20	< 20	< 20
C10 - C14 Fraction			< 50	< 50	< 50	< 50	< 50	< 50
C15 - C28 Fraction			< 100	< 100	< 100	< 100	220	< 100
C29 - C36 Fraction			< 100	< 100	< 100	< 100	< 100	< 100
Total C10 - C36	1000[1]		<250	<250	<250	<250	<250	<250
BTEX								
Benzene	1[1]		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	1.4[1]	130[1]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	3.1[1]	50[1]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Xylene	14[1]	25[1]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
POLYCYCLIC AROMATIC HYDROCARBONS								
Benzo(a)pyrene	1[1]	5[2]	<0.1	-	-	-	-	-
Total PAH	20[1]	100[2]	<0.1	-	-	-	-	-
PHENOL	8500[3]	42500[2]	<0.2	-	-	-	-	-

NOTES (1) NSW EPA 1994 Sensitive Land Use
(2) NEPM 1999 HIL Column F – Commercial & NSW Site Auditor Scheme 1999 HIL Column 4
(3) NEPM 1999 HIL Column A – Residential & NSW Site Auditor Scheme 1999 HIL Column 1
BOLD Denotes that the result exceeds threshold concentrations
ND Not Detected
- Not Analysed

Total Recoverable Hydrocarbons

Samples were within adopted site criteria for Total Recoverable Hydrocarbons.

Benzene, Toluene, Ethyl benzene, Xylenes (BTEX)

Samples were within adopted site criteria for BTEX.

Lead

Samples were within adopted site criteria for Lead.

Polycyclic Aromatic Hydrocarbons (PAH)

Three samples obtained from excavated waste were tested for PAH.

Samples were within adopted site criteria for PAH including benzo(a)pyrene.

Asbestos

Additionally, excavated waste was tested for asbestos.

No detections were indicated by laboratory analysis.

Imported Backfill

Please refer to Appendix D – Imported Fill Certificate which indicates the suitability of UST backfill material.

11. CONCLUSIONS AND RECOMMENDATIONS

ESP – Environmental concludes that environmental investigations completed at the site to date meet relevant Regulatory Guidelines, but acknowledges that additional investigative work is required to assess the condition of the remainder of the site to comply with these Guidelines. Additional environmental work is proposed to be completed in conjunction with any other DA Conditions applicable to the site and in accordance with NSW EPA (1994) Service Station Guidelines.

Final testing of excavated soil material which was retained at the site does not indicate exceedances to adopted site criteria for the current landuse, and is considered suitable for reuse. Excavated soil material was not disposed offsite by the owner/occupier.

ESP – Environmental further notes that the intended future use of the site is for Commercial/Industrial use as a Service Station.

As part of the redevelopment of the site, the following may be required to meet Regulatory Guidelines:-

- A Sampling and Analysis Quality Plan (SAQP) for proposed additional site sampling;
- A Remedial Action Plan for proposed additional remediation works which may be required for the site;
- A Validation report to confirm the entire site meets Regulatory criteria;
- An EPP in accordance with UPSS Regulations

ESP notes that additional site investigations are required to comply with EPA Sampling Design Guidelines and EPA Service Station Guidelines. ESP further notes that plans for the proposed redevelopment have not yet been made available for review.

12. LIMITATIONS

This report and associated documentation and the information herein have been prepared solely for the use of Mr Tony Pincevic, the owner/occupier of the site, and any reliance assumed by other parties on this report shall be at such party's own risk.

Any ensuing liability resulting from use of the report by third parties cannot be transferred to ESP – Environmental.

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.

This Validation Report is based upon limited sampling required to validate the decommissioning of one (1) formerly used UST at Site.

In addition the site characteristics may change at any time in response to variations in natural conditions, chemical reactions and other events including groundwater movement, contamination migration in soils, surface water infiltration, leaks from other USTs etc. These changes may occur after ESP – Environmental investigations, assessment and remedial works.

Therefore ESP can not provide unqualified warranties nor does ESP assume any liability for site conditions not observed or identified.

Regulatory or guideline criteria for the evaluation of environmental soil and groundwater quality are frequently being reviewed and concentrations of contaminants which are considered acceptable in the present may in the future be considered unacceptable.

The information contained in this report is considered to be accurate on the date of issue in accordance with the conditions of the site at the time of inspection only.

This report shall only be presented in full, except where written approval with comments is provided by ESP – Environet.

ESP – Environmental

13. FIGURE 1 – REGIONAL LOCATION PLAN

esp Environmental & Safety Professionals

TITLE: Figure 1 - Regional Location Plan

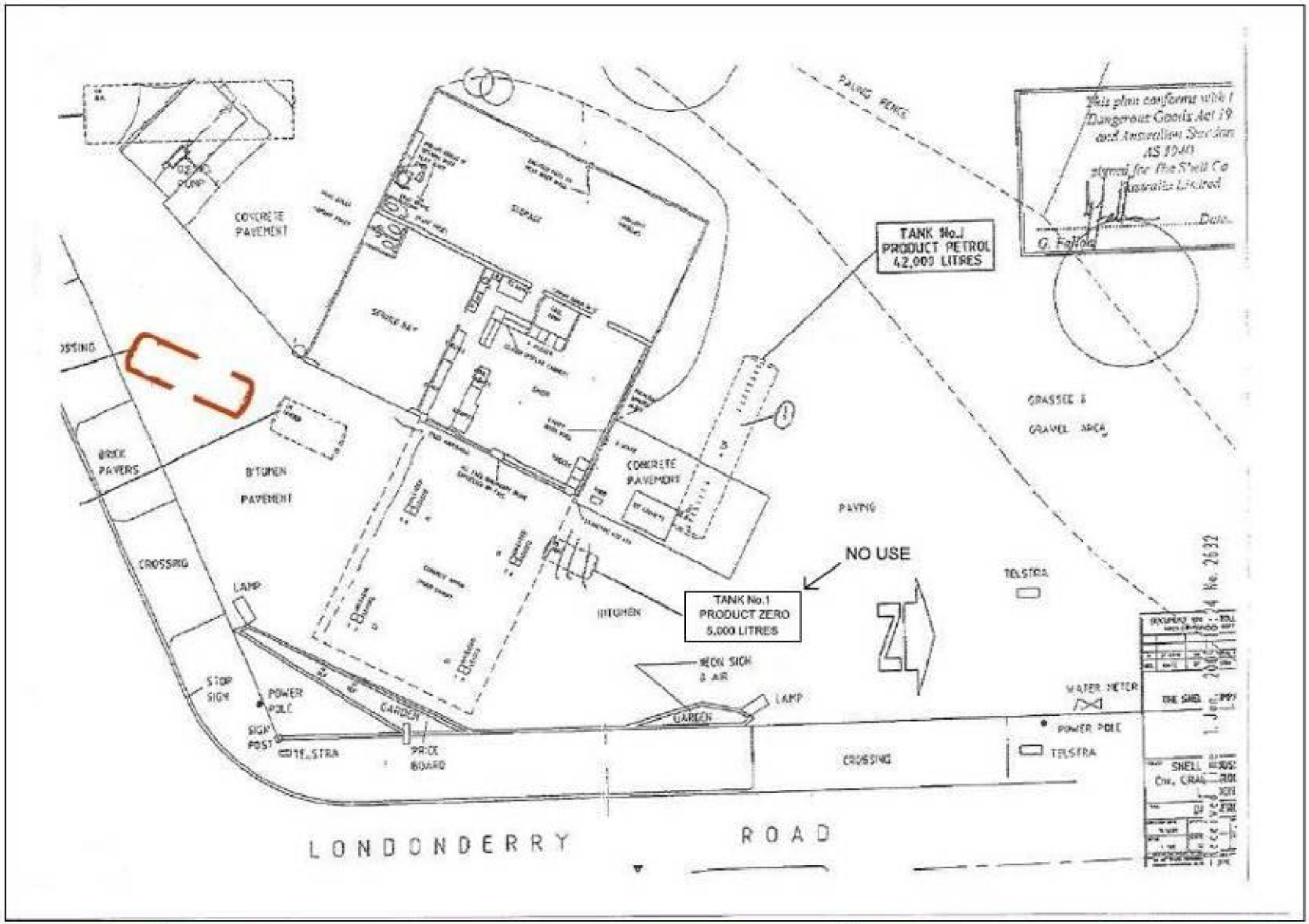
SITE: Lot 3 DP 215949, 1-21 Cranebrook Road, CRANEBROOK NSW 2749

[redacted]

LEGEND: Site Location - Service Station

REF:	JOB NO:	DATE:
Service Station Developments	14069	27/07/2009

14. FIGURE 2 – SITE PLAN



esp Environmental & Safety Professionals	TITLE: Figure 2 - Site Plan	LEGEND: Removed Underground Storage Tank Location		
	SITE: Lot 3 DP 215949, 1-21 Cranebrook Road, CRANEBROOK NSW 2749			
	[redacted]	REF: Service Station Developments	JOB NO: 14069	DATE: Oct 2009

15. APPENDIX A – LAB RESULTS

16. APPENDIX B – CHAIN OF CUSTODY

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Page 1 of 1

Company Name : ESP ENVIRONMENTAL	Contact Name : AARON WALKER	Purchase Order :	COC Number :
Office Address :	Project Manager :	PROJECT Number : 14069	mgt QUOTE ID :
Lot 14 NEW CANTERBURY RD HURLSTONE PARK NSW 2193.	[redacted]	Courier Consignment # :	

Special Directions & Comments :

Laboratory Address: mgt Environmental Consulting Pty Ltd
3 Kingston Town Close Oakleigh - Australia.
[redacted]

	Sample ID	Date	Matrix	TPH	BTEX	LEAD	EPA 448 Suite	Container 1LP	250P	125P	1LA	VIAL	100mL A	OTHER
1	1	24.09.09	SOIL	✓	✓	✓								
2	2	"	"	✓	✓	✓								
3	3	"	"	✓	✓	✓								
4	4	"	"	✓	✓	✓								
5	5	"	"	✓	✓	✓								
6	6	"	"				✓							
7	8	"	"				✓							
8	10	"	"	✓	✓	✓								
9	12	"	"	✓	✓	✓								
10	BR. 24.09.09	"	"	✓	✓	✓								
11	B	"	WATER	✓										
12	R	"	"	✓										
13														
14														

[redacted]

Lab Notes :

Turn around Time : 24 Hrs 48 Hrs (5 Days) 10 Days

Comments

Method Of Shipment
☒ Courier
☐ Hand Delivered
☐ Postal

NOTES :

mgt Environmental Consulting Pty. Ltd.

3 Kingston Town Close, Oakleigh, Victoria 3166, Australia
Postal Address: P.O. Box 276, Oakleigh, Victoria, 3166, Australia
Telephone: + 61 3 9564 7055
Fax+ 61 3 9564 7190
Email: mgt@mgtenv.com.au

Page 1 of 1

CHAIN OF CUSTODY RECORD

Company Name: ESP ENVIRONMENTAL
Postal Address: 604A NEW CANTERBURY RD HURLSTONE PARK NSW
Phone: PH [redacted]

Order No.:
Project: 14069
Job No.: [redacted]

Special Directions & Comments:

Sample ID	Date	Comments	TPH	BTEX	LEAD	EPA 448	Container: Jar	Vial	Other	500 ml	1000 ml	2500ml	OTHER
1	4.12.21	SOIL				✓							
2	"	"	✓	✓	✓								
3	"	"	✓	✓	✓								
4	"	"	✓	✓	✓								
5	"	"	✓	✓	✓								
6	"	"	✓	✓	✓								

Secondary Lab Address
Name:
Address:
ALL SAMPLES MUST BE TRANSFERRED TO THE LABORATORY ON ICE

[redacted]

Turn around Time: 24 Hrs 48 Hrs 72 Hrs (5 Days)
Comments:

Method Of Shipment: Courier / X Hand Delivered / Postal

FORM 29 – SAMPLE RECEIPT CUSTODY FORM

Client
~~Company~~ Name: Tony PINCEVIC

Postal Address: 1-21 CRANEBROOK RD

[redacted]

Order No:

Project: 14069

Job No:

[redacted]

ESP – Environmental and Safety Professionals
A division of Enviro-Net Australia Pty. Ltd.
ABN 39 067 499 389 ACN 067 499 389 NATA Reg. 3110
2B /2 Parker Street, Footscray, Victoria 3011
[redacted]

Special Directions & Comments:

.....

.....

.....

.....

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Secondary Laboratory Details:

.....

.....

.....

.....

.....

.....

Sample ID	Date	Asbestos Bulk ID	Asbestos Fibre Counting	Asbestos Soil	Synthetic Mineral Fibre – Non NATA	Lead	Other / Specify	Comments
A1	21.12.09			✓				
A2	"			✓				
A3	"			✓				

[redacted]

Turn-around time

24hr	48Hrs	72Hrs	5 Days
☐	☐	☒	☐

Method of Shipment

Courier	☐
Post	☒
Hand	☐

[redacted]

Survey Address: 1-21 CRANEBROOK RD, CRANEBROOK NSW

ESP Job No: 14069

Survey Date: 21.12.09

SUMMARY OF RESULTS

Building:

Surveyed by: ESP - Environmental & Safety Professionals

Name of Auditor: AW.

ESP Sample No	Location / Room	Surface Description	Material Description	Asbestos Detected	Friable	Bonded	Condition	Risk Potential Priority	Comments	Qty (M2)
A1	SOUTH SIDE	~~SOIL~~	SOIL							
A2	WEST SIDE		SOIL							
A3	EAST SIDE		SOIL.							

Priority 1 – High Risk Potential: Asbestos containing materials are in a damaged / poor condition or friable and exposed state, such that asbestos fibres are being or are likely to be released to atmosphere. Potential health risk. The immediate removal of this asbestos containing material is recommended.

Priority 2 – Minor risk potential: Asbestos containing materials are identified, whilst not seen at present as a substantial risk. Materials are located in areas that are subject to potential deterioration or disturbance and possible future risk. Appropriate abatement measures should be taken as soon as possible. Until then, effective use of an asbestos management plan is seen as necessary.

Priority 3 – Minimal risk potential: Asbestos containing materials are stable and effectively sealed against fibre dispersion to atmosphere. Health risk is negligible if left undisturbed and under the control of an asbestos management plan.

Priority 4 – Areas inaccessible at time of survey "deem that asbestos is present"

Friable asbestos material means any material that contains asbestos and is in the form of a powder or can be crumbled, pulverised or reduced to powder by hand pressure when dry.

Bonded asbestos material means any material (other than friable asbestos material) that contains asbestos.

17 APPENDIX C – BORELOG DATA

18. APPENDIX D – NEW UST INFORMATION

FTS

Form : F 480
Revision: A

AIR TEST CERTIFICATE - FRP TANKS

TANK DESCRIPTION: DW, SC, T56

TANK NUMBER: 2687

TEST DATE: 1.4.09

	CRITERIA	RESULTS	
STRUCTURAL TEST Lifting Lugs	Lifted for 1 minute when full	PASS	FAIL
VACUUM TEST	10.5" of Mercury	PASS	FAIL
PRESSURE TEST Outer Tank	35KPa	PASS	FAIL
Inner Tank	35KPa	PASS	FAIL
Fittings and Manway	35KPa	PASS	FAIL
TANK TEST RESULTS		PASS	FAIL

Tested in accordance with Xerxes procedures and UL1316.

FIBRETANK TESTER: Bob Todorowski

FIBRETANK SUPERVISOR: Scott Clarke [redacted]

Fibretank Systems Pty Ltd
ABN: 95 095 717 525
PO Box 102 Carrington NSW 2294
52 Parker Street Carrington NSW 2294 Australia

Ph: + 61 2 4961 2745
Fax: + 61 2 4962 2812
www.ftstanks.com

fts Tanks
For A Changing World

Single & Double Wall

Specification and Performance Warranty F 900 REV B

Fibreglass Tanks

Guide Specifications For Single and Double Wall Fibreglass Reinforced Plastic (FRP) Underground Storage Tanks.

SHORT FORM: FTS will provide Single or Double Wall Fibreglass Reinforced Plastic (FRP) Underground Storage Tanks as shown on the drawings. Sizes and fittings shall be as shown. The tanks will be fibreglass tanks as manufactured by FTS, under licence to Xerxes Corporation of USA. Tanks will be tested and installed with crushed stone or pea gravel as specified in the current installation instructions provided with the tank.

LONG FORM:

1.0 General

1.1 Quality Assurance

A. Acceptable Manufacturer: FTS

B. Governing Standards as applicable:
1. AS1692 CAT.4 TANKS
2. Underwriters Laboratories Inc. (UL) Standard for safety 1316. File MH 9061 (N) for storage of flammable liquids.

1.2 Submittals

A. Shop Drawings: FTS will submit a general arrangement drawing for each tank. Drawings will show locations of all fittings, accessories and critical dimensions.

B. Catalogue Data: Installer will submit one copy of manufacturer's literature to include one copy of manufacturer's current installation instruction.

2.0 Products

2.1 Single and Double Wall Fibreglass Reinforced Plastic (FRP) Underground Storage Tanks

Note that Double Wall tanks will have space between the primary and secondary shell walls to allow for the free flow and containment of all leaked product from the primary tank. The space also allows the insertion of a monitoring device through a monitoring fitting. Each monitor fitting will consist of a 100mm BSP fitting on the secondary tank.

A. Loading Conditions - Tank will meet design criteria below:
1. Internal Load: Tank will withstand without leakage a 35kPa .35153 kg/cm² pressure test. Installer will test prior to installation as this test is to test for leakage.
2. Vacuum Test: Every tank will be tested to 255 mm mercury vacuum by the tank manufacturer to assure structural integrity.
3. Surface Loads: Tank will withstand surface H-20 axle loads when properly installed according to current manufacturer's installation instruction.
4. External Hydrostatic Pressure: Tank will withstand 2133mm burden with the hole fully flooded with a 3:1 safety factor against buckling.
5. Tanks will support accessory equipment i.e. drop tubes, submersible pumps and ladders when installed according to tank manufacturer's recommendations and limitations.
6. Striker plates will be installed under each service fitting and manway opening.
7. B.S.P. Threaded Fittings.
   A. All threaded fittings will be of a material of construction consistent with the requirements of AS1210 and located as per drawings.
   B. All standard threaded fittings will be B.S.P. sockets and will be 100 mm diameter. Reducers are to be used for smaller sizes where shown and provided by installer.

B. Product Storage:
1. Tanks will be capable of storing petroleum products with a specific gravity up to 1:1; and will be chemically inert to petroleum products.
2. All tanks will be vented to atmosphere. Tanks are not designed as pressure vessels.
3. Tanks will be capable of storing gasoline or gasohol (10% ethenol and 90% gasoline mixture), 90.5% gasoline and 9.5% Oxinol-50* (4.75% methanol and 4.75% GTBA mixture); Dupont EPA waiver (gasoline with 5% methanol and a minimum 2.5% cosolvent - the blend may contain a maximum concentration of up to 3.7 weight percent oxygen in the final fuel); MTBE (methyltertarybutylether) - gasoline with up to 20%, by volume, of MTBE; jet fuel; av-gas; kerosene; diesel fuel; motor oil; or potable water at ambient underground temperatures; or used for fuel oil at temperatures not to exceed 66°C.

C. Materials: Tanks will be manufactured with 100% resin and glass fibre reinforced with no sand fillers.

D. Tank Dimensions (Refer FTS literature).

E. Webbing straps with "man out of hole" winding straps provided as standard. Number and location of straps to be determined by manufacturer. Straps will be capable of withstanding the buoyancy load of the tank diameter.

2.2 Optional Accessories

A. Manholes:
1. All manholes to be flanged at 600 ID complete with Australian Standard listed gaskets, black bolts and covers. For larger tanks 700NB manholes are available.
2. Location as shown on drawings.

B. Manhole Risers - Provide fibreglass manhole risers (not attached to manholes) to permit access to manhole. (Street box at grade level to be furnished by others).

C. Fill Tubes - Can be Aluminium and factory installed by manufacturer (optional).
1. Location as shown on drawing.
2. Aluminium tubes shall be 100 mm diameter with 100 mm threaded fitting.

D. Ladders – Will be standard ladder as supplied by tank manufacturer (aluminium).

3.0 Execution

3.1 Installation and Testing

Tanks will be tested and installed according to current installations instructions provided with the tank. (Refer to FTS Fibreglass publication and include as part of specification).

FIBRETANK SYSTEMS PTY LIMITED
ABN 98 095 717 525
52 Parker Street, Carrington NSW 2294
(PO Box 102)
Email mike@ftstanks.com
Phone 02 49612745 Fax 02 49622812
Mobile 0413 310 165

fts Tanks
For A Changing World

Facsimile

To:	Tony Pincevic	Date:	4th December 2009
Company:		Fax to:	02 4773 3231
From:	Mike Palmer	Page:	1 of 7

Tony,

The tank which was manufactured for you and delivered to site at the corner of Cranbrook and Londonderry roads, Londonderry on the 26th June of this year was a T55 (55,000ltr) Double Wall Single Compartment Fibreglass underground storage vessel.

This tank was designed and manufactured in accordance with AS 1940, AS 1692 and UL 1316.

The integrity of both the inner and outer walls is continuously monitored using a hydrostatic leak detection system.

I have also sent through a copy of the tank drawing, a Test Certificate for the tank as well as a Technical Data Sheet and our Warranty Statement.

If you have any queries, or need any further information, please do not hesitate to contact me.

Best Regards

Mike Palmer | Operations Manager - Fibreglass
52 Parker Street | PO Box 102 | Carrington NSW 2294
[redacted]
FIBRETANK SYSTEMS PTY LTD

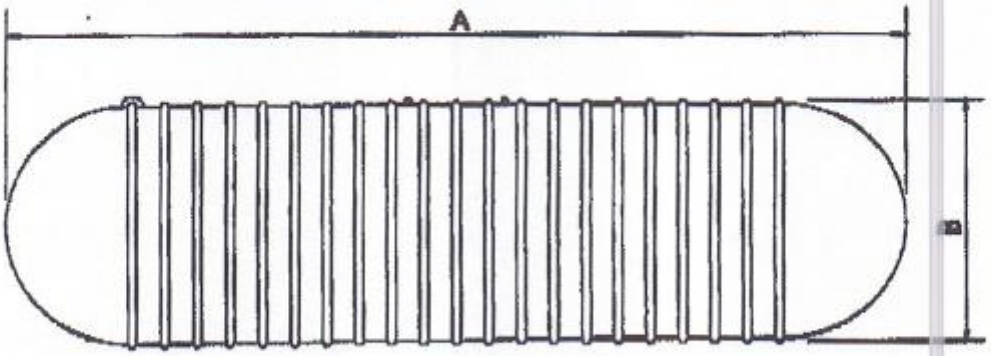
[redacted]

Fibreglass Tanks

fts Tanks
For A Changing World

Fibreglass Double Wall

DIMENSIONS AND CAPACITIES



Type	Capacity Litres	Double Wall Actual Capacity Litres	Length Overall 'A' mm	External Diameter 'B' mm	Double Wall Shipping Weight Kg	No. of Straps
DWII T2	2,000	2,170	1,700	1470	350	2
DWII T5	5,000	5,260	3,300	1470	500	2
DWII T10	10,000	11,100	3,592	2438	1000	2
DWII T15	15,000	14,882	4,462	2438	1250	2
DWII T20	20,000	20,200	5,742	2438	1600	2
DWII T25	25,000	25,800	7,092	2438	1900	2
DWII T30	30,000	29,950	7,857	2438	2100	4
DWII T35	35,000	35,150	9,217	2438	2500	4
DWII T40	40,000	40,650	10,432	2438	2800	4
DWII T45	45,000	44,000	11,284	2438	3100	4
DWII T50	50,000	50,650	12,967	2438	3300	6
DWII T55	55,000	55,450	13,817	2438	3450	6
DWII T60	60,000	60,350	8,714	3275	3600	4
DWII T70	70,000	70,200	9,974	3275	4000	4
DWII T80	80,000	81,200	11,234	3275	4500	4
DWII T90	90,000	91,840	12,494	3275	5000	6
DWII T110	110,000	112,341	15,179	3275	6500	7

Weights, Capacities & Dimensions are nominal only

Custom manufactured tanks can be supplied upon request

Tanks are supplied as standard with:

- Access Manways, Riser and Standard Cover (for pressure systems only)
- Hold Down Straps and Lifting Lugs
- Fill, Dip, Vent, Suction, Spare Point, Dipstick and Striker Plates
- Non Slip Surface on Tank Top - Tag Lines (Guide Rope)

Options and accessories available on request include:

- Water Tight Riser Cover • Dry and Wet Monitoring System • Driveway Covers
- Concrete Anchors and Hold Down Hardware for Bottom Anchoring
- Access Manways, Fabricated Steel Cover complete with 5 Sockets

Fibretank Systems Pty Ltd
ABN 95 095 717 585
52 Parker St
PO Box 102
Carrington NSW 2294 Australia

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Wb: www.ftstanks.com

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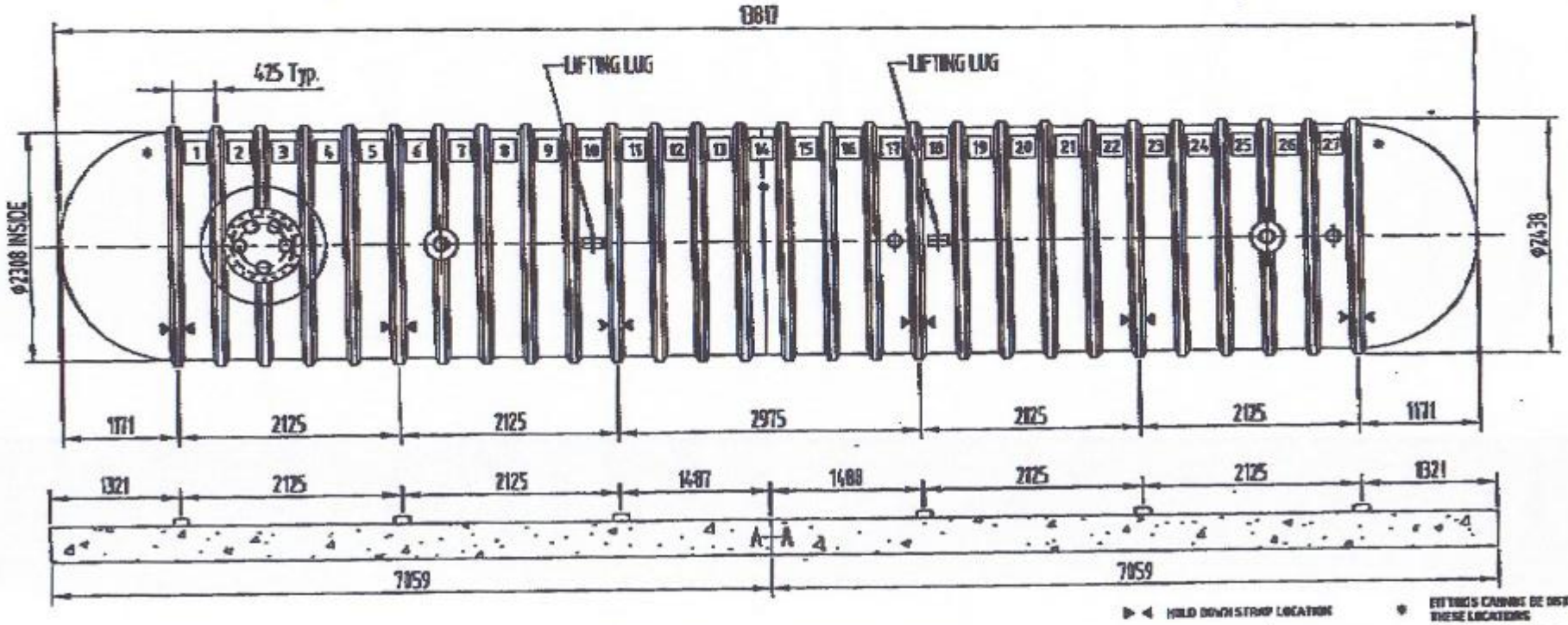

WOOLWORTHS PETROL STD

FITTING SCHEDULE				
FLAT No.	SIZE	ITEM	DESCRIPTION	Notes
27	100NB	SOCKET	100NB BSP SOCKET	
25-26	100NB	MONITOR	INTERSTIKE MONITOR SOCKET	
17	100NB	SOCKET	100NB BSP SOCKET	- No-Down Straps to suit this tank are part no.
5-7	100NB	MONITOR	INTERSTIKE MONITOR SOCKET	- Dashpan to suit this tank are part no.
2-3	600NB	MANHOLE	MANHOLE c/w COVER & 5 x 100NB SOCKETS, RISER & LID	- 600, all sockets are BSP and are c/w slotted plates under.

No	Revision Details	By	Date
A	Original Issue	-	-

DRAWN: KJH	App. Weight: 3,580 kg	Construction	Type	Compartment Configuration	DRAWING NUMBER: FD 055000-007
DATE: 31.10.05	App. Capacity: 54,776 L	DOUBLE WALL	TYPE 55	SINGLE	REVISION: B

The underground storage tanks are Fiberglass Reinforced Plastic (FRP) underground storage tanks as illustrated. Sizes & fittings shall be as noted. The tanks shall be "Century-Cast" tanks as manufactured by Fibretank Systems Tanks shall be buried & installed as per current specifications and instructions.

All dimensions in millimetres. All dimensions are nominal unless a manufacturing tolerance has been specified.

FIBRETANK SYSTEMS Pty Limited
PO BOX 102
CARRINGTON., NSW 2294
Ph(02)4961-2745 Fax(02)4962-2812

19. APPENDIX E– IMPORTED FILL CERTIFICATE

Orange Book

Hanson

Hanson Construction Materials Pty Ltd
ABN 90 009 [illegible] 734
Technical Services Centre – Bass Point
PO Box 402
Bass Point Quarry
Shellharbour NSW 2529
Tel (02) 42[illegible]6165
Fax (02) 4295 [illegible]39
www.hanson.biz

TECHNICAL SERVICES, WALLGROVE - TEST CERTIFICATE

Date 29/09/08

Certificate No. 29090SC

CUSTOMER - HANSON CONSTRUCTION MATERIALS PTY LTD

MATERIAL – 10mm DRAINAGE AGGREGATE - EX BASS POINT QUARRY
TEST(S) SAMPLED IN ACCORDANCE WITH AS1141.3.1 (CLAUSE 6.9.5(b))

SAMPLE DATE: 22/09/08
SAMPLE NO. 08-0904

AS1141.11 PARTICLE SIZE DISTRIBUTION

SIEVE SIZE	% PASSING
13.2mm	100
9.5mm	84
6.7mm	18
4.75mm	4
2.36mm	1

[redacted]

Approved Signatory – BRIAN FLINN

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

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NATA ACCREDITATION No. 485, [illegible]377