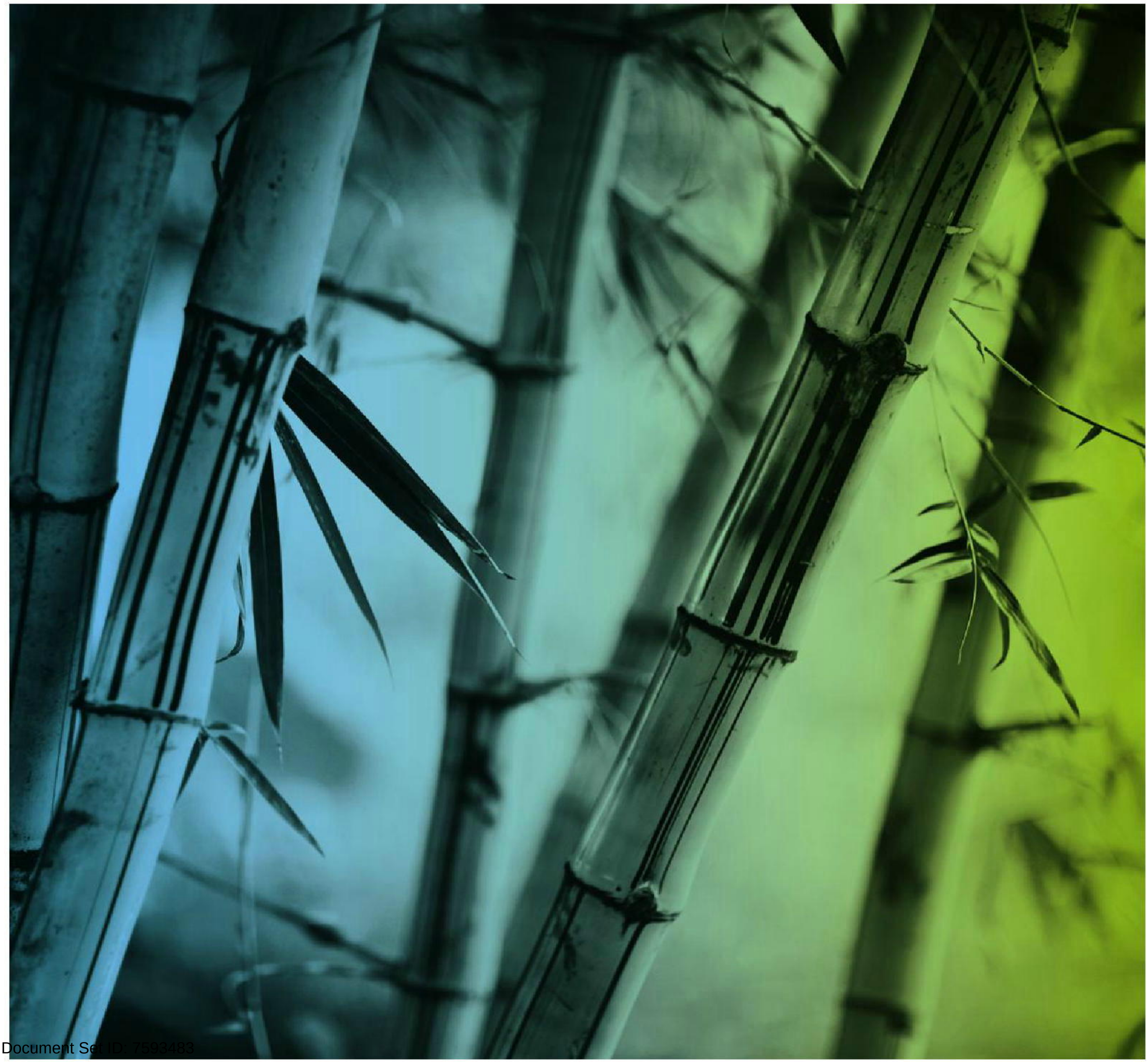
Caltex Werrington (28569)
Caltex Petroleum Australia Pty Ltd
16 May 2011

Groundwater Monitoring Event Report

Caltex Werrington (28569), Cnr Dunheved Rd and Henry Lawson, Werrington NSW



Groundwater Monitoring Event Report

Caltex Werrington (28569), Cnr Dunheved Rd and Henry Lawson, Werrington NSW

Prepared for

Caltex Petroleum Australia Pty Ltd

Prepared by

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Revision	Revision Date	Details	Authorised	
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AECOM's professional opinions are based upon its professional judgement, experience, and training. These opinions are also based upon data derived from the testing and analysis described in this document. It is possible that additional testing and analysis might produce different results and/or different opinions. AECOM has limited its investigation to the scope agreed upon with its client. AECOM believes that its opinions are reasonably supported by the testing and analysis that have been done, and that those opinions have been developed according to the professional standard of care for the environmental consulting profession in this area at this time. That standard of care may change and new methods and practices of exploration, testing, analysis and remediation may develop in the future, which might produce different results. AECOM's professional opinions contained in this document are subject to modification if additional information is obtained, through further investigation, observations, or validation testing and analysis during remedial activities.

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Glossary of Terms

General Terms	
AIP	Australian Institute of Petroleum
ANZECC	Australian and New Zealand Environment and Conservation Council
AHD	Australian Height Datum
AST	Above ground Storage Tank
BTEX	Benzene, toluene, ethylbenzene and xylenes
COC	Chain of Custody
COPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
DECCW	Department of Environment, Climate Change and Water NSW (formerly DEC & DECC)
DQI	Data Quality Indicator
DQO	Data Quality Objective
EPA	Environment Protection Authority
EQL	Estimated quantitation limit
GAC	Groundwater Assessment Criteria
GME	Groundwater Monitoring Event
LOR	Limit of Reporting (or EQL)
LPG	Liquefied petroleum gas
m bgs	Metres below ground surface
m btoc	Metres below top of casing
MNA	Monitored natural attenuation
MPE	Multi-phase extraction
NEPM	National Environment Protection Measure
PID	Photoionisation detector
POEO	Protection of the Environment Operations
PQL	Practical quantitation level (or limit)
PSH	Phase Separated Hydrocarbons
QA/QC	Quality Assurance and Quality Control
RPD	Relative Percent Difference
SAC	Soil Assessment Criteria
SWL	Standing Water level
TOC	Top of Casing
TPH	Total Petroleum Hydrocarbons
UPSS	Underground Petroleum Storage System
UST	Underground Storage Tank
VOC	Volatile Organic Compound
Units	
m	metre
mg/kg	milligrams/kilogram
mg/L	milligrams/litre
µg/kg	micrograms/kilogram

Executive Summary

Introduction

AECOM Australia Pty Ltd (AECOM) was commissioned by Caltex Australia Petroleum Pty Ltd (Caltex) to undertake a Groundwater Monitoring Event (GME) at the Caltex service station (Caltex No. 28569) located at the corner of Dunheved Road and Henry Lawson Drive, Werrington, NSW (the Site).

Objective

The objective of the GME was to assess concentrations of petroleum hydrocarbon in the groundwater at the Site.

Scope of Works

The GME comprised gauging and sampling of four existing wells (MW01 to MW04) and laboratory analysis of groundwater samples for the following contaminants of potential concern (CoPC):

- Total petroleum hydrocarbons (TPH);
- Benzene, toluene, ethylbenzene, xylenes (BTEX); and
- Lead.

Summary of Findings

The results of the GME indicated the following:

- Based on survey and standing water level (SWL) data, in May 2010 groundwater was inferred to be flowing towards the southwest. This inferred flow direction is comparable to historical GME data;
- PSH was observed, but not measured, in MW03. The apparent thickness has decreased since 2009 and appears to have remained stable since January 2010; and
- Laboratory analysis data indicated that concentrations of TPH and BTEX were at or near laboratory detection limits, and below the adopted groundwater assessment criteria.

1.0 Introduction

1.1 Preamble

AECOM Australia Pty Ltd (AECOM) was commissioned by Caltex Australia Petroleum Pty Ltd (Caltex) to undertake a Groundwater Monitoring Event (GME) at the Caltex service station (Caltex No. 28569) located at the corner of Dunheved Road and Henry Lawson Drive, Werrington, NSW (the Site).

This factual report presents the findings of the GME completed at the Site by AECOM in February 2011.

The Site location is provided in **Figure F1** and a plan showing the Site layout, monitoring well locations and the location of Underground Petroleum Storage System (UPSS) infrastructure is provided in **Figure F2**.

1.2 Objective

The objective of the GME was to assess concentrations of petroleum hydrocarbon in the groundwater at the Site.

1.3 Scope of Work

To achieve the objective, the following scope of work was undertaken:

- Review previous reports prepared for the Site;
- Prepare a site-specific Safety Plan;
- Gauge, purge and sample groundwater from four existing monitoring wells (MW01 to MW04);
- Laboratory analysis of groundwater samples by commercial analytical laboratories using methods registered by the National Association of Testing Authorities (NATA) to evaluate concentrations of the following contaminants of potential concern (CoPC):
    - Total petroleum hydrocarbons (TPH);
    - Benzene, toluene, ethylbenzene and xylenes (BTEX); and
    - Lead.
- Laboratory analysis of groundwater samples for monitored natural attenuation (MNA) parameters including:
    - Ferric and ferrous iron.
    - Manganese.
    - Nitrate and sulphate.
    - Methane.
    - Carbon dioxide.
    - Total organic carbon.
- Preparation of this factual GME Report.

Guidelines consulted during this investigation include:

- ANZECC/ARMCANZ, 2000 *Australian and New Zealand Environment Guidelines for Fresh and Marine Water Quality* (Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand);
- NEPC, 1999 *National Environment Protection (Assessment of Site Contamination) Measure National Environment Protection Council*;
- NSW Department of Environment and Climate Change (DECC), 2009. *Guidelines for Implementing the Protection of the Environment Operations (Underground Petrol Storage Systems) Regulation 2008*;
- NSW Environment Protection Authority (EPA), 1997. *Guidelines for Consultants Reporting on Contaminated Sites;*

- NSW Department of Environment and Conservation (DEC), 2006. *Guidelines for the NSW Site Auditor Scheme* (2nd edition);
- NSW DEC, 2007. *Guidelines for the Assessment and Management of Groundwater Contamination*; and
- NSW EPA, 1994. *Guidelines for Assessing Service Station Sites.*

The GME was undertaken in general accordance with:

- Caltex, 2007. *Environmental Site Assessment Specifications Site Upgrades*. January 2007; and
- Caltex, 2008. *Environmental Site Assessment Specifications*. January 2008.

2.0 Background Information

2.1 Site Description

The Site description details are provided in **Table 1**.

Table 1 Site Description Details

Item	Description
Site Identification	Caltex Werrington
Caltex Identification Number(1)	28569
Brand(1)	Caltex
Site Address	Dunheved Road (Corner of Henry Lawson Avenue) Werrington NSW
Title Identification Details(1)	Lot 4 in DP 565623
Site Elevation (m AHD)(2)	43
Site Owner	Caltex Petroleum Pty Ltd (CPPL)
Site Location	**Figure F1**
Site Layout	**Figure F2**
Site Within a DECC defined UPSS Sensitive Zone(3)	No

Notes:
1. Caltex Provided Information
2. Survey data
3. Website: www.environment.nsw.gov.au/clm/upss.htm

2.2 Previous Environmental Investigation Reports

AECOM is aware of two previous environmental investigation reports for the Site.

2.2.1 ENSR, 2009

ENSR completed a well installation and GME in February 2009. The results were presented in the following report:

- *Groundwater Monitoring Well Report, Caltex Werrington (28569), Corner Dunheved Road and Henry Lawson Avenue, Werrington NSW 2747*. Document No.: P3009301_RPTFinal_28April09, 28 April 2009.

The objectives of the investigation were to assess the condition of groundwater on the Site with respect to potential impacts to groundwater from UPSS infrastructure, and to assist Caltex to comply with the requirements of the POEO (UPSS) Regulation 2008.

The investigation found that:

- The measured groundwater flow direction was estimated to be to the northwest;
- Hydrocarbon odours were noted in groundwater from monitoring well MW03;
- Approximately 0.15 m of phase-separated hydrocarbons (PSH) was observed in monitoring well MW03. Chromatography of the PSH sample from MW03 reportedly resembled properties of petrol;
- Concentrations of TPH, Benzene, Toluene and Xylene above the adopted soil assessment criteria were detected in soil at BH03_2.0-2.3; and
- Elevated concentration of total lead (8000 µg/L) was detected in the PSH sample from MW03.

The report concluded that that the investigation completed assessed the current condition of groundwater in the vicinity of the current UPSS infrastructure on the Site and that the scope of work completed and results could be used to assist Caltex to comply with the requirements of the POEO (UPSS) Regulation 2008.

2.2.2 AECOM, 2011

AECOM completed a multi-phase extraction (MPE) remediation event and GME in April 2010, and the results were presented in the following draft report:

- *Multi-Phase Extraction and Groundwater Monitoring Event Report, Caltex Werrington (28569), Cnr Dunheved Rd and Henry Lawson Ave, Werrington NSW.* Document reference: 60153489 (AECOM, 2011).

The objectives of the works were to provide an interim groundwater management strategy for the phase-separated hydrocarbons (PSH) previously detected in MW03 and assess whether MPE was a suitable option for remediation for the Site conditions.

During the MPE event:

- 2.4 kg of hydrocarbons were extracted;
- 100 L of liquid were removed from the subsurface;
- Mass removal rate was reported to be 0.26 kg/hr from MW03;
- The groundwater extraction rate decreased during the MPE event (0.2 L/min to 0.11 L/min);
- Vapour analytical reports indicated that benzene concentrations decreased from 60,000 ppbv to 7,900 ppbv during the MPE event; and
- Groundwater drawdown was observed at two observation wells. Vacuum influence was not measured in the observation wells.

The report concluded that based on the findings of the MPE and GME, the MPE was suitable in removing PSH and dissolved phase hydrocarbons from groundwater in the vicinity of MW03.

2.3 Site Location and Surrounding Land uses

The Site is located at the corner of Dunheved Road and Henry Lawson Avenue in Werrington NSW and has street frontages to the south and east. The surrounding land uses included:

- North: Henry Lawson Club followed by residential properties;
- East: Henry Lawson Avenue followed by residential properties. Further to the east is the Dunheved Golf Club and South Creek;
- South: Dunheved Road followed by a shopping centre. Further south are residential properties. Werrington Lake and Werrington Creek are located approximately 700 m to the south; and
- West: A vacant block followed by residential properties.

2.4 Current Land Use & Site Features

At the time this investigation was completed (February 2011) the Site was an operational service station, mechanical workshop and retail shop. Site photographs are included in **Appendix C**.

Site features observed during the field activities are summarised below:

- The Site was predominantly covered by hard stand (concrete pavement);
- One sales building was located in the central portion of the Site;
- A mechanical workshop was present in the north-western corner of the Site;
- An automated car wash was situated along the eastern boundary of the Site;
- A total of six underground storage tanks (USTs) were present in the southwestern portion of the Site;
- A fill box was located along the western boundary of the Site;
- Liquefied petroleum gas (LPG) exchange cylinders were located along the western side of the retail shop; and
- An oil/water separator and silt trap was located in the southeastern portion of the Site.

Details of the identified USTs are provided on **Table 2.**

Table 2 Details of USTs

Tank ID	Capacity (L)	Product
DEPOT 1	45 000	Premium unleaded petrol (PULP)
DEPOT 2	45 000	PILP
DEPOT 3	45 000	Unleaded petrol (ULP)
DEPOT 4	45 000	ULP
DEPOT 5	27 400	V98
DEPOT 6	27 400	Diesel

2.5 Registered Groundwater Bore Search

The NSW Natural Resource Atlas website (http://www.nratlas.nsw.gov.au) indicated that no registered groundwater bores were present within a 1 km radius of the Site.

3.0 Groundwater Assessment Criteria

Guidance for determining the most appropriate guidelines to apply to groundwater analytical results in NSW, is provided by NSW DEC Guidelines for the Assessment and Management of Groundwater Contamination, 2007. These guidelines require that in assessing groundwater contamination all environmental values of the groundwater need to be identified and their relevance considered such that appropriate groundwater criteria are selected to assess groundwater quality at a site.

NSW DEC (2007) states that concentrations of potential contaminants of concern in groundwater at a site must be compared in the first instance against existing generic criteria, if available, which protect environmental values such as drinking water (provided in NHMRC & NRMMC, 2004) and aquatic ecosystems (provided in ANZECC & ARMCANZ, 2000). Groundwater quality is protected in NSW by the Protection of the Environment Operations Act (1997) and the Water Management Act (2000).

3.1 NHMRC & NRMMC (2004)

The NHMRC & NRMMC (2004) Guidelines state that drinking water should contain no harmful concentrations of chemicals or pathogenic microorganisms, and ideally it should be aesthetically pleasing in regard to appearance, taste and odour. These guidelines have been derived so as to take account of the needs of an individual through a normal lifetime, including changes in sensitivity that may occur between life stages.

3.2 ANZECC & ARMCANZ (2000)

The ANZECC & ARMCANZ (2000) provides 'Trigger' values for chemicals within water, which represent the best current estimates of the concentrations of chemicals that should have no significant adverse effects on the aquatic ecosystem. ANZECC & ARMCANZ (2000) indicates that an exceedence of a trigger value does not necessarily imply that there is an inherent risk, rather that further assessment and monitoring may be required prior to implementing appropriate management actions.

AECOM notes that while low reliability Trigger values have been derived within ANZECC & ARMCANZ (2000), their application is limited as the "*low reliability guideline trigger values were derived, in the absence of a data set of sufficient quantity, using larger assessment factors to account for greater uncertainty*", and that "*low reliability values should not be used as default guidelines*".

ANZECC & ARMCANZ (2000) stipulates that the identification of the receiving environment or the likely beneficial use of the water is essential for selection of the most applicable criteria.

3.3 Adopted Groundwater Assessment Criteria (GAC)

Given the proximity of Werrington Creek, a surface water body located approximately 700 m to the south of the Site, and South Creek approximately 1.1 km to the east of the Site, groundwater results from this GME have been compared to the ANZECC & ARMCANZ (2000) Trigger Levels for Fresh Waters. Trigger Levels with a 95% level of species protection has been adopted.

There are no current ANZECC & ARMCANZ (2000) high reliability assessment criteria for TPH in groundwater, although there is an interim, low reliability trigger level of 7 µg/L for crude oil in water. AECOM notes that crude oil contains hundreds of hydrocarbon compounds and current laboratory limits of reporting (LOR) cannot quantify TPH to this concentration. Consequently, no assessment criteria for TPH have been adopted.

Given that the bore search did not identify groundwater bores registered for drinking water purposes in the vicinity of the Site and that Grafton is supplied with a reticulated potable water supply, the NHMRC & NRMMC (2004) guidelines are not considered applicable to the Site. However, they have adopted as Groundwater Screening Criteria (GSC).

The adopted groundwater assessment criteria (GAC) are compared to the groundwater analytical results in **Table T1**.

4.0 Field Investigation

4.1 Summary of Field Activities

A summary of field activities undertaken on the Site is provided on **Table 3**.

Table 3 **Summary of Field Activities**

Field Activity	Date of Activity	Number of Locations
Gauge, Purge and Sample Groundwater Monitoring Wells	16 February 2011	4 (MW01 to MW04)

The collection of groundwater samples was undertaken by Heather Cross, a suitably qualified AECOM Environmental Scientist.

The Site works were completed in accordance with Australian Institute of Petroleum (AIP) work clearance procedures. The completed AIP form is provided in **Appendix D**.

4.2 Groundwater Sampling Methodology

Table 4 summarises the groundwater sampling methodology adopted for this GME.

Table 4 **Groundwater Sampling Methodology**

Activity	Details
Well gauging	The standing water levels (SWLs) in all monitoring wells were measured using an electronic water/oil interface meter, which was also suitable for detecting PSH. The measurements were taken on the same day and in as close succession as possible to minimise temporal variation. SWL gauging was completed prior to purging.
Groundwater sampling (MNA parameters)	Groundwater samples (for monitored natural attenuation [MNA] parameters) were collected using dedicated disposable bailers to reduce the potential for cross contamination. The MNA samples were collected after well gauging but prior to well purging.
Well purging	The wells were purged of three well volumes using dedicated bailers. Geochemical parameters (e.g. temperature, electrical conductivity, redox, dissolved oxygen and pH) were measured ex-situ by a calibrated water quality meter (WQM) during purging. Calibration records for the WQM are provided in **Appendix E**. Field data sheets are provided in **Appendix F**.
Groundwater sampling (non-MNA parameters)	Groundwater samples were collected using the dedicated bailers to reduce the potential for cross contamination. The bailers were disposed of following the collection of samples. Samples for lead analysis were field filtered (0.45 micron filter) and acid preserved.
Decontamination	Decontamination of the interface meter probe head was undertaken using a phosphate free detergent (Decon 90 Solution) followed by a double rinse with laboratory supplied deionised water.
QC samples	Quality control (QC) samples comprised collection of field duplicates, rinsate and trip blank samples (refer to **Section 5.0**).
Purge water disposal	Groundwater purged from the monitoring wells was placed in the Site's oil-water separator.

4.3 Laboratory Analysis

LabMark Environmental Laboratories (LabMark) in Sydney and Melbourne were used as the primary and secondary laboratory, respectively. Groundwater samples were submitted for analysis for TPH, BTEX, lead, total organic carbon, sulphate, nitrate, ferric iron, ferrous iron, manganese, carbon dioxide, and methane.

The laboratory analysis certificates are presented in **Appendix G**.

5.0 Quality of Analytical Data

5.1 Field Quality Control

The field Quality Assurance / Quality Control (QA/QC) procedures, Data Quality Objectives (DQOs) and data Quality Indicators (DQIs, or acceptance limits) established for the project are summarised below:

- Use of standard procedures for groundwater sampling;
- Use of a new pair of disposable nitrile gloves for each groundwater sample collection event;
- Use of dedicated groundwater sampling equipment;
- Use of calibrated field equipment;
- Use of appropriate equipment decontamination procedures;
- Use of laboratory prepared and supplied sampling containers appropriate for each COPC investigated;
- Use of appropriate sample Chain of Custody (COC) documentation.
- Copies of the COCs are included in the laboratory reports (**Appendix G**);
- Collection and analysis of field duplicate groundwater samples at a rate of approximately one per 10 primary samples;
- Collection and analysis of field inter-laboratory duplicate groundwater (i.e. split) samples at a rate of one per 20 primary samples;
- The relative percentage difference (RPD) of the primary and duplicate sample results are to be less than 50% for all COPC;
- Collection and analysis of a Trip Blank sample per sample batch. The DQI being that the concentrations of the COPC are to be less than laboratory limit of reporting (LOR); and
- Collection and analysis of one Rinsate Blank sample per day of sample collection. The DQI being that the concentrations of the COPC are to be less than laboratory LOR.

Field sampling QC analytical results presented on **Table T2** and are summarised below:

- One field duplicate (QC20) was analysed, meeting the DQI of one per ten primary samples;
- One split field duplicate (QC21) was analysed, meeting the DQI of one per twenty primary samples;
- One equipment rinsate blank sample (QC23) was collected and analysed, meeting the DQI of one per day. The rinsate blank was collected from the final rinse of the interface probe using laboratory supplied deionised water. Analysis results indicated that the COPC were not identified at concentrations above laboratory LORs;
- One Trip Blank (QC22) was utilised during this investigation, meeting the DQI of one per sampling event. Analysis results indicated that the COPC were not identified at concentrations above laboratory LORs; and
- The RPD of the primary and duplicate samples results met the DQI.

5.2 Laboratory Quality Control

The QA/QC procedures, DQOs and DQIs are summarised below:

- Maximum acceptable sample holding time is 14 days for organic analyses and six months for lead analyses;
- Samples to be appropriately preserved and handled;
- Laboratory LOR to be less than the adopted assessment criteria;
- Laboratory method blank analyses to be less than the laboratory LOR;
- Laboratory duplicate samples to be analysed at a rate of one in twenty samples, when the batch size exceeds five samples;

- Matrix spike recoveries to be conducted by the laboratory at a rate of one in twenty samples;
- Laboratory control sample (LCS) analysis to be conducted at a rate of one in twenty samples; and
- Matrix spike, LCS and surrogate recoveries to be within the range of 70-130%.

A review of laboratory QA/QC is summarised below:

- Laboratory LORs were below the adopted assessment criteria values;
- Samples were received by the laboratory chilled and intact;
- Groundwater samples were extracted and analysed within acceptable holding times;
- Method blank sample results were less than laboratory LORs;
- One laboratory duplicate was analysed (refer **Table T2**). The RPDs met the DQI of 50%;
- Matrix spike recoveries met the DQI; and
- Laboratory control sample and surrogate recoveries met the DQI.

5.3 Data Useability

The data validation procedure employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical results are representative groundwater conditions at the sample locations and that the overall quality of the analytical data produced is acceptably reliable for the purpose of this investigation

6.0 GME Results

6.1 Groundwater Gauging Data

The groundwater gauging data are presented on **Table T3** and are summarised below:

- The SWLs were between 2.200 metres below top of casing (m btoc) and 3.930 m btoc;
- The groundwater elevation was between 37.420 m AHD and 39.060 m AHD; and
- PSH (0.002 m) was observed in MW03 but was not detected by the interface probe.

Based on the SWL and survey data, groundwater at the Site is inferred to flow in a southwesterly direction (refer to **Figure F3**), similar to historical gauging events. AECOM notes that additional data points may indicate a different flow direction.

6.2 Groundwater Geochemical Parameters

The groundwater geochemical parameter measurements (and field observations) are presented in **Appendix F** and **Table T4** and are summarised below:

- No hydrocarbon odours or sheen were noted during the fieldwork;
- Stabilised dissolved oxygen measurements were between 1.72 and 2.05 parts per million (ppm), indicating a relatively aerobic environment;
- pH measurements were between 5.82 and 6.36, indicating a slightly acidic environment;
- Electrical conductivity measurements were between 25,552 and 31,297 microSiemens per centimetre (μS/cm), indicating brackish to saline conditions; and
- Redox measurements were between 190 and 340 millivolts (mV), suggesting oxidising conditions.

6.3 Groundwater Analytical Results

The results of the laboratory analysis of groundwater samples are presented on **Figure F4** and **Tables T1** and **T5**. In summary, the results were:

BTEX

Concentrations were below the adopted GAC in the groundwater samples analysed.

Lead

Lead was not identified at concentrations above the laboratory LOR in the samples analysed.

TPH

TPH fractions were not identified at concentrations above laboratory LORs in the groundwater samples analysed.

6.4 Comparison with Historical Groundwater Data

The current and previous GME analytical data are presented on **Table T6**. AECOM notes that TPH and BTEX concentrations generally remained the similar to historical investigations (at or near the laboratory detection limits).

- The PSH thickness in MW03 has remained stable since January 2010; and
- Over time, the BTEX concentrations in MW04 have decreased.

MNA Parameters

Based on the historical data available for MNA parameters, AECOM considers that monitoring wells MW01, MW02 and MW04 may be in the sulphate-reduction stage given the decrease in sulphate concentrations observed over time.

7.0 Summary of Findings

AECOM completed a GME to assess concentrations of petroleum hydrocarbon in the groundwater at the Site. The GME comprised gauging and sampling of four existing wells (MW01 to MW04) and laboratory analysis of groundwater samples. The results of the GME indicated the following:

- Based on survey and SWL data, in May 2010 groundwater was inferred to be flowing towards the southwest. This inferred flow direction is comparable to historical GME data;
- PSH was observed, but not measured, in MW03. The apparent thickness appears to have remained stable since January 2010; and
- Laboratory analysis data indicated that concentrations of TPH and BTEX were at or near laboratory detection limits, and below the adopted groundwater assessment criteria.

8.0 References

AECOM, 2011. *Multi-Phase Extraction and Groundwater Monitoring Event Report, Caltex Werrington (28569), Cnr Dunheved Rd and Henry Lawson Ave, Werrington NSW.* Document reference: 60153489, May 2011.

Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) 2003, *Minimum Construction Requirements for Water Bores in Australia*, Queensland Department of Natural Resources and Water.

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NSW Environment Protection Authority (EPA) 1994. *Guidelines for Assessing Service Station Sites,* December 1994.

NSW EPA 1997. *Guidelines for Consultants Reporting on Contaminated Sites*, November 1997.

Appendix A

Tables

Table T1 - Groundwater Sample Analytical Results

			Field_ID		MW01 POST	MW02 POST	MW03 POST	MW04 POST
			Sampled_Date		16/02/2011	16/02/2011	16/02/2011	16/02/2011
			Sample Type		Primary Sample	Primary Sample	Primary Sample	Primary Sample
	Units	LOR	GAC (Freshwater)	GSC (Drinking Water, Health)				
Metals								
Lead (Filtered)	µg/L	1	**3.4 (HR)**	**10.0**	<1	<1	-	<1
TPH								
TPH C 6 - C 9 Fraction	µg/L	50	**~**	**~**	<50	<50	-	<50
TPH C10 - C14 Fraction	µg/L	50	**~**	**~**	<50	<50	-	<50
TPH C15 - C28 Fraction	µg/L	200	**~**	**~**	<200	<200	-	<200
TPH C29-C36 Fraction	µg/L	50	**~**	**~**	<50	<50	-	<50
TPH+C10 - C36 (Sum of total)	µg/L	~	**~**	**~**	<200	<200	-	<200
BTEX								
Benzene	µg/L	1	**950 (LR)**	**1.0**	<1	<1	-	<1
Ethylbenzene	µg/L	1	**80 (LR)**	**300**	<1	<1	-	<1
Toluene	µg/L	1	**180 (LR)**	**800**	<1	<1	-	<1
Xylene (m & p)	µg/L	2	**275 (LR)**	**~**	<2	**3**	-	<2
Xylene (o)	µg/L	1	**350 (LR)**	**~**	<1	**1**	-	<1
Xylene Total	µg/L	~	**380 (LR)**	**600**	<3	**4**	-	<3

Notes

µg/L = micrograms per litre
LOR = Limit of Reporting
GAC = Groundwater Assessment Criteria
GSC - Groundwater Screening Criteria
(LR) = low reliability trigger level, (MR) = moderate reliability trigger level, (HR) = high reliability trigger level
# denotes sum of concentrations not calculable as all <LOR
< denotes result less than LOR
- denotes not analysed
~ denotes no value
BTEX = Benzene, Toluene, Ethylbenzene and Total Xylenes
TPH = Total Petroleum Hydrocarbons
BTEX & Lead Criteria = ANZECC (2000) Protection of Fresh Water Ecosystems (95%)
Total Xylene Criteria = NSW EPA (1994) Waters - Fresh Water Ecosystems
Drinking Water = health values in NHMRC & NRMMC (2004) Guildelines for Drinking Water Quality in Australia

Shading = Exceedence of GAC

Red Font = Screening Values

Table T2 - QA/QC Analytical Results

Sample ID	MW02 POST	QC20	RPD	QC21	RPD	QC22	QC23
Date	16/02/2011	16/02/2011		16/02/2011		16/02/2011	16/02/2011
Sample Type	Primary Sample	Duplicate		Triplicate		Trip Blank	Rinsate Blank
Units	mg/L	mg/L	%	mg/L	%	mg/L	mg/L
Metals							
Lead (Filtered)	<0.001	<0.001	nc	<0.001	nc	-	<0.001
TPH							
TPH C 6 - C 9 Fraction	<0.05	<0.05	nc	<0.02	nc	<0.05	<0.05
TPH C10-C14 Fraction	<0.05	<0.05	nc	<0.05	nc	-	<0.05
TPH C15 - C28 Fraction	<0.2	<0.2	nc	<0.1	nc	-	<0.2
TPH C29-C36 Fraction	<0.05	<0.05	nc	<0.1	nc	-	<0.02
TPH+C10 - C36 (Sum of total)	<0.2	<0.2	nc	nc	nc	-	nc
BTEX							
Benzene	<0.001	<0.001	nc	<0.001	nc	<0.001	<0.001
Toluene	<0.001	<0.001	nc	<0.001	nc	<0.001	<0.001
Ethylbenzene	<0.001	<0.001	nc	<0.001	nc	<0.001	<0.001
Xylene (m & p)	0.003	<0.002	nc	<0.001	nc	<0.002	<0.002
Xylene (o)	0.001	<0.001	nc	<0.002	nc	<0.001	<0.001
Xylene Total	0.004	<0.003	nc	nc	nc	nc	nc

Notes

µg/L = micrograms per litre

mg/kg = milligrams per kilogram

LOR = Limit of Reporting

nc = sum of concentrations not calculated as results <LOR

< denotes result less than LOR

- denotes not analysed

RPD = Relative Percent Difference

Split = inter laboratory duplicate

Table T3 - Groundwater Gauging Data

Well ID	Gauging Data	Event	Total Well Depth (m btoc)	TOC Elevation (m AHD)	SWL (m btoc)	PSH Thickness (m)	Measured Water Elevation (m AHD)
MW01	16/02/2011	PRE	5.930	41.580	2.520	No PSH	39.060
MW02	16/02/2011	PRE	9.920	41.350	3.930	No PSH	37.420
MW03	16/02/2011	PRE	9.870	40.770	2.495	0.002 (observed)	38.275
MW04	16/02/2011	PRE	6.870	41.220	2.200	No PSH	39.020

Notes

Total Well Depth (as measured on 16/02/2011)

SWL=Standing Water Level

AHD=Australian Height Datum

PSH=Phase Separated Hydrocarbon

PRE=Pre-Purging

m=Metres

TOC=Top of Casing

bgs=Below Ground Surface

- Indicates that Data is not available.

Table T4 - Groundwater Quality Parameters - Field Data

Well ID	PURGE DATE	EVENT	TEMP (°C)	DO (ppm)	EC (μScm-^{1})	Eh (mV)	pH	Purge Vol (L)	Comments
MW01	16/02/2011	Pre	22.9	1.70	30,378	383	5.10	1	Clear, no odour or sheen
		Post	22.0	2.05	31,297	340	5.82	10	Light brown, turbid, no odour or sheen
MW02	16/02/2011	Pre	23.4	1.07	20,908	275	5.97	1	Clear, no odour or sheen
		Post	21.7	1.72	25,552	190	6.36	24	Light brown, turbid, no odour or sheen
MW03	16/02/2011	No parameters taken due to presence of PSH							
MW04	16/02/2011	Pre	25.3	1.63	30,644	318	5.81	1	Clear, no odour or sheen
		Post	22.3	1.77	29,106	225	6.01	14	Brown, turbid, no odour or sheen

Notes

PRE=Pre-Purging

Post=Post-Purging

MW=Monitoring Well

DO=Dissolved Oxygen

ppm=part per million

EC=Electrical Conductivity

PSH=Phase Separated Hydrocarbons

L=Litres

mV=milli Volts

μScm-^{1} = microSiemens per centimetre

Table T5 - MNA Analytical Results

		Field_ID	MW01 PRE	MW02 PRE	MW03 PRE	MW04 PRE
		Sampled_Date	16/02/2011	16/02/2011	16/02/2011	16/02/2011
		Sample Type	Primary Sample	Primary Sample	Primary Sample	Primary Sample
	Units	**LOR**				
Methane	mg/L	0.05	<0.005	<0.005	-	<0.005
Carbon dioxide (free)	mg/L	5	590	340	-	440
Ferric Iron	mg/L	0.5	0.68	0.28	-	1.9
Ferrous Iron	mg/L	0.5	<0.5	<0.5	-	<0.5
Nitrate (as N)	mg/L	0.01	0.01	0.21	-	0.02
Sulphate	mg/L	2	740	440	-	780.0
Total Organic Carbon	mg/L	5	13	<5	-	7.3
Iron (filtered)	mg/L	0.05	0.68	0.28	-	1.9
Manganese (filtered)	mg/L	0.005	6.5	1.1	-	2.2

Notes

µg/L = micrograms per litre

LOR = Limit of Reporting

< denotes result less than LOR

Table T6 - Historical Analytical Results

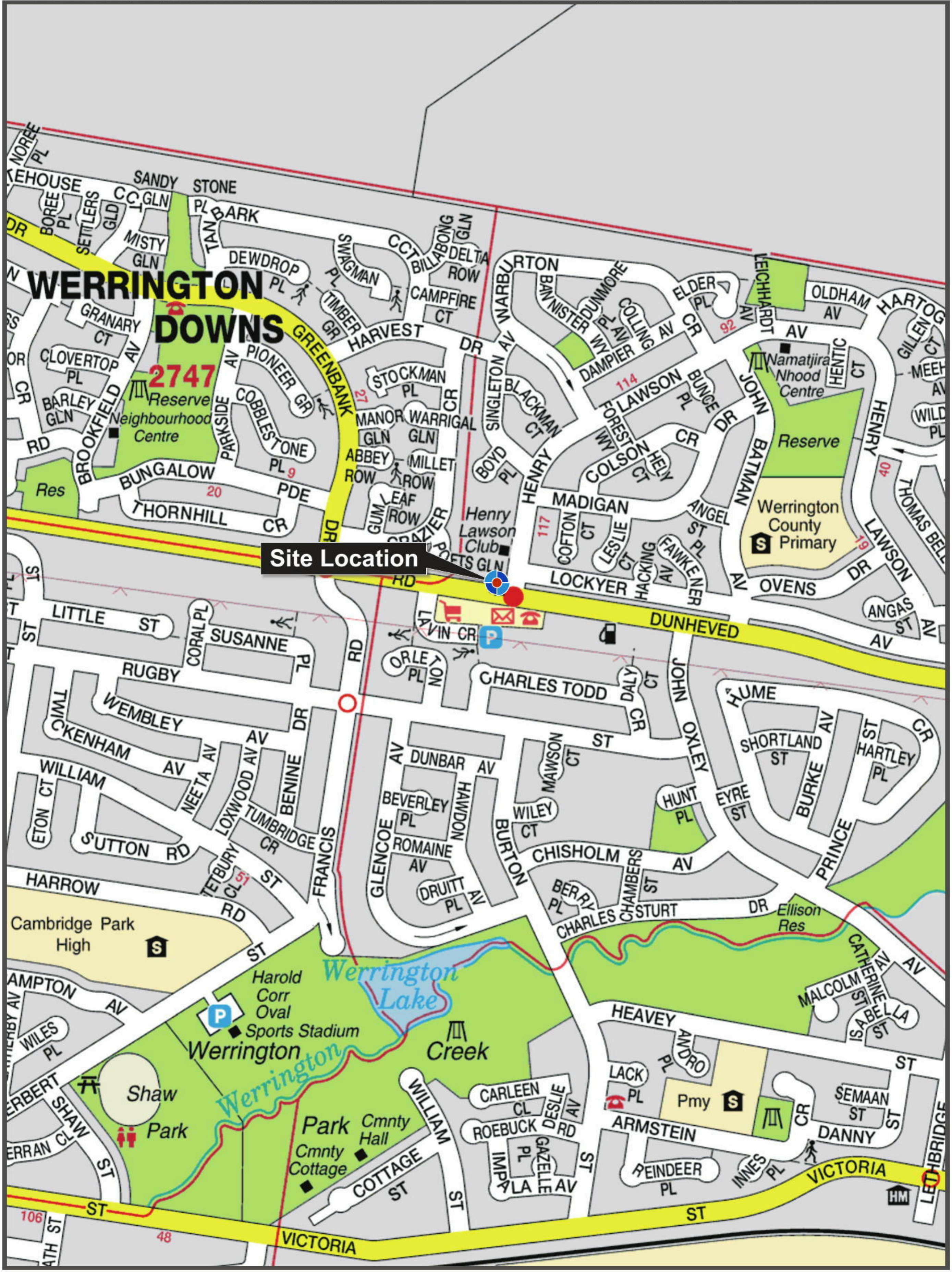
				TPH					BTEX						Metals				
Analyte			PSH Thickness Measured	TPH C 6 - C 9 Fraction	TPH C10 - C14 Fraction	TPH C15 - C28 Fraction	TPH C29-C36 Fraction	TPH+C10 - C36 (Sum of total)	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total	Calcium	Lead (Filtered)	Magnesium	Potassium	Alkalinity (total)
Units			m	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			**-**	**20**	**50**	**100**	**50**		**1**	**1**	**1**	**2**	**1**	**3**	**0.1**	**0.001**	**0.1**	**0.1**	**5**
MW01	MW01	28-Jan-09	-	<50	<50	<200	<50	<300	<1	<1	<1	<2	<1	<3	-	<0.001	-	-	-
	MW01	29-Apr-10	-	<50	<50	<200	<50	<300	<1	<1	4	3	1	4	40.5	0.011	1200	18.9	12
	MW01	16-Feb-11	-	<50	<50	<200	<50	<200	<1	<1	<1	<2	<1	<3	-	-	-	-	-
MW02	MW02	28-Jan-09	-	<50	<50	<200	<50	<300	<1	<1	<1	<2	<1	<3	-	<0.001	-	-	-
	MW02	29-Apr-10	-	<50	<50	<200	<50	<300	<1	<1	<1	<2	<1	<3	32.3	0.001	421	12.1	196
	MW02	16-Feb-11	-	<50	<50	<200	<50	<200	<1	<1	<1	3	1	4	-	-	-	-	-
MW03	MW03	28-Jan-09	0.150	122,000	125,000	300	<100,000	-	-	-	-	-	-	-	-	-	-	-	-
	MW03	01-Dec-09	0.008	Well gauging only		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MW03 (PreMPE)	18-Jan-10	0.011	Well gauging only		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MW03 (PostMPE)	18-Jan-10	0	9330	-	-	-	-	913	600	2040	1480	806	2286	-	-	-	-	-
	MW03	29-Apr-10	0.001	-	-	-	-	-	-	-	-	-	-	-	233	-	1280	32.1	862
	MW03	16-Feb-11	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW04	MW04	28-Jan-09	-	<50	<50	<200	<50	<300	2	<1	6	4	2	6	-	<0.001	-	-	-
	MW04	29-Apr-10	-	<50	<50	<200	<50	<300	<1	<1	<1	<2	<1	<3	95	<0.001	1400	24.4	213
	MW04	16-Feb-11	-	<50	<50	<200	<50	<200	<1	<1	<1	<2	<1	<3	-	-	-	-	-

Table T6 - Historical Analytical Results

			Inorganics									
Analyte			Chloride	Methane	Carbon Dioxide	Sodium	Ferric Iron	Ferrous Iron	Manganese	Nitrate (as N)	Sulphate	TOC
Units			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			**1**	**0.05**	**5**	**0.1**	**0.5**	**0.5**	**0.005**	**0.01**	**2**	**1**
MW01	MW01	28-Jan-09	-	-	-	-	-	-	-	-	-	-
	MW01	29-Apr-10	12000	-	-	5780	0.6	<0.5	9.5	0.03	2000	2
	MW01	16-Feb-11	-	<0.005	590	-	0.68	<0.5	6.5	0.01	740	13
MW02	MW02	28-Jan-09	-	-	-	-	-	-	-	-	-	-
	MW02	29-Apr-10	4800	-	-	3270	2.4	2.2	3.65	0.03	1420	<1
	MW02	16-Feb-11	-	<0.005	340	-	0.28	<0.5	1.1	0.21	440	<5
MW03	MW03	28-Jan-09	-	-	-	-	-	-	-	-	-	-
	MW03	01-Dec-09	-	-	-	-	-	-	-	-	-	-
	MW03 (PreMPE)	18-Jan-10	-	-	-	-	-	-	-	-	-	-
	MW03 (PostMPE)	18-Jan-10	-	-	-	-	-	-	-	-	-	-
	MW03	29-Apr-10	10500	-	-	5590	5.8	<0.5	4.2	0.03	1650	8
	MW03	16-Feb-11	-	-	-	-	-	-	-	-	-	-
MW04	MW04	28-Jan-09	-	-	-	-	-	-	-	-	-	-
	MW04	29-Apr-10	11300	-	-	6040	0.6	<0.5	3.16	0.02	2370	<1
	MW04	16-Feb-11	-	<0.005	440	-	1.9	<0.5	2.2	0.02	780	7.3

Appendix B

Figures



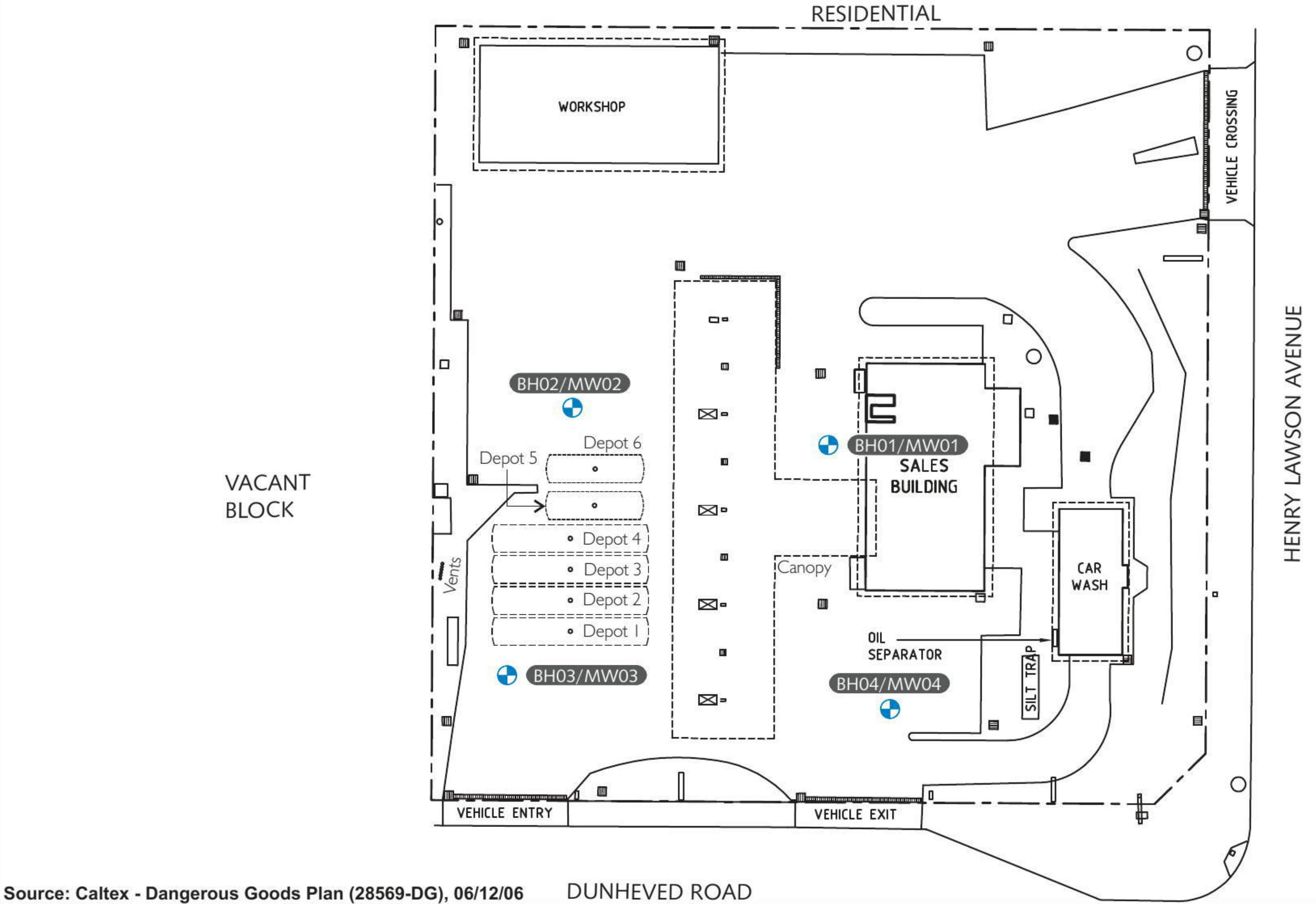
PROJECT ID:	60153489
CREATED BY:	TO
LAST MODIFIED:	TO 05 04 2010

AECOM
www.aecom.com

Site Location

Caltex Australia Pty Ltd
Groundwater Monitoring Event
Caltex Werrington (28569)
Cnr Dunheved Rd & Henry Lawson Ave
Werrington NSW 2747

Figure
F1



Source: Caltex - Dangerous Goods Plan (28569-DG), 06/12/06

Tank Details

Tank ID	Capacity (L)	Product
DEPOT 1	45 000	PULP
DEPOT 2	45 000	PULP
DEPOT 3	45 000	ULP
DEPOT 4	45 000	ULP
DEPOT 5	27 400	V98
DEPOT 6	27 400	Diesel

Key

☒	Fuel dispensing pump
▭	UST
◑	Borehole/monitoring well location

PROJECT ID: 60153489
CREATED BY: TO
LAST MODIFIED: TO 19 04 2011

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0 15m

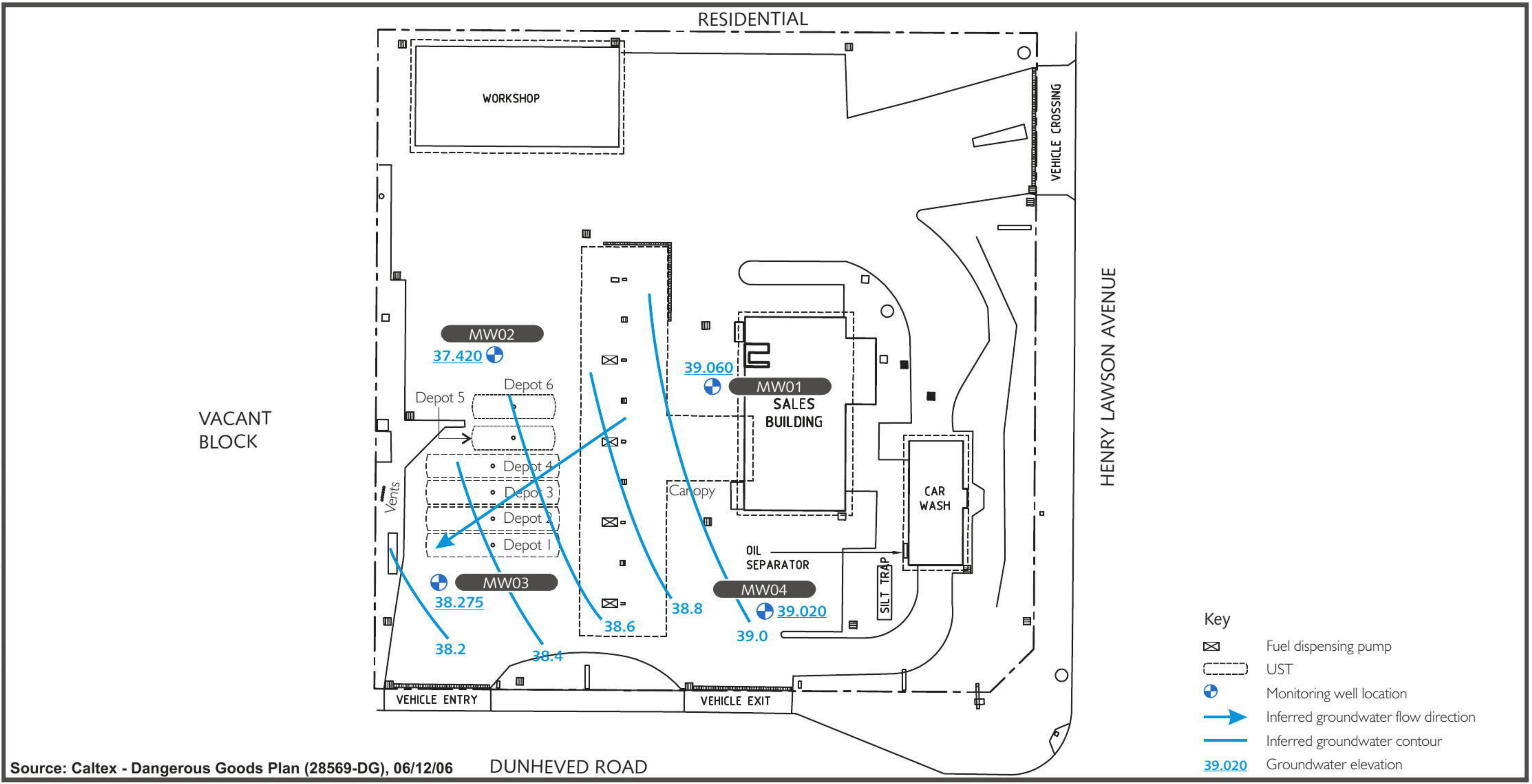
Site Layout and Monitoring Well Locations

Caltex Australia Pty Ltd
Groundwater Monitoring Event
Caltex Werrington (28569)
Cnr Dunheved Rd & Henry Lawson Ave
Werrington NSW 2747

Figure
F2

Map Document: G:\Projects\60153489 Caltex Werrington GME\60153489 F2 Rev A

A4 Size



Source: Caltex - Dangerous Goods Plan (28569-DG), 06/12/06

PROJECT ID: 60153489
CREATED BY: TO
LAST MODIFIED: TO 05 04 2011

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Note: *MW02 omitted due to anomalous data*

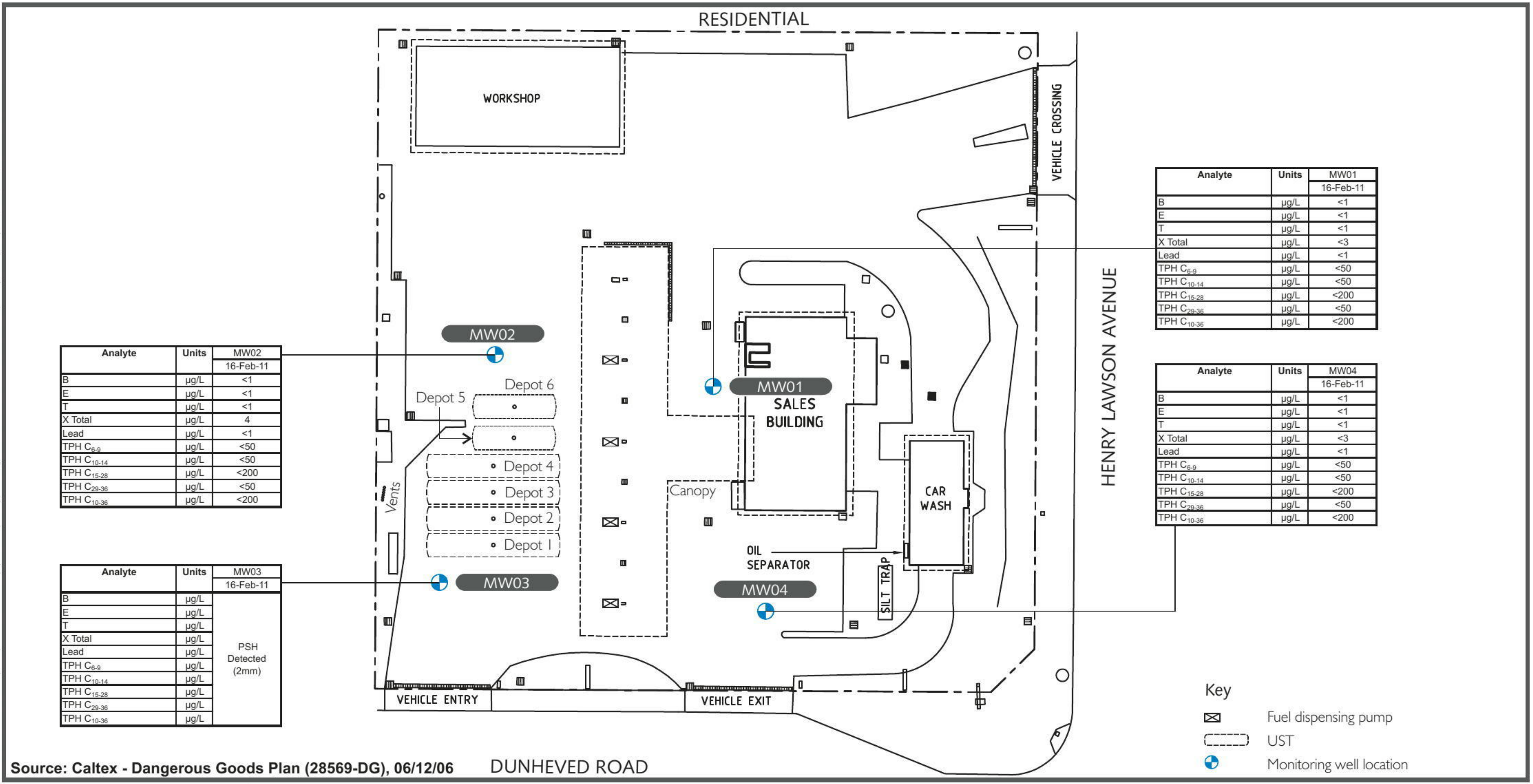
Groundwater Elevation Plan

Caltex Australia Pty Ltd
Groundwater Monitoring Event
Caltex Werrington (28569)
Cnr Dunheved Rd & Henry Lawson Ave
Werrington NSW 2747

Figure
F3

Map Document: G:\Projects\60153489 Caltex Werrington GME\60153489 F3

A4 Size



Analyte	Units	MW02
		16-Feb-11
B	µg/L	<1
E	µg/L	<1
T	µg/L	<1
X Total	µg/L	4
Lead	µg/L	<1
TPH C_{6-9}	µg/L	<50
TPH C_{10-14}	µg/L	<50
TPH C_{15-28}	µg/L	<200
TPH C_{29-36}	µg/L	<50
TPH C_{10-36}	µg/L	<200

Analyte	Units	MW03
		16-Feb-11
B	µg/L	PSH Detected (2mm)
E	µg/L	
T	µg/L	
X Total	µg/L	
Lead	µg/L	
TPH C_{6-9}	µg/L	
TPH C_{10-14}	µg/L	
TPH C_{15-28}	µg/L	
TPH C_{29-36}	µg/L	
TPH C_{10-36}	µg/L	

Analyte	Units	MW01
		16-Feb-11
B	µg/L	<1
E	µg/L	<1
T	µg/L	<1
X Total	µg/L	<3
Lead	µg/L	<1
TPH C_{6-9}	µg/L	<50
TPH C_{10-14}	µg/L	<50
TPH C_{15-28}	µg/L	<200
TPH C_{29-36}	µg/L	<50
TPH C_{10-36}	µg/L	<200

Analyte	Units	MW04
		16-Feb-11
B	µg/L	<1
E	µg/L	<1
T	µg/L	<1
X Total	µg/L	<3
Lead	µg/L	<1
TPH C_{6-9}	µg/L	<50
TPH C_{10-14}	µg/L	<50
TPH C_{15-28}	µg/L	<200
TPH C_{29-36}	µg/L	<50
TPH C_{10-36}	µg/L	<200

Source: Caltex - Dangerous Goods Plan (28569-DG), 06/12/06

PROJECT ID: 60153489
CREATED BY: TO
LAST MODIFIED: TO 19 04 2011

AECOM
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Groundwater Analytical Results

Caltex Australia Pty Ltd
Groundwater Monitoring Event
Caltex Werrington (28569)
Cnr Dunheved Rd & Henry Lawson Ave
Werrington NSW 2747

Figure
F4

Map Document: G:\Projects\60153489 Caltex Werrington GME\60153489 F4 Rev A

A4 Size

Appendix C

Site Photographs

PHOTOGRAPHIC LOG

Site Name: Caltex Werrington (Caltex ID 28569)	**Site Location:** Corner Dunheved Rd and Henry Lawson Drive, Werrington NSW	**Project No:** 60153489-200

Plate No. 1

Date: 16/02/11

Direction Photo Taken:

Not applicable

Description:

Approximately 0.002m of greenish PSH was observed in the bailer collected from MW03. The PSH was not detected by the interface probe.

Plate No. 2

Date: 16/02/11

Direction Photo Taken:

North-northeast

Description:

The active workshop/mechanic shop at the Site.

PHOTOGRAPHIC LOG

Site Name: Caltex Werrington (Caltex ID 28569)	**Site Location:** Corner Dunheved Rd and Henry Lawson Drive, Werrington NSW	**Project No:** 60153489-200

Plate No. **3**	**Date:** 16/02/11

Direction Photo Taken:

Southeast

Description:

Photograph (towards Dunheved Road) showing the southern fuel dispensers and UST access points in the forecourt.

Plate No. **4**	**Date:** 16/02/11

Direction Photo Taken:

Northeast

Description:

Photograph the northern fuel dispensers and northern forecourt area.

PHOTOGRAPHIC LOG

Site Name: Caltex Werrington (Caltex ID 28569)	**Site Location:** Corner Dunheved Rd and Henry Lawson Drive, Werrington NSW	**Project No:** 60153489-200

Plate No. **5**	**Date:** 16/02/11

Direction Photo Taken:

West

Description:

Photograph showing the southwest corner of the site adjacent to Dunheved Road.

Plate No. **6**	**Date:** 16/02/11

Direction Photo Taken:

South

Description:

Photograph showing the western forecourt area of the Site, looking towards Dunheved Road.

Appendix D

Work Permits

WORK CLEARANCE FORM

Australian Institute of Petroleum

THIS FORM MUST BE COMPLETED BEFORE WORK COMMENCES (except for completion signatures)
IF WORK EXTENDS BEYOND ONE DAY, A NEW FORM MUST BE COMPLETED FOR EACH DAY

Contractor Company Name: AECOM
Oil Company: Caltex
Location Name: Caltex Werrington
Job/Order No.: 60153489-200
Address: Cnr Dunheved rd & Henry Lawson dr. Werrington
Work Description: Groundwater sampling
Tools/Equipment to be used: Interface probe, water quality meter, teflon bailer, bottles

Refer relevant Hazards Map and identify work location for completion of checklist. Tick ☐ below

☑ Inside and outside hazardous areas within the site boundary Complete Sections A, B, C
☐ Inside Office/Sales Building Complete Sections A, C

Section A - Conditions

The contractor is to check that all of the following conditions are acceptable:
Write **"YES/NO"** when checked:

- Yes All STATUTORY REGULATIONS applying to the job shall be complied with
- Yes LPG or PETROLEUM PRODUCTS delivery into site storage tanks will not impact work
- Yes FLAMMABLE or COMBUSTIBLE product and/or materials within 8 metres of work area will not impact work
- Yes There is NO ENTRY into any EXCAVATION or PIT, or into any TANK or other Confined Space eg. turret, pit, sump etc.

If any NO answers the Contractor is to refer to the Client Company for permit or authorization.

Section B - Inside and Outside Hazardous Areas (*refer to Hazards Map to verify*)

The contractor is to check that any device that can produce or cause a source of ignition will not be operated within the site boundary
Write **"YES/NO"** when checked:

- Yes Electrical equipment (including all battery operated items such as cordless drills) (intrinsically safe)
- Yes Petrol driven devices NA
- Yes Excavation equipment (motorised) NA
- Yes Blow torches / soldering equipment NA
- Yes Oxy-acetylene or electric welding equipment NA
- Yes Matches / cigarette lighters NA
- Yes Concrete cutting, breaking or drilling equipment NA
- Yes Grinding equipment NA
- Yes Any other device which can produce or cause a source of ignition NA

For Reference Work Permit Number Where Applicable
....

If any YES answers the Contractor is to refer to the Client Company for permit or authorization.

Section C - Precautions to be taken - All Work - Contractor must ensure the Work Area is Safe

"YES"	"N/A" - (Not Applicable)	
☑		Dry Powder fire extinguishers (9kg min. or equivalent) within work area
☑		Protective clothing and full cover footwear to be worn
☑		Safe access / egress to and from works area
☐	☑	Work "At Heights" complies with WH&S regulations
☐	☑	Electrics isolated and tagged and locked out where possible
☐	☑	Transfer and/or Dispensing pumps to be shut down – valves closed
☑	☐	Barriers erected around work area
☐	☑	Extension cables must not cross the hazardous areas
☐	☑	Wet down area for concrete breaking or drilling
☐	☑	Check work will not affect underground services, eg. telephone, electricity, pipelines, etc.

} All in accordance with statutory and client requirements

ADDITIONAL PRECAUTIONS
(to be completed by contractor if necessary)
____
____
____

JSA COMPLETED
Reference No ____________

No work to be commenced until "YES" or "N/A" apply and are ticked

TIME ON SITE START TIME: 7:40 [✓ AM] / PM FINISH TIME: 12:30 AM / [✓ PM]

- The contractor will observe the above conditions and precautions for work undertaken for this job.

CONTRACTOR (Print Name): Dirk Sanderson
Signed: 16/2/11

CONTRACTOR (Print Name): Dirk Sanderson
Signed: 16/2/11

- The Site Operator or Manager acknowledges that this job will be undertaken, and witnesses the Contractor's signature.

SITE OPERATOR/MANAGER: Imao (Print Name)
Signed: 16/2/11

SITE OPERATOR/MANAGER*: Tania Rowley (Print Name)
Signed: 16/2/11

* Print name only if different from start signature.

COMMENTS: ____________________
____
____

White Copy to be sent with the contractor's invoice, if requested by the oil company. Blue Copy to be left at site. Green Copy to be filed by the contractor.

Appendix E

Calibration Records

Water Quality Meter – Calibration For

Serial Number: 09K100174 Cattex Werrington
Frequency : Daily on use

Model No.	Date/Time	pH 4	pH 7	Conductivity (µS/cm) 2549 @ 21°C	Redox (mV)	Signature
YSI Quatro Pro Plus	815am 16·2·11	4·09	6·75	2549	–	

Appendix F

Field Data

Site Contamination Analysis - Ground Water Sampling Form

Project Name: Caltex Werrington	Well No: MW01
Project Number: 60153489 - 200	Well Type: ☑ Monitor ☐ Extractor ☐ Other
Recorded By: HC + OS	Well Material: ☑ PVC ☐ SS ☐ Other
Date: 16 · 2 · 11	Sample by: HC + OS

Well Purging

Purge Volume

Well Diameter (D in mm): ☑ 50 ☐ 100 ☐ Other

Total Depth of Well (TD in m BTOC): 5·930

Water Level Depth WL in m BTOC): 2·520

Number of well volumes to be purged (# VOLS)

☑ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other

Purge Method

☑ Bailer – Type: ☐ PVC ☐ SS ☑ Teflon ☐ Other

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

Pump Intake Setting

Depth (m BTOC)

Screen Interval (m BTOC) – Top: Bottom:

Purge Volume Calculation

(5·930 TD (m) - 2·520 WL (m)) x (50 D/2 (mm) /2)² x 3 #VOLS x 0.00314 = 20·5 Calculated Purge Volume (L)

PURGETIME ______ PURGE RATE ______ ACTUAL PURGE VOLUME ______

Start: 9:00 Stop: Elapsed: Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Other	
	1	1·70	30378	5·10	177·8	22·9	Clear, NOC		
	5	1·84	31128	5·71	153·8	22·2	light brown, turbid, NOC		
	10	2·05	31297	5·82	134·6	22·0	As above		
						becoming dry at 12L			
		Well dry at 14L. Sample taken							

Observations during purging (well condition, tubidty, colour, odour, sheen): Good well condition. Clear changing to light brown & turbid, NOC.

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☑ Other Oil & water separator

Well Sampling

Sampling Method

☑ Same as purge method

☑ Bailer – Type: ☑ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
MW01 pre					
MW01 post					

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No

AECOM

Site Contamination Analysis - Ground Water Sampling Form

Project Name: Caltex Werrington	Well No: MW02
Project Number: 60153489-200	Well Type: ☑ Monitor ☐ Extractor ☐ Other
Recorded By: HC + OS	Well Material: ☑ PVC ☐ SS ☐ Other
Date: 16.2.11	Sample by: HC + OS

Well Purging

Purge Volume

Well Diameter (D in mm): ☑ 50 ☐ 100 ☐ Other

Total Depth of Well (TD in m BTOC): 9.920

Water Level Depth WL in m BTOC): 3.930

Number of well volumes to be purged (# VOLS)

☑ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other

Purge Method

☑ Bailer – Type: ☑ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

Pump Intake Setting

Depth (m BTOC)

Screen Interval (m BTOC) – Top: Bottom:

Purge Volume Calculation

(9.920 TD (m) - 3.930 WL (m)) x (50 D/2 (mm) /2)² x 3 #VOLS x 0.00314 = ____ Calculated Purge Volume (L)

PURGE TIME ____ PURGE RATE ____ ACTUAL PURGE VOLUME ____

Start: 1030 Stop: Elapsed: Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Other	
	1	1.07	20908	5.97	69.6	23.4	light brown, turbid		
	8	1.47	21828	6.04	55.3	22.4			
	19	1.89	23293	6.46	23.7	21.9			
	24	1.72	25552	6.36	-15.4	21.7			
- well becoming dry at 28L, sample taken -									

Observations during purging (well condition, tubidty, colour, odour, sheen): - good well cond. clear then turbid brown, no odour or sheen

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☑ Other oil / water seperator

Well Sampling

Sampling Method

☑ Bailer – Type: ☑ PVC ☐ SS ☐ Teflon ☐ Other

☑ Same as purge method

☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
MW02 pre					
MW02 post					

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
MW02 post	QC20				
	QC21				

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AECOM

Site Contamination Analysis - Ground Water Sampling Form

Project Name: Caltex Werrington	Well No: MW03
Project Number: 60153489 - 200	Well Type: ☑ Monitor ☐ Extractor ☐ Other
Recorded By: HC + OS	Well Material: ☑ PVC ☐ SS ☐ Other
Date: 16 . 2 . 11	Sample by: HC + OS

Well Purging

Purge Volume

Well Diameter (D in mm): ☑ 50 ☐ 100 ☐ Other
Total Depth of Well (TD in m BTOC): 9.870
Water Level Depth WL in m BTOC): 2.495
Number of well volumes to be purged (# VOLS)
☑ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other

Purge Method

☑ Bailer – Type: ☑ PVC ☐ SS ☐ Teflon ☐ Other
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

Pump Intake Setting

Depth (m BTOC)
Screen Interval (m BTOC) – Top : Bottom:

Purge Volume Calculation

(________ - ________) x (______/2)^2 x ________ x 0.00314 = ________
TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME________ PURGE RATE________ ACTUAL PURGE VOLUME________

Start: 1015 Stop: Elapsed: Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Other	
-2mm of green PSH observed in first bailer purged -									

Observations during purging (well condition, tubidty, colour, odour, sheen): -

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☑ Other oil / water seperator

Well Sampling

Sampling Method

☑ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
N/A					

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No

AECOM

Site Contamination Analysis - Ground Water Sampling Form

Project Name: Caltex Werrington
Project Number: 60153489 - 200
Recorded By: HC + DS
Date: 16.2.11

Well No: MW 04
Well Type: ☑ Monitor ☐ Extractor ☐ Other
Well Material: ☑ PVC ☐ SS ☐ Other
Sample by: HC + DS

Well Purging

Purge Volume

Well Diameter (D in mm): ☑ 50 ☐ 100 ☐ Other
Total Depth of Well (TD in m BTOC): 6.870
Water Level Depth WL in m BTOC): 2.200
Number of well volumes to be purged (# VOLS)
☑ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other

Purge Method

☑ Bailer – Type: ☑ PVC ☐ SS ☐ Teflon ☐ Other
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

Pump Intake Setting

Depth (m BTOC)
Screen Interval (m BTOC) – Top: Bottom:

Purge Volume Calculation

(6.870 TD (m) - 2.200 WL (m)) x (50 D/2 (mm) /2)² x 3 #VOLS x 0.00314 = 28 L Calculated Purge Volume (L)

PURGE TIME ________ PURGE RATE ________ ACTUAL PURGE VOLUME ________

Start: 942 Stop: Elapsed: Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Other	
	1	1.63	30644	5.81	113.1	25.3			
	7	1.77	29106	5.83	54.4	22.3		clear no	
- well becoming		dry	at 12.5 L					brown, turbid	noc
	14	3.93	28663	6.01	20.0	21.9			

Observations during purging (well condition, turbidity, colour, odour, sheen): -
clear then
good well cond.ⁿ turbid brown no odour or sheen

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☑ Other oil / water seperator

Well Sampling

Sampling Method

☑ Bailer – Type: ☑ PVC ☐ SS ☐ Teflon ☐ Other
☑ Same as purge method
☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
MW04 pre					
MW04 post					

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No

Printed copies of this document are uncontrolled

QA/QC Sample Register

Site: Caltex Werrington
Project No: 60153489-200

QA/QC Sample No	Date Sampled	Person	Type (i.e. rinsate, trip, duplicate, triplicate)	Analysis Requested	Laboratory
QC20	16·2·11	HC	dup of MW02 post	BTEX, TPH, Pb	LM-Syd.
QC21	↓	↓	trip of MW02 post	"	LM-Melb.
QC22			trip blank	BTEX, TPH C6-C9	LM-Syd.
QC23			rinsate blank	↓	↓

Appendix G

Laboratory Reports

mgt LabMark
ENVIRONMENTAL LABORATORIES

ABN – 50 005 085 521 e.mail : mgt@mgtenv.com.au web : www.mgtenv.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 9564 7055
NATA Acc # 1261

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA Acc # 1645

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Sample Receipt Advice

Company name: **AECOM Aust P/L Sydney**

Contact name: Heather Cross
Client job number: CALTEX WERRINGTON 60153489-200
COC number: Not provided
Turn around time: 5 Day
Date received: Feb 16, 2011
MGT lab reference: **290784**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Organic samples had Teflon liners.

☑ Sample containers for volatile analysis received with zero headspace.

☑ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

QC21 sent to mgt Labmark Melbourne | Dissolved Metals (to reflect preservation), Methane & TOC by mgt Labmark Melbourne - results may be delayed.

Contact notes

If you have any questions with respect to these samples please contact:

Leanne Knowles on Phone : +61 2 9476 6533 or by e.mail: leanne.knowles@labmark.com.au

Results will be delivered electronically via e.mail to Heather Cross - heather.cross@aecom.com.

mgt Labmark Sample Receipt

Certificate of Analysis

AECOM Aust P/L Sydney
Level 5, 828 Pacific Hwy
Gordon
NSW 2072

NATA Accredited
Laboratory Number 1261

The tests covered by this document have been performed in accordance with NATA and ISO/IES 17025 and are traceable to national standards of measurement.
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WORLD RECOGNISED
ACCREDITATION

Attention: Heather Cross

Report	290699-W
Client Reference	CALTEX WERRINGTON 60153489-200
Received Date	Feb 17, 2011

Client Sample ID			**QC21**
Sample Matrix			**Water**
mgt-LabMark Sample No.			**11-FE08021**
Date Sampled			**Feb 16, 2011**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9 Fraction by GC	0.02	mg/L	< 0.02
TRH C10-C14 Fraction by GC	0.05	mg/L	< 0.05
TRH C15-C28 Fraction by GC	0.1	mg/L	< 0.1
TRH C29-C36 Fraction by GC	0.1	mg/L	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1
Monocyclic Aromatic Hydrocarbons			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
o-Xylene	0.001	mg/L	< 0.001
Total m+p-Xylenes	0.002	mg/L	< 0.002
Xylenes(ortho.meta and para)	0.003	mg/L	< 0.003
Fluorobenzene (surr.)	1	%	89
Heavy Metals			
Lead (filtered)	0.001	mg/L	< 0.001

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - Method: TRH C6-C36 - MGT 100A	Oakleigh	Feb 17, 2011	14 Day
Monocyclic Aromatic Hydrocarbons - Method: USEPA 8260B - MGT 350A Monocyclic Aromatic Hydrocarbons	Oakleigh	Feb 17, 2011	14 Day
Heavy Metals - Method: USEPA 6020 Heavy Metals & USEPA 7470/71 Mercury	Oakleigh	Feb 17, 2011	6 Month

Company Name: AECOM Aust P/L Sydney
Address: Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Order No.:
Report #: 290699
Phone: (02) 8484 8999
Fax: (02) 8484 8989

Received: Feb 17, 2011 12:00
Due: Feb 24, 2011 08:56
Priority: 5 Day
Contact name: Heather Cross

Client Job No.: CALTEX WERRINGTON 60153489-200

mgt-LabMark Client Manager: Leanne Knowles

Sample Detail					**Lead (filtered)**	**Monocyclic Aromatic Hydrocarbons**	**Total Recoverable Hydrocarbons**
Laboratory where analysis is conducted							
Oakleigh Laboratory - NATA Site #1261					X	X	X
Thornleigh Laboratory - NATA Site #18217							
Asquith Laboratory - NATA Site #13535							
Clayton Laboratory - NATA Site #1645							
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
QC21	Feb 16, 2011		Water	O11-FE08021	X	X	X

mgt-LabMark Internal Quality Control Review

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis.
7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)
For samples received on the last day of holding time, notification of testing requirements should have been received at least
6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues,
suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg:milligrams per Kilogram	**mg/L:**milligrams per litre
µg/l: micrograms per litre	**ppm:** Parts per million
ppb: Parts per billion	**%:** Percentage
org/100ml: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR:	Limit Of Reporting.
SPIKE:	Addition of the analyte to the sample and reported as percentage recovery.
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery.
CRM:	Certified Reference Material - reported as percent recovery.
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE:	Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA:	U.S Environmental Protection Agency
APHA:	American Public Health Association
ASLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
COC:	Chain Of Custody
SRA:	Sample Receipt Advice

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:
Results <10 times the LOR : No Limit
Results between 10-20 times the LOR : RPD must lie between 0-50%
Results >20 times the LOR : RPD must lie between 0-20%
Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD - eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

Quality Control Results

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Method Blank							
Total Recoverable Hydrocarbons TRH C6-C36 - MGT 100A							
TRH C6-C9 Fraction by GC	mg/L	< 0.02			0.02	Pass	
TRH C10-C14 Fraction by GC	mg/L	< 0.05			0.05	Pass	
TRH C15-C28 Fraction by GC	mg/L	< 0.1			0.1	Pass	
TRH C29-C36 Fraction by GC	mg/L	< 0.1			0.1	Pass	
Method Blank							
Monocyclic Aromatic Hydrocarbons USEPA 8260B - MGT 350A							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Total m+p-Xylenes	mg/L	< 0.002			0.002	Pass	
Xylenes(ortho.meta and para)	mg/L	< 0.003			0.003	Pass	
Method Blank							
Heavy Metals USEPA 6020 Heavy Metals & USEPA 7470/71 Me							
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons TRH C6-C36 - MGT 100A		Result 1					
TRH C6-C9 Fraction by GC	%	90			70-130	Pass	
TRH C10-C14 Fraction by GC	%	98			70-130	Pass	
LCS - % Recovery							
Monocyclic Aromatic Hydrocarbons USEPA 8260B - MGT 350A		Result 1					
Benzene	%	86			75-125	Pass	
Toluene	%	95			75-125	Pass	
Ethylbenzene	%	90			75-125	Pass	
Xylenes(ortho.meta and para)	%	88			75-125	Pass	
LCS - % Recovery							
Heavy Metals USEPA 6020 Heavy Metals & USEPA 7470/71 Me		Result 1					
Lead (filtered)	%	98			80-120	Pass	
[Duplicate of 11-FE08398 - BATCH]							
Total Recoverable Hydrocarbons		Result 1	Result 2	RPD			
TRH C6-C9 Fraction by GC	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14 Fraction by GC	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28 Fraction by GC	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36 Fraction by GC	mg/L	< 0.1	< 0.1	<1	30%	Pass	
[Duplicate of 11-FE08398 - BATCH]							
Monocyclic Aromatic Hydrocarbons		Result 1	Result 2	RPD			
Benzene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
o-Xylene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Total m+p-Xylenes	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Xylenes(ortho.meta and para)	mg/L	< 0.003	< 0.003	<1	30%	Pass	
[Spike of 11-FE08021] - % Recovery							
Total Recoverable Hydrocarbons		Result 1					
TRH C6-C9 Fraction by GC	%	88			70 - 130	Pass	
TRH C10-C14 Fraction by GC	%	84			70 - 130	Pass	
[Spike of 11-FE08021] - % Recovery							
Monocyclic Aromatic Hydrocarbons		Result 1					
Benzene	%	88			75 - 125	Pass	
Toluene	%	91			75 - 125	Pass	
Ethylbenzene	%	80			75 - 125	Pass	
o-Xylene	%	80			75 - 125	Pass	
Xylenes(ortho.meta and para)	%	82			75 - 125	Pass	
[Spike of 11-FE08021] - % Recovery							
Heavy Metals		Result 1					
Lead (filtered)	%	86			70 - 130	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Michael Wright
NATA Signatory

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

* Pls forward QC21 to MGT Labmark - Melbourne *

TOLL: ANWS000423

AECOM

Chain of Custody & Analysis Request Form

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia

Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email: Heath.cross@aecom.com

Laboratory Details
Lab. Name: MGT Labmark
Lab. Address: Melbourne
Contact Name: ~~Charlie Pierce~~
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: Q0792.ES

Project Name: Caltex Werrington
Project Number: 60153489-200
Purchase Order Number:
Sample collected by: Heath Cross
Sample Results to be returned to: ~~Sam Patel~~

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle 24hr 48hr days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements ☐ Fax ☒ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A
6. Other requirements?	☐ Yes	☐ No	☐ N/A

7. Report Format:
8. Project Manager:
tel: 02-8484 8999

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix			Preservation				Container	Analysis Request			Remarks & comments
				soil	water	other	filt'ed	acid	ice	other	(No. & type)	TPH	BTEX	Pb	
	QC21	16.2.11			✓				✓		2V+1A+1P	✓	✓	✓	

* Pls forward to MGT Labmark - Melbourne *

MGT
Report #
290699

☐ Courier ☐ Postal ☐ By Hand

☐ Courier ☐ Postal ☐ By Hand

Relinquished By:		**Received by:**		**Received in good condition?** Yes/No/NA	**Method of Shipment**
Name: Dirk Sanderson	Date: 16.2.11	Name: John	Date: 17/2/11	**Samples received chilled?** Yes/No/NA	**Consignment Note No.**
of: AECOM	Time:	of: MGT	Time: 8.20am	Yes/No/NA	**Transport Co:**
Relinquished By: MGT		**Received by:**		**Received in good condition?** Yes/No/NA	**Method of Shipment**
Name: Dan Thompson	Date: 16/2/11	Name:	Date:	**Samples received chilled?** Yes/No/NA	**Consignment Note No.**
of:	Time:	of:	Time:	Yes/No/NA	**Transport Co:**

Environment

Printed copies of this document are uncontrolled

mgt LabMark
ENVIRONMENTAL LABORATORIES

ABN – 50 005 085 521 e.mail : mgt@mgtenv.com.au web : www.mgtenv.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 9564 7055
NATA Acc # 1261

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA Acc # 1645

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Sample Receipt Advice

Company name:	**AECOM Aust P/L Sydney**
Contact name:	Heather Cross
Client job number:	CALTEX WERRINGTON 60153489-200
COC number:	Not provided
Turn around time:	5 Day
Date received:	Feb 17, 2011
MGT lab reference:	**290699**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Organic samples had Teflon liners.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Leanne Knowles on Phone : +61 3 9564 7055 or by e.mail: leanne.knowles@labmark.com.au

Results will be delivered electronically via e.mail to Heather Cross - heather.cross@aecom.com.

mgt Sample Receipt

mgt LabMark
ENVIRONMENTAL LABORATORIES

Certificate of Analysis

AECOM Aust P/L Sydney
Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Attention: Heather Cross

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited
Laboratory Number 13535

The tests covered by this document have been performed in accordance with NATA and ISO/IES 17025 and are traceable to national standards of measurement.
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Report	290784-W
Client Reference	CALTEX WERRINGTON 60153489-200
Received Date	Feb 16, 2011

Client Sample ID **Sample Matrix** **mgt-LabMark Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**MW01-PRE** **Water** **11-FE31522** **Feb 16, 2011**	**MW02-PRE** **Water** **11-FE31523** **Feb 16, 2011**	**MW04-PRE** **Water** **11-FE31524** **Feb 16, 2011**	**MW01-POST** **Water** **11-FE31525** **Feb 16, 2011**
Methane	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Total Recoverable Hydrocarbons						
TRH C6-C9 Fraction by GC	0.05	mg/L	-	-	-	< 0.05
TRH C10-C14 Fraction by GC	0.05	mg/L	-	-	-	< 0.05
TRH C15-C28 Fraction by GC	0.2	mg/L	-	-	-	< 0.2
TRH C29-C36 Fraction by GC	0.05	mg/L	-	-	-	< 0.05
TRH C10-36 (Total)	0.2	mg/L	-	-	-	< 0.2
BTEX						
Benzene	0.001	mg/L	-	-	-	< 0.001
Toluene	0.001	mg/L	-	-	-	< 0.001
Ethylbenzene	0.001	mg/L	-	-	-	< 0.001
Total m+p-Xylenes	0.002	mg/L	-	-	-	< 0.002
o-Xylene	0.001	mg/L	-	-	-	< 0.001
Xylenes(ortho.meta and para)	0.003	mg/L	-	-	-	< 0.003
Total BTEX	0.01	mg/L	-	-	-	< 0.01
4-Bromofluorobenzene (surr.)	1	%	-	-	-	109
Carbon Dioxide (free)	5	mg/L	590	340	440	-
Ferric Iron - Fe3+	0.5	mg/L	0.68	0.28	1.9	-
Ferrous Iron - Fe2+	0.5	mg/L	< 0.5	< 0.5	< 0.5	-
Nitrate (as N)	0.01	mg/L	0.01	0.21	0.02	-
Sulphate (S)	2	mg/L	740	440	780	-
Total Organic Carbon	5	mg/L	13	< 5	7.3	-
Heavy Metals						
Iron (filtered)	0.05	mg/L	0.68	0.28	1.9	-
Lead (filtered)	0.001	mg/L	-	-	-	< 0.001
Manganese (filtered)	0.005	mg/L	6.5	1.1	2.2	-

Client Sample ID **Sample Matrix** **mgt-LabMark Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**MW02-POST** **Water** **11-FE31526** **Feb 16, 2011**	**MW04-POST** **Water** **11-FE31527** **Feb 16, 2011**	**QC20** **Water** **11-FE31528** **Feb 16, 2011**	**QC22** **Water** **11-FE31529** **Feb 16, 2011**
Total Recoverable Hydrocarbons						
TRH C6-C9 Fraction by GC	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C10-C14 Fraction by GC	0.05	mg/L	< 0.05	< 0.05	< 0.05	-
TRH C15-C28 Fraction by GC	0.2	mg/L	< 0.2	< 0.2	< 0.2	-
TRH C29-C36 Fraction by GC	0.05	mg/L	< 0.05	< 0.05	< 0.05	-
TRH C10-36 (Total)	0.2	mg/L	< 0.2	< 0.2	< 0.2	-
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total m+p-Xylenes	0.002	mg/L	< 0.002	0.003	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	0.001	< 0.001	< 0.001
Xylenes(ortho.meta and para)	0.003	mg/L	< 0.003	0.004	< 0.003	< 0.003
Total BTEX	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
4-Bromofluorobenzene (surr.)	1	%	103	105	105	106
Heavy Metals						
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-

Client Sample ID **Sample Matrix** **mgt-LabMark Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**QC23** **Water** **11-FE31530** **Feb 16, 2011**
Total Recoverable Hydrocarbons			
TRH C6-C9 Fraction by GC	0.05	mg/L	< 0.05
TRH C10-C14 Fraction by GC	0.05	mg/L	< 0.05
TRH C15-C28 Fraction by GC	0.2	mg/L	< 0.2
TRH C29-C36 Fraction by GC	0.05	mg/L	< 0.05
TRH C10-36 (Total)	0.2	mg/L	< 0.2
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
Total m+p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes(ortho.meta and para)	0.003	mg/L	< 0.003
Total BTEX	0.01	mg/L	< 0.01
4-Bromofluorobenzene (surr.)	1	%	105
Heavy Metals			
Lead (filtered)	0.001	mg/L	< 0.001

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description	Testing Site	Extracted	Holding Time
Methane - Method: MGT Method 136 Hydrocarbons by headspace.	Oakleigh	Feb 17, 2011	14 Day
Total Recoverable Hydrocarbons - Method: E004 Petroleum Hydrocarbons (TPH)	Asquith	Feb 17, 2011	14 Day
BTEX - Method: E029/E016 BTEX	Asquith	Feb 17, 2011	14 Day
Carbon Dioxide (free) - Method: E031 Free Carbon Dioxide	Asquith	Feb 23, 2011	1 Day
Ferric Iron - Fe3+ - Method: E044 /E058 Speciated Iron	Asquith	Feb 17, 2011	
Ferrous Iron - Fe2+ - Method: E044 /E058 Speciated Iron	Asquith	Feb 17, 2011	7 Day
Nitrate (as N) - Method: E037 /E051 Nitrate as N	Asquith	Feb 22, 2011	28 Day
Sulphate (S) - Method: E045 Sulphate	Asquith	Feb 18, 2011	28 Day
Total Organic Carbon - Method: APHA 5310B Total Organic Carbon	Oakleigh	Feb 21, 2011	28 Day
Heavy Metals - Method: USEPA 6020 Heavy Metals & USEPA 7470/71 Mercury	Oakleigh	Feb 21, 2011	6 Month

Company Name:	AECOM Aust P/L Sydney	**Order No.:**		**Received:**	Feb 16, 2011 12:00
Address:	Level 5, 828 Pacific Hwy Gordon NSW 2072	**Report #:**	290784	**Due:**	Feb 23, 2011 05:00
		Phone:	(02) 8484 8999	**Priority:**	5 Day
		Fax:	(02) 8484 8989	**Contact name:**	Heather Cross
Client Job No.:	CALTEX WERRINGTON 60153489-200				**mgt-LabMark Client Manager: Leanne Knowles**

Sample Detail					**Carbon Dioxide (free)**	**Ferric Iron - Fe3+**	**Ferrous Iron - Fe2+**	**Iron (filtered)**	**Lead (filtered)**	**Manganese (filtered)**	**Methane**	**Nitrate (as N)**	**Sulphate (S)**	**Total Organic Carbon**	**TRH C6-C9 Fraction by GC**	**Total Recoverable Hydrocarbons**	**BTEX**
Laboratory where analysis is conducted																	
Oakleigh Laboratory - NATA Site #1261								X	X	X	X			X			
Thornleigh Laboratory - NATA Site #18217																	
Asquith Laboratory - NATA Site #13535					X	X	X					X	X		X	X	X
Clayton Laboratory - NATA Site #1645																	
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
MW01-PRE	Feb 16, 2011		Water	A11-FE31522	X	X	X	X		X	X	X	X	X			
MW02-PRE	Feb 16, 2011		Water	A11-FE31523	X	X	X	X		X	X	X	X	X			
MW04-PRE	Feb 16, 2011		Water	A11-FE31524	X	X	X	X		X	X	X	X	X			
MW01-POST	Feb 16, 2011		Water	A11-FE31525					X							X	X
MW02-POST	Feb 16, 2011		Water	A11-FE31526					X							X	X
MW04-POST	Feb 16, 2011		Water	A11-FE31527					X							X	X
QC20	Feb 16, 2011		Water	A11-FE31528					X							X	X
QC22	Feb 16, 2011		Water	A11-FE31529											X		X
QC23	Feb 16, 2011		Water	A11-FE31530					X							X	X

mgt-LabMark Internal Quality Control Review

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis.
7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)
For samples received on the last day of holding time, notification of testing requirements should have been received at least
6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues,
suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg:milligrams per Kilogram
µg/l: micrograms per litre
ppb: Parts per billion
org/100ml: Organisms per 100 millilitres
mg/L:milligrams per litre
ppm: Parts per million
%: Percentage
NTU: Nephelometric Turbidity Units

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR:	Limit Of Reporting.
SPIKE:	Addition of the analyte to the sample and reported as percentage recovery.
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery.
CRM:	Certified Reference Material - reported as percent recovery.
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE:	Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA:	U.S Environmental Protection Agency
APHA:	American Public Health Association
ASLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
COC:	Chain Of Custody
SRA:	Sample Receipt Advice

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:
Results <10 times the LOR : No Limit
Results between 10-20 times the LOR : RPD must lie between 0-50%
Results >20 times the LOR : RPD must lie between 0-20%
Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD - eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

Quality Control Results

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Method Blank							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor							
TRH C10-C14 Fraction by GC	mg/L	< 0.05			0.05	Pass	
TRH C15-C28 Fraction by GC	mg/L	< 0.2			0.2	Pass	
TRH C29-C36 Fraction by GC	mg/L	< 0.05			0.05	Pass	
Method Blank							
Sulphate (S)	mg/L	< 2			2	Pass	
Method Blank							
Heavy Metals USEPA 6020 Heavy Metals & USEPA 7470/71 Me							
Iron (filtered)	mg/L	< 0.05			0.05	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Manganese (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor		Result 1					
TRH C15-C28 Fraction by GC	%	71			70-130	Pass	
LCS - % Recovery							
		Result 1					
Sulphate (S)	%	102			70-130	Pass	
LCS - % Recovery							
Heavy Metals USEPA 6020 Heavy Metals & USEPA 7470/71 Me		Result 1					
Lead (filtered)	%	103			80-120	Pass	
[Duplicate of 11-FE31522]							
		Result 1	Result 2	RPD			
Total Organic Carbon	mg/L	13	12	4	30%	Pass	
[Duplicate of 11-FE31525]							
Total Recoverable Hydrocarbons		Result 1	Result 2	RPD			
TRH C6-C9 Fraction by GC	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C10-C14 Fraction by GC	mg/L	1.2	1.3	<1	30%	Pass	
TRH C15-C28 Fraction by GC	mg/L	0.6	0.7	5.3	30%	Pass	
TRH C29-C36 Fraction by GC	mg/L	< 0.05	< 0.05	<1	30%	Pass	
[Duplicate of 11-FE31525]							
BTEX		Result 1	Result 2	RPD			
Benzene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Total m+p-Xylenes	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes(ortho.meta and para)	mg/L	< 0.003	< 0.003	<1	30%	Pass	
[Duplicate of 11-FE31525]							
Heavy Metals		Result 1	Result 2	RPD			
Iron (filtered)	mg/L	1.7	1.9	9	30%	Pass	
Lead (filtered)	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Manganese (filtered)	mg/L	1.4	1.4	3	30%	Pass	
[Spike of 11-FE31523] - % Recovery							
		Result 1					
Methane	%	110			70 - 130	Pass	
[Spike of 11-FE31526] - % Recovery							
Total Recoverable Hydrocarbons		Result 1					
TRH C6-C9 Fraction by GC	%	106			70 - 130	Pass	
TRH C15-C28 Fraction by GC	%	79			70 - 130	Pass	
[Spike of 11-FE31526] - % Recovery							
BTEX		Result 1					
Benzene	%	99			70 - 130	Pass	
Toluene	%	106			70 - 130	Pass	
Ethylbenzene	%	98			70 - 130	Pass	
Total m+p-Xylenes	%	93			70 - 130	Pass	
o-Xylene	%	98			70 - 130	Pass	
Xylenes(ortho.meta and para)	%	95			70 - 130	Pass	
[Spike of 11-FE31525] - % Recovery							
Heavy Metals		Result 1					
Lead (filtered)	%	87			70 - 130	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Authorised By

Dr. Bob Symons
NATA Signatory

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

AECOM

Chain of Custody & Analysis Request Form

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia

Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email: Heather.Cross@aecom.com

Laboratory Details
Lab. Name: MGT Labmark
Lab. Address: Sydney
Contact Name: ~~Charlie Rose~~

Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: Q0792.ES

Project Name: Caltex Werrington
Project Number: 60153489-200
Purchase Order Number:
Sample collected by: Heather Cross
Sample Results to be returned to: ~~Sam Patel~~

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr - 48hr days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements? ☐ Fax ☑ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A
6. Other requirements?	☐ Yes	☐ No	☐ N/A

7. Report Format:
8. Project Manager: tel: 02-8484 8999

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix			Preservation				Container	Analysis Request															
				soil	water	other	filled	acid	ice	other	(No. & type)	Fe 2+, Fe 3+	Mn	Dissolved CO2	Sulfate	Nitrate	Methane	TOC	TPH (C6-C36)	BTEX	Pb	TPH (C6-C9)					Remarks & comments
MW01-Pre	MW01-Pre	16.2.11			✓				✓		6V+3P	✓	✓	✓	✓	✓	✓	✓									11-FE31522
MWO	MW02-Pre	↓			✓				✓		↓	↓	↓	↓	↓	↓	↓	↓									11-FE31523
	MW04-Pre				✓				✓																		11-FE31524
	MW01-Post				✓				✓		2V+1A+1P								✓	✓	✓						11-FE31525
	MW02-Post				✓				✓		↓								↓	↓	↓						11-FE31526
	MW04-Post				✓				✓																		11-FE31527
	QC20				✓				✓																		11-FE31528
	QC22				✓				✓		2V						☐ Courier ☐ Postal ☐ By Hand										11-FE31529
	QC23	↓			✓				✓		2V+1A+1P								✓	✓	✓						11-FE31530
																	☐ Courier ☐ Postal ☐ By Hand										

Relinquished By: D.S	**Received by:** #290784		Received in good condition?	Yes/No/NA	Method of Shipment	
Name: Dirk Sanderson	Date: 16.2.11	Name:	Date:	Samples received chilled?	Yes/No/NA	Consignment Note No.
of: AECOM	Time:	of:	Time:		Yes/No/NA	Transport Co:
Relinquished By:		**Received by:**		Received in good condition?	Yes/No/NA	Method of Shipment
Name: SUE	Date: 16/2/11	Name:	Date:	Samples received chilled?	Yes/No/NA	Consignment Note No.
of: MGT Labmark.	Time: 1-55PM	of:	Time:		Yes/No/NA	Transport Co:

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