Pacific Environmental

TARGETED SOIL INVESTIGATION

KENDEL PARK
48 BURTON ROAD
MT. HUTTON, NSW

FOR

HELEN & KEN DELORCE

Prepared by:

PACIFIC ENVIRONMENTAL

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STATEMENT

This report and its contents represent the findings of a site inspection and the results of excavation of seven (7) discrete soil samples from six (6) test pits and chemical analysis testing of all those samples by a NATA Certified Laboratory. An additional five (5) pits were excavated to allow visual identification of the fill areas. In addition six (6) samples were tested for the presence of asbestos. The conclusions of the investigation are to be found in the body of this report and are dependant upon the accuracy of the laboratory analysis. The accuracy of this report and its findings are dependant upon the limitation imposed by the recommended methodology imposed by the NSW DECC. This report and its findings have been prepared and presented without influence by the client. This report has not been prepared for use in any court action and its use for such is expressly denied. Pacific Environmental accepts liability and consequential damages from any omissions up to the value of the fees paid as outlined in the relevant section of the Trade Practices Act. Pacific Environmental reserves the right to correct any omissions (if any) at its cost.

Prepared By:
STEPHEN SMITH
BSc. Eng., MEng. Sc., CPEng,
Director Pacific Environmental
13th May 2010

1.0 EXECUTIVE SUMMARY

Helen and Ken Delforce, c/o of their Architects - EJE Architecture, have engaged Pacific Environmental (PE) to investigate the potential for contamination soil conditions in the soils at Kendel Park Village, Burton Road Mount Hutton, NSW. The soils in question are those associated with the previous site usage as a horse breeding facility. The site has been uniformly filled with topsoil and compost to promote pasture growth, to a maximum depth of 400mm. The rear of the site (eastern end) has been filled between the horse exercise track and the eastern boundary. Fill soils extend to a maximum depth of 0.4m BGL in this area. The site is detailed at ***Appendix A – Site Plan***.

The assessment of the potential for contamination of the site soils was undertaken by excavating six (6) test pits at the site to the site projected maximum investigation depth – 3.0m BGL. Seven (7) discrete soil samples were taken from the six (6) test pits for NATA Certified Laboratory chemical analysis; a further six (6) samples were microscopically tested for the presence of asbestos. The location of the test pits is detailed at ***Appendix B- TEST PIT LOCATION***. An additional five (5) test pits were excavated to delineate the fill areas.

The site surface horizons are generally fill topsoil, sandy loam and clay loam mixtures (0.2- 0.4 thick) overlying natural clay soils to the excavation investigation depth of 3.0m.

Groundwater was not encountered during the intrusive investigation.

The surface fill horizon had no remnants of construction rubble.

The laboratory analysis confirmed that the natural soils encountered are suitable for residential development with unrestricted access to soils, as defined by National Environment Protection Measure Table A (NEPM). The fill soils are suitable for residential development with limited access to soils Table D (NEPM), due to the presence of minor quantities of PAH, Benzo(a)Pyrene, and lead that would exceed NEPM A criteria in the fill at the eastern end of the property. This fill, to a depth of 400mm BGL at the eastern end of the property, is capable of being removed and replaced with VENM so as to achieve a NEPM A Classification for the whole site. Alternatively this section of the site can be restricted to usage such that gardens are not made available for resident tilling. The affected site, 100m x 80m, occupying 8,000m^2, is identified as being located along the eastern boundary of the site – see – ***Appendix A – SITE PLAN***. The whole site occupies nominally 48,300830m^2.

After microscopic examination of six fill samples no asbestos fibres were noted. All excavations were examined for asbestos fragments – none were noted.

2.0 INTRODUCTION

This investigation, site visit, soils sampling (conducted on 24th April 2010) and report is to assess the site known as Kendel Park Burton Road Mount Hutton, NSW and is identified as Lots 11 and 12 and, in Deposited Plan Number 830292 . The subject area has two domestic dwellings, horse stables and an horse exercise track as well as numerous fences and internal access tracks. The rear of the property has a creek (a tributary of South Creek) running south to north across the property.

*Helen and Ken Delforce have engaged Pacific Environmental (PE) to investigate the potential f*or soil contamination that would preclude residential development at the Burton Road Site.

The site has been utilized as a horse breeding and stabling facility as well as residential occupancy since 1984.

The site has been uniformly filled with topsoil and compost to promote pasture growth, to a maximum depth of 400mm. The rear of the site (eastern end) has been filled between the horse exercise track and the eastern boundary.

The creek has a small flow in a northerly direction at the time of inspection.

No groundwater was encountered to the excavation depth of 3.0m

3.0 SITE IDENTIFICATION

The site is located at 48 Burton Road Mount Hutton, NSW and is identified as :

- Lots 11 and 12
- and
- in Deposited Plan Number 830292.

The site occupies nominally 48,300830m^2 , and is identified as being located along the eastern side of Burton Road – see ***Appendix A – SITE PLAN.***

The site is one lot north of the intersection of Gladgunsen Drive and Burton Road and is bisected at its eastern end by a tributary of South Creek. The site is currently occupied by the owners.

The site location is indicated at ***Appendix C- SITE LOCATION.***

4.0 GEOLOGY AND HYDROLOGY

The Newcastle Coalfields Regional Geology Map (1:100,000 scale) indicates that the site is underlain by Quaternary aged alluvial deposits, generally sand.

The site is relatively level with a slight fall to the east. There is a surface layer of fill comprising uniform topsoil and compost to promote pasture growth, to a maximum depth of 400mm. The rear of the site (eastern end) has been filled between the horse exercise track and the eastern boundary. Fill soils extend to a maximum depth of 0.4m BGL across the site.

The creek has a small flow in a northerly direction at the time of inspection.

No groundwater was encountered to the excavation depth of 3.0m

5.0 PREVIOUS ENVIRONMENTAL REPORTS

No known previous Environmental Site Assessment have been carried out at Kendel Park Burton Road Mount Hutton, NSW.

6.0 SITE HISTORY

An interview with the previous site owner has revealed the following history:

- the site has been utilized for horse breeding and stabling since 1994 to present;
- From 1984 to 1994 the site was utilized by former owners as horse breeding and stabling facility;
- The domestic residences were built circa 1984;
- Prior to 1984 the site was open woodland and pastures

The site has been the subject of minor filling comprising topsoil and compost across the entire area to promote the growth of pastures. The eastern end of the site (nominally 8,000$m^{2)}$ has been filled to a depth of 0.4m with clays similar to those naturally occurring on site.

7.0 EXISTING BUILDINGS & SITE FOUNDATIONS

The subject site has two domestic dwellings, horse stables and an horse exercise track as well as numerous fences and internal access tracks. The rear of the property has a creek (a tributary of South Creek) running south to north across the property..

8.0 SEWERAGE & STORMWATER DRAINAGE

The site has no formal stormwater or sewer system.

9.0 MATERIAL ON SITE

There was no construction rubble on site at the time of the inspection. The surface horizon of the site is a mixture of imported VENM topsoil and compost to promote pasture growth. There is a fill surface layer (0.4m deep) of clays compatible to the natural clay strata at the eastern end of the site occupying nominally 8,000m2. The location of this area is marked on the site plan at Appendix A.

Enquiries with the previous site owners indicate that herbicides and pesticides are not known to be used at the site.

There are no USTs on site.

10.0 SOIL SAMPLES & LABORATORY RESULTS

The soils at the site were subjected to a targeted sampling regime in accordance with requirements of the DECCW's criteria for a Stage 1 Contamination Assessment. Six (6) test holes were excavated to depths ranging from 2.6 to 3.0m BGL, with seven (7) soil samples taken for analysis from depths ranging from 0.2 to 3.0m. All these soil samples were found (after Laboratory analysis) to be suitable for Residential Development with restricted soil access compared to the National Environment Protection Measure - NEPM D. The laboratory analysis confirmed that the natural soils encountered are suitable for residential

development with unrestricted access to soils, as defined by National Environment Protection Measure Table A (NEPM). The fill soils at the eastern end of the site (test pits 1 and 2) exhibited PAH, B(a)P and lead that exceeded the NEPM A Criteria, however they meet the NEPM D Criteria. The location of the test pits is recorded at ***Appendix B- SITE TEST PIT LOCATION***. The soil samples were taken at various depths in order to comply with DECCW Guideline "Sampling Design Guidelines" – NSW EPA September 1995.

An additional six (6) samples were taken, from the fill at each excavation pit, for analysis for asbestos by a microscopic examination. No fibres were noted. All test pits were examined for asbestos fragments – none were noted.

The results of the soil-sampling test are displayed at ***Appendix E - COMPARISON OF SOIL TEST DATA WITH RELEVANT GUIDELINES.*** Soil sample results are identified in this table by Test Pit Number and the depth of sample taken BGL, eg. TP7 2.0 means sample at Test Pit 7, depth 2.0m BGL.

The samples were taken from the surface layer(the fill zone) and the underlying natural clay

A PID meter was utilized to screen duplicate samples at all test pits. All displayed PID at background levels +/-5%.

All sample were sampled from the bucket of the excavator, with a full bucket and from the middle of the soil in the bucket (for samples at depth), to avoid loss of volatile compounds. Near surface samples were taken from the wall of the excavation 0.2m into the wall, again to avoid loss of volatiles. A cleaned stainless steel push tube was utilized in both cases.

Each soil sample was taken from the excavation, immediately the excavation was undertaken. The samples for analysis, at a Certified NATA Laboratory, were immediately placed in clean laboratory prepared jars with teflon seals. The samples taken for on site analysis with a Portable Photo-ionization detector, accuracy +/- 0.1 ppm, range 0-2,000 ppm (PID) were tested immediately. The results of this field screening are shown at ***Appendix F – PID METER RESULTS.*** Each of the field screening results indicated that there were no volatile hydrocarbon emissions from the samples taken or from the excavated holes. The test pits were located as shown at ***APPENDIX – B.***

No chemical odour or discolouration was apparent from the soil samples or from the test pits.

The above soil samples were tested by the laboratory (NATA Accreditation Number 2562) as specified by the NSW DECCW in their Guidelines "Guidelines for the NSW Site Auditor Scheme – NSW DECCW 2006, Second Edition". Comparison with the following guidelines was undertaken as part of this report:

- National Environment Protection Measure (NEPM) for Residential Development with access to soil - NEPM A.
- National Environment Protection Measure (NEPM) for Residential Development with limited access to soil - NEPM D.

The NSW DECCW Service Station Guidelines were not used as no UST were present on site and no USTs have been recorded as being on site; verified by a check with NSW Work Cover Records. However for BTEX these Service Station Guidelines have been utilized as the NEPM Guidelines are silent in this aspect.

A summary of the test results is attached at ***Appendix E - COMPARISON OF SOIL TEST DATA WITH RELEVANT GUIDELINES.*** The original laboratory test results are contained at ***Appendix G – LABORATORY TEST DATA.***

The on-site testing of the headspace of duplicate samples indicated that no volatile organic hydrocarbons were present in any of the samples.

11.0 FIELD QUALITY CONTROL

The field use of the PID meter indicated that the laboratory analysis results for TRH and BTEX were at levels compatible with PID meter readings.

12.0 SAMPLING PROCEDURE

All samples at depth were taken direct from the middle of the soil pile in the excavation bucket, as it reached the measurement depth. All samples from surface layers were excavated by hand with a stainless trowel from the side wall of the excavation and 200mm into that wall to prevent loss of volatile compounds. All samples were placed in a laboratory prepared clean glass bottle with no air space after placement of the lid. Each bottle was immediately sealed with a screw cap lid incorporating a Teflon insert as a seal. All sample jars were immediately filled from the soil collected on the stainless steel trowel. All jars were filled to capacity, leaving no pockets of free space for vapors to collect in.

All samples collected at the site were assigned an individual identification number marked on the lid as well as the exterior label. Each label was marked with the Pacific Environmental name, the date as well as the name of the person taking the samples. The sample Chain of Custody Form was commenced in the field by immediately entering the sample number at the time of sampling. The site field bore logs were not undertaken at each hole, as the site soils were relatively uniform. Six (6) test holes were taken to selected depths, chosen to assess the impact of the fill on the site natural soils.

Sampling personnel used single use PVC-nitrile gloves when handling all samples. All samples were place in a 12 volt fridge at 4^0C and kept away from direct sun light or heat sources. Samples were transported to the NATA Certified laboratory directly by the sampler in the same day. No additional preservation was considered necessary. The laboratory notified this office immediately the samples were received.

The excavation bucket and sampling trowel used to excavated the test holes and obtain samples were cleaned by high pressure washing, decontamination with a 2% Decon-90 solution, followed by rinse with clean potable water, then a rinse with de-ionized water. This procedure was undertaken prior to excavating at each sample location and before each sample was obtained.

Duplicate samples, taken at the site, were placed in a clean laboratory prepared glass bottles and filled to a point leaving 30mm head space. The Photo-ionization detector was immediately used to assess the headspace of the sample for volatile organic carbons.

Each bottle was immediately sealed with a screw cap lid incorporating a Teflon inset as a seal. The samples were retested 60 minutes later to assess any difference in reading and to allow volatile

compounds to escape to the headspace. The results of the Photo-ionization detector testing are detailed at ***Appendix F - PID METER RESULTS.***

15.0 LABORATORY QA/QC

15.1 CHAIN OF CUSTODY FORMS

The COC forms were counter signed by the laboratory when the samples were delivered to the laboratory.

15.2 HOLDING TIMES

SGS Laboratories record the holding times for each method and they are all within acceptable limits.

15.3ANALYTICAL METHODS

The analytical methods utilized by the laboratory are specified at the Certificate of Analysis. The methods utilized are compatible with the requirements of the NSW DECC Guidelines for Laboratory Testing Techniques.

15.4 LABORATORY ACCREDITATION

The laboratory utilized is NATA Certified, number 2562 (4354). Similarly the laboratory is accredited for each of the metrologies used, as detailed in their Certificate of Analysis.

15.5 LABORATORY PERFORMANCE

Pacific Environmental batches duplicate samples to an alternative laboratory on a bi-annual basis to ensure quality control between laboratories. Pacific Environmental also rotates the main laboratory with the duplicate sample laboratory to also check consistency. Since October 2003 the laboratories utilized have been Labmark (formerly)Amdel Laboratories and SGS laboratories Botany. Both laboratories have shown consistency within acceptable limits (70 –130%)%), except when sample test results are at or close to the limits of detection. This minor inconstancy is not considered significant.

15.6 SURROGATES, DUPLICATES AND SPIKES/PERCENT RECOVERIES

The recorded data is attached at ***Appendix H – SURROGATE & SPIKE QA/QC.*** All recorded data is within acceptable limits.

15.7 METHOD/INSTRUMENT & LIMITS OF RECOVERY

The method/instrument and Limits of Recovery are recorded on the QA/QC sheets for each analyte. These limits are well below the levels of concern recorded in the relevant Guidelines.

16.0 RECOMMENDATIONS & CONCLUSION

A summary of the laboratory test results is attached at ***Appendix E - COMPARISON OF SOIL TEST DATA WITH RELEVANT GUIDELINES.***

THE CONCLUSIONS THAT CAN BE DRAWN FROM THE LABORATORY RESULTS ARE:

- The area nominated as the 8,000m^2 area at the eastern end of the site has found that the fill soils (to 0.4m BGL) meet the NEPM D Criteria (residential development with limited access to the soils), but not the NEPM A Criteria (residential development with unrestricted access to soils);

- There is no identified asbestos in the fill at the site.

The recommended remediation of the site is:

RECOMMENDATION

1. The fill soils at the eastern end of the site (8,000m^2), that are to remain exposed after development, be restricted as to their use to prevent domestic access to soils being used for the production of home grown produce;

   or

2. The fill soils at the eastern end of the site (8,000m^2), that would remain exposed after development, be removed to a depth of 0.4m and be replaced with for clean VENM.

APPENDIX A – SITE PLAN

NOTES :

1. FEATURES SHOWN TO SCALE ACCURACY.
2. THIS PLAN IS SUITABLE FOR DETAILED PLANNING AND DESIGN AT THE SCALE/S STATED. THE PLAN MAY NOT BE SUITABLE FOR ANY OTHER PURPOSE OR FOR USE AT ANY OTHER SCALE/S.
3. SERVICES LOCATED ONLY WHERE VISIBLE.
4. THE LOCATION OF ALL UNDERGROUND SERVICES WHETHER SHOWN ON THE PLAN OR NOT, SHOULD BE PRECISELY DETERMINED BEFORE ANY CONSTRUCTION WORK COMMENCES AND MEASURES TAKEN TO PROTECT THESE SERVICES FROM DAMAGE.
5. CONTOUR INTERVAL - 0.5m
6. THE BOUNDARIES SHOWN ARE APPROXIMATE ONLY. THE BOUNDARIES SHOWN HAVE BEEN COMPILED FROM THE RELEVANT DEPOSITED PLANS OBTAINED FROM THE LPMA. FURTHER SURVEY WILL BE REQUIRED IF CONSTRUCTION IS TO TAKE PLACE ON OR ADJACENT TO THE BOUNDARIES.

LEGEND

- DENOTES TREE (SEE TABLE FOR TREE DETAILS)
- SV STOP VALVE
- HYD HYDRANT
- W/M WATER METER
- TAP WATER TAP
- PP POWER POLE
- TEL TELSTRA PIT
- PIT DRAINAGE PIT
- DRAINAGE LINE / CREEK
- FENCE LINE
- MINOR CONTOUR LINE
- 10 MAJOR CONTOUR LINE
- BOUNDARY LINE
- TOP & TOE OF BANKS
- ADJACENT BOUNDARY
- ROAD / LANE MARKINGS

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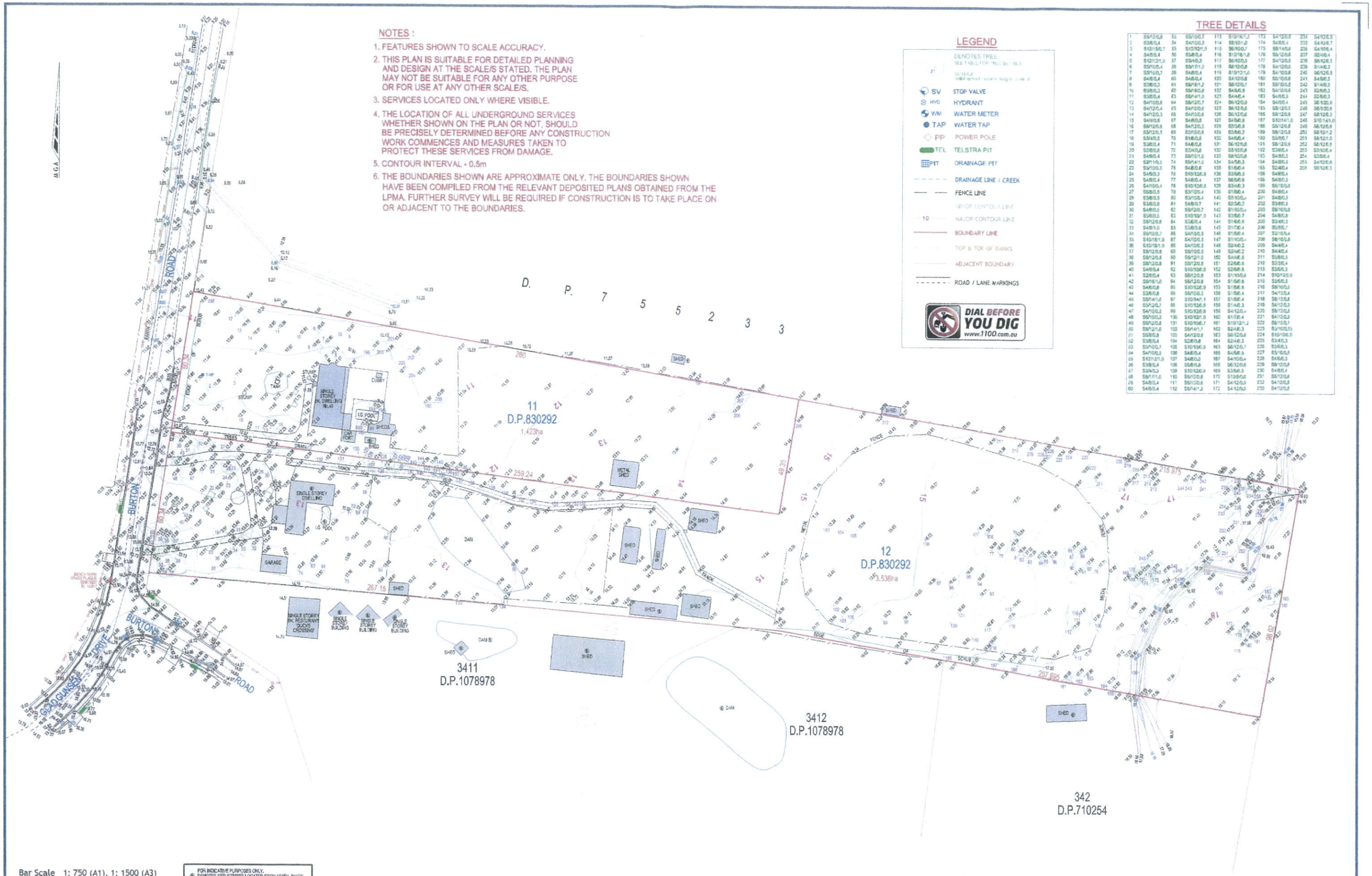
TREE DETAILS

1	S6/12/0.8	53	S6/10/0.7	113	S10/16/1.3	173	S4/12/0.5	234	S4/12/0.5
2	S3/6/0.4	54	S4/10/0.5	114	S8/12/1.0	174	S4/8/0.4	235	S4/12/0.7
3	S12/15/0.7	55	S12/18/1.0	115	S6/10/0.7	175	S8/14/0.8	236	S4/10/0.4
4	S4/8/0.4	56	S3/6/0.4	116	S12/16/1.0	176	S8/12/0.6	237	S2/4/0.4
5	S12/12/1.0	57	S3/4/0.3	117	S6/10/0.5	177	S4/12/0.5	238	S6/12/0.5
6	S5/10/0.4	58	S6/12/1.0	118	S8/12/0.8	178	S4/12/0.5	239	S1/4/0.3
7	S5/10/0.7	59	S4/8/0.4	119	S10/12/1.0	179	S4/10/0.6	240	S6/12/0.5
8	S4/8/0.4	60	S4/6/0.4	120	S4/12/0.8	180	S5/10/0.6	241	S4/6/0.3
9	S2/6/0.3	61	S8/16/1.2	121	S8/12/0.7	181	S8/10/0.5	242	S1/4/0.3
10	S3/6/0.3	62	S6/8/0.6	122	S4/6/0.5	182	S4/10/0.6	243	S2/6/0.3
11	S3/6/0.4	63	S6/14/1.0	123	S4/4/0.4	183	S4/6/0.5	244	S2/6/0.3
12	S4/10/0.5	64	S8/12/0.7	124	S6/12/0.8	184	S4/6/0.4	245	S6/12/0.6
13	S4/12/0.4	65	S4/10/0.6	125	S6/12/0.6	185	S8/12/0.5	246	S6/12/0.8
14	S4/12/0.3	66	S4/10/0.6	126	S6/12/0.6	186	S8/12/0.8	247	S8/12/0.5
15	S4/4/0.2	67	S4/8/0.5	127	S4/6/0.6	187	S10/14/1.0	248	S10/14/1.0
16	S6/12/0.6	68	S4/12/0.5	128	S5/10/0.6	188	S8/12/0.8	249	S6/12/0.6
17	S5/12/0.5	69	S2/10/0.6	129	S5/8/0.7	189	S8/12/0.8	250	S8/12/1.2
18	S5/4/0.5	70	S1/6/0.6	130	S4/6/0.4	190	S5/8/0.7	251	S8/12/1.0
19	S3/6/0.4	71	S4/6/0.6	131	S6/12/0.6	191	S8/12/0.6	252	S8/12/0.5
20	S2/6/0.6	72	S2/4/0.6	132	S5/10/0.6	192	S3/6/0.4	253	S3/10/0.4
21	S4/8/0.4	73	S5/10/1.0	133	S8/10/0.6	193	S4/8/0.3	254	S3/6/0.4
22	S2/110.5	74	S8/14/1.0	134	S4/5/0.3	194	S4/8/0.5	255	S4/12/0.6
23	S3/10/0.5	75	S4/6/0.6	135	S1/6/0.4	195	S2/4/0.4	256	S6/12/0.5
24	S4/6/0.3	76	S10/12/0.8	136	S3/6/0.3	196	S4/6/0.4		
25	S4/6/0.4	77	S4/8/0.4	137	S6/6/0.6	197	S4/8/0.3		
26	S4/10/0.4	78	S10/12/0.8	138	S3/4/0.3	198	S5/10/0.5		
27	S5/8/0.5	79	S3/12/0.4	139	S1/6/0.4	199	S4/8/0.4		
28	S3/6/0.5	80	S3/10/0.4	140	S5/10/0.4	201	S4/6/0.5		
29	S3/6/0.8	81	S4/6/0.7	141	S2/3/0.2	202	S3/6/0.3		
30	S4/6/0.5	82	S8/12/0.7	142	S1/10/0.4	203	S8/10/0.9		
31	S3/6/0.5	83	S10/13/1.0	143	S3/6/0.7	204	S4/8/0.8		
32	S6/12/0.8	84	S3/6/0.4	144	S1/6/0.6	205	S3/4/0.3		
33	S4/8/1.0	85	S3/8/0.6	145	S1/7/0.4	206	S5/6/0.7		
34	S6/10/0.7	86	S4/10/0.5	146	S1/6/0.4	207	S2/10/0.4		
35	S10/18/1.3	87	S4/10/0.5	147	S1/10/0.4	208	S8/10/0.8		
36	S10/18/1.0	88	S4/10/0.3	148	S2/4/0.2	209	S4/4/0.4		
37	S8/12/0.8	89	S8/15/0.5	149	S2/4/0.2	210	S4/4/0.4		
38	S8/12/0.8	90	S8/12/1.0	150	S4/4/0.3	211	S3/6/0.3		
39	S8/12/0.8	91	S8/12/0.8	151	S2/6/0.5	212	S2/3/0.4		
40	S4/6/0.4	92	S10/12/0.5	152	S2/6/0.5	213	S3/6/0.3		
41	S2/6/0.4	93	S8/12/0.8	153	S1/10/0.6	214	S10/12/0.6		
42	S8/16/1.0	94	S8/12/0.8	154	S1/6/0.6	215	S3/6/0.3		
43	S4/6/0.6	95	S10/12/0.9	155	S1/6/0.6	216	S8/10/0.5		
44	S3/6/0.8	96	S8/10/0.3	156	S1/6/0.4	217	S4/12/0.4		
45	S8/14/1.0	97	S10/14/1.1	157	S1/6/0.4	218	S8/12/0.8		
46	S3/12/0.7	98	S10/12/0.8	158	S1/4/0.3	219	S4/12/0.3		
47	S4/10/0.5	99	S10/12/0.8	159	S4/12/0.4	220	S8/12/0.5		
48	S6/16/0.3	100	S10/12/1.0	160	S1/7/0.4	221	S4/12/0.5		
49	S8/12/0.8	101	S10/13/0.7	161	S10/12/1.2	222	S8/12/0.7		
50	S8/12/1.0	102	S8/14/1.1	162	S2/4/0.3	223	S1/10/0.33		
51	S8/12/0.8	103	S4/12/0.8	163	S6/12/0.6	224	S10/16/0.5		
52	S3/6/0.4	104	S2/6/0.8	164	S2/4/0.3	225	S3/4/0.3		
53	S3/10/0.7	105	S10/13/0.9	165	S6/12/0.7	226	S3/6/0.3		
54	S4/10/0.5	106	S4/6/0.4	166	S4/8/0.3	227	S3/10/0.5		
55	S12/12/1.0	107	S4/8/0.5	167	S4/10/0.4	228	S4/6/0.3		
56	S3/6/0.4	108	S8/8/0.8	168	S6/12/0.6	229	S8/12/0.8		
57	S3/4/0.3	109	S10/12/0.9	169	S3/6/0.3	230	S4/6/0.4		
58	S8/11/1.0	110	S6/10/0.8	170	S10/6/0.6	231	S8/12/0.6		
59	S4/8/0.4	111	S6/10/0.6	171	S4/12/0.5	232	S4/12/0.5		
60	S4/6/0.4	112	S8/14/1.2	172	S4/12/0.5	233	S4/12/0.6		



Bar Scale 1: 750 (A1), 1: 1500 (A3)

0 10 20 30 40 50

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⊕ DENOTES STRUCTURES LOCATED FROM AERIAL IMAGE. STRUCTURE LOCATION APPROXIMATE ONLY.

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TITLE

DETAIL & CONTOUR SURVEY

LOTS 11 & 12 D.P.830292

LGA LAKE MACQUARIE

Ed.	Date	Amendment
H		
G		
F		
E		
D		
C	14.04.10	INITIAL ISSUE
B	09.04.10	ISSUE B
A	07.04.10	PRELIM. ISSUE

JOB ADDRESS: BURTON ROAD, MOUNT HUTTON
CLIENT: KEN DELFORCE
PLAN No 1
JOB REF: 910
SCALE: A1 1:750 A3 1:1500
SURVEY DATE: MARCH/APRIL 2010
PLAN DATE: 14.04.10
DATUM: AHD
CAD REF: 910DET-BDY
ORIGIN OF LEVELS SSM79207 RL14.017
DRAWN MH
SURVEYOR DL
CHECKED DL/WS
APPROVED WS
SHEET No 1/1
DRAWING REF: 910-DET-14.04.10

APPENDIX B- TEST PIT LOCATION

NOTES

1. FEATURES SHOWN TO SCALE ACCURACY
2. THIS PLAN IS SUITABLE FOR DETAILED PLANNING AND DESIGN AT THE SCALE/S STATED. THE PLAN MAY NOT BE SUITABLE FOR ANY OTHER PURPOSE OR FOR USE AT ANY OTHER SCALE/S.
3. SERVICES LOCATED ONLY WHERE VISIBLE
4. THE LOCATION OF ALL UNDERGROUND SERVICES WHETHER SHOWN ON THE PLAN OR NOT, SHOULD BE PRECISELY DETERMINED BEFORE ANY CONSTRUCTION WORK COMMENCES AND MEASURES TAKEN TO PROTECT THESE SERVICES FROM DAMAGE
5. CONTOUR INTERVAL - 0.5m
6. THE BOUNDARIES SHOWN ARE APPROXIMATE ONLY. THE BOUNDARIES SHOWN HAVE BEEN COMPILED FROM THE RELEVANT DEPOSITED PLANS OBTAINED FROM THE LPMA. FURTHER SURVEY WILL BE REQUIRED IF CONSTRUCTION IS TO TAKE PLACE ON OR ADJACENT TO THE BOUNDARIES.

LEGEND

DIAL BEFORE YOU DIG www.1100.com.au

TREE DETAILS

B6

B4

B5

B3

B2

B1

11 D.P.830292

12 D.P.830292

3411 D.P.1078978

3412 D.P.1078978

D P 7 5 5 2 3 3

BURTON ROAD

BURTONS LANE

BOLGUNNIA DRIVE

Fill Area complying with NEPM D only

PACIFIC ENVIRONMENTAL

Location of Test Pits

● Test Pits B1 – B6

Bar Scale 1: 750 (A1), 1: 1500 (A3)

0 10 20 30 40 50

FOR INDICATIVE PURPOSES ONLY. SHADED STRUCTURES LOCATED FROM AERIAL IMAGE. STRUCTURE LOCATION APPROXIMATE ONLY.

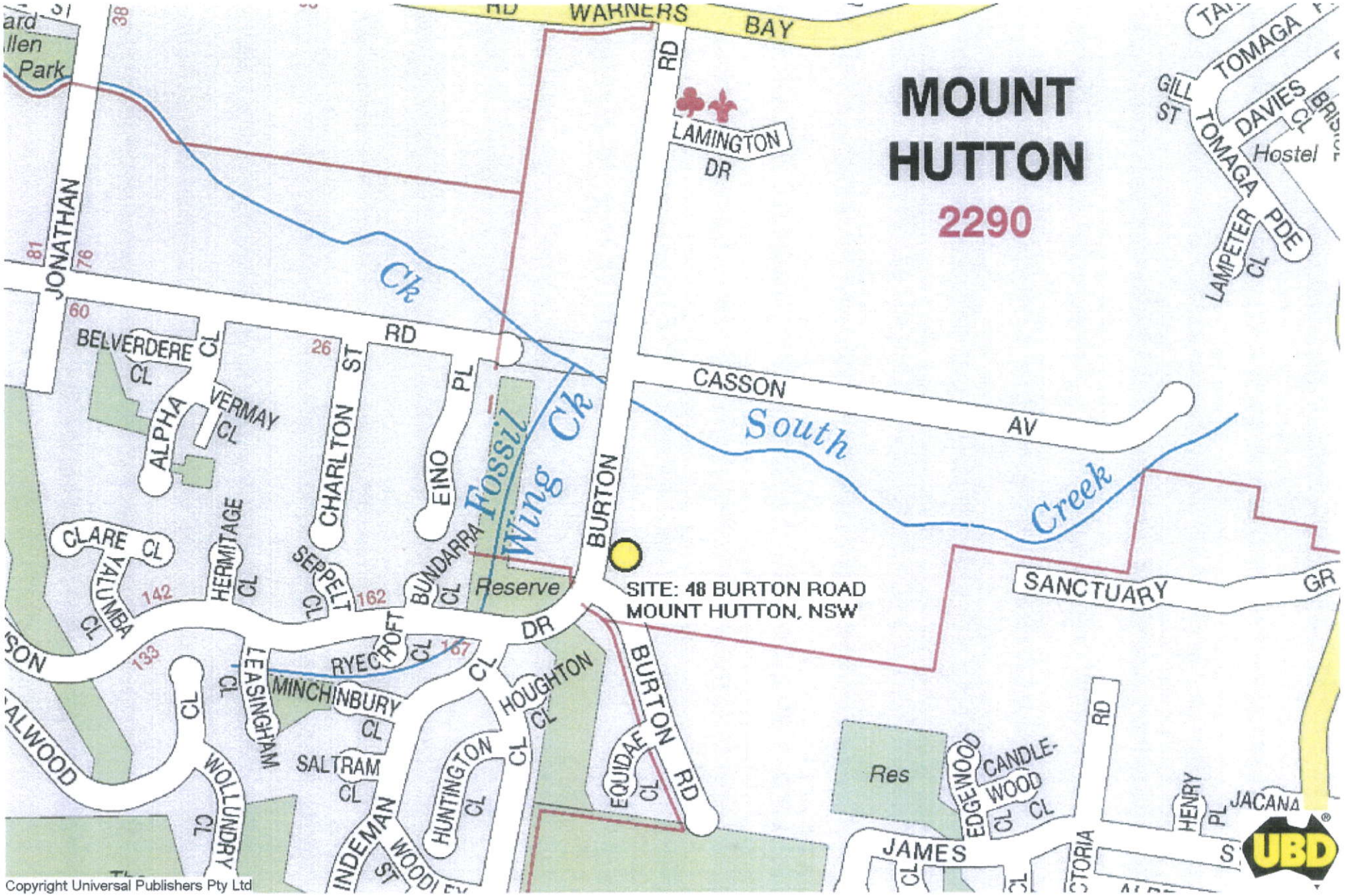
de Witt Consulting
planning ■ surveying ■ project management
7 Carrow la Street Charlestown NSW 2290 | PO Box 552 Charlestown NSW 2290
P 02 4942 5441 | F 02 4942 5301
ABN 20 104 087 405

TITLE: DETAIL & CONTOUR SURVEY
LOTS 11 & 12 D.P.830292
LGA LAKE MACQUARIE

14.04.10	INITIAL ISSUE	
09.04.10	ISSUE B	
07.04.10	PRELIM ISSUE	

JOB ADDRESS: BURTON ROAD, MOUNT HUTTON
CLIENT: KEN DELFORCE
PLAN No: 1
JOB REF: 910
SCALE: A1 1:750 A3 1:1500
SURVEY DATE: MARCH/APRIL 2010
PLAN DATE: 14.04.10
DATUM: AHD
CAD REF: 910DET-B0y
ORIGIN OF LEVELS: SSM79207 RL 14.017
DRAWN: MH
SURVEYOR: DL
CHECKED: DLWS
APPROVED: WS
SHEET No: 1/1
DRAWING REF: 910-DET-14.04.10

APPENDIX C – SITE LOCATION



APPENDIX D – LABORATORY ANALYSIS

ANALYTICAL REPORT

30 April 2010

Pacific Environmental Pty Ltd
PO Box 4045
Illawong
NSW 2234

Attention: **Stephen Smith**

Your Reference: MA

Our Reference: SE77631

Samples: 7 Soils
Received: 22/4/10

These samples were analysed in accordance with your written instructions.

For and on Behalf of
SGS ENVIRONMENTAL SERVICES

Sample Receipt:	Angela Mamalicos	AU.SampleReceipt.Sydney@sgs.com
Production Manager	Huong Crawford	Huong.Crawford@sgs.com

Results Approved and/or Authorised by:

Edward Ibrahim
Laboratory Manager

Dong Liang
Quality Manager

Ly Kim Ha
Organics Signatory

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WORLD RECOGNISED ACCREDITATION

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BTEX in Soil	UNITS					
Our Reference	----------	SE77631-1	SE77631-1	SE77631-1	SE77631-1	SE77631-1
Your Reference	----------	B1 0.3	B1 0.6	B2 1.9	B3 1.2	B4 2.5
Sample Matrix		Soil	Soil	Soil	Soil	Soil
Date Sampled		21/4/2010	21/4/2010	21/4/2010	21/4/2010	21/4/2010
Time Sample Taken		11.00	11.15	11.30	12.30	12.50
Date Extracted (BTEX)		27/04/2010	27/04/2010	27/04/2010	27/04/2010	27/04/2010
Date Analysed (BTEX)		27/04/2010	27/04/2010	27/04/2010	27/04/2010	27/04/2010
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
BTEX Surrogate (%)	%	86	78	82	84	99

BTEX in Soil	UNITS		
Our Reference	----------	SE77631-1	SE77631-1
Your Reference		B5 0.2	B6 0.3
Sample Matrix		Soil	Soil
Date Sampled		21/4/2010	21/4/2010
Time Sample Taken		2.00	2.30
Date Extracted (BTEX)		27/04/2010	27/04/2010
Date Analysed (BTEX)		27/04/2010	27/04/2010
Benzene	mg/kg	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1
Total Xylenes	mg/kg	<0.3	<0.3
BTEX Surrogate (%)	%	69	70

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TRH in soil with..C6-C9 by P/T Our Reference Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS	SE77631-1 B1 0.3 Soil 21/4/2010 11.00	SE77631-1 B1 0.6 Soil 21/4/2010 11.15	SE77631-1 B2 1.9 Soil 21/4/2010 11.30	SE77631-1 B3 1.2 Soil 21/4/2010 12.30	SE77631-1 B4 2.5 Soil 21/4/2010 12.50
Date Extracted (TRH C6-C9 PT)		27/04/2010	27/04/2010	27/04/2010	27/04/2010	27/04/2010
Date Analysed (TRH C6-C9 PT)		27/04/2010	27/04/2010	27/04/2010	27/04/2010	27/04/2010
TRH C6 - C9 P&T	mg/kg	<20	<20	<20	<20	<20
Date Extracted (TRH C10-C36)		27/04/2010	27/04/2010	27/04/2010	27/04/2010	27/04/2010
Date Analysed (TRH C10-C36)		27/04/2010	27/04/2010	27/04/2010	27/04/2010	27/04/2010
TRH C10 - C14	mg/kg	<20	<20	<20	<20	<20
TRH C15 - C28	mg/kg	130	180	65	<50	<50
TRH C29 - C36	mg/kg	130	200	<50	<50	<50

TRH in soil with..C6-C9 by P/T Our Reference Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS	SE77631-1 B5 0.2 Soil 21/4/2010 2.00	SE77631-1 B6 0.3 Soil 21/4/2010 2.30
Date Extracted (TRH C6-C9 PT)		27/04/2010	27/04/2010
Date Analysed (TRH C6-C9 PT)		27/04/2010	27/04/2010
TRH C6 - C9 P&T	mg/kg	<20	<20
Date Extracted (TRH C10-C36)		27/04/2010	27/04/2010
Date Analysed (TRH C10-C36)		27/04/2010	27/04/2010
TRH C10 - C14	mg/kg	<20	<20
TRH C15 - C28	mg/kg	350	480
TRH C29 - C36	mg/kg	240	280

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PAHs in Soil Our Reference Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS	SE77631-1 B1 0.3 Soil 21/4/2010 11.00	SE77631-1 B1 0.6 Soil 21/4/2010 11.15	SE77631-1 B2 1.9 Soil 21/4/2010 11.30	SE77631-1 B3 1.2 Soil 21/4/2010 12.30	SE77631-1 B4 2.5 Soil 21/4/2010 12.50
Date Extracted		27/04/2010	27/04/2010	27/04/2010	27/04/2010	27/04/2010
Date Analysed		27/04/2010	27/04/2010	27/04/2010	27/04/2010	27/04/2010
Naphthalene	mg/kg	0.26	0.21	<0.10	<0.10	<0.10
2-Methylnaphthalene	mg/kg	0.31	0.24	<0.10	<0.10	<0.10
1-Methylnaphthalene	mg/kg	0.19	0.15	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	0.20	0.20	0.14	<0.10	<0.10
Acenaphthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	<0.10	0.11	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	0.58	1.7	1.4	0.78	0.15
Anthracene	mg/kg	0.27	0.41	0.36	0.24	<0.10
Fluoranthene	mg/kg	3.5	2.9	2.5	2.2	0.25
Pyrene	mg/kg	4.4	3.1	2.8	2.5	0.25
Benzo[a]anthracene	mg/kg	2.5	1.5	1.4	1.3	0.20
Chrysene	mg/kg	2.3	1.3	1.1	1.3	0.13
Benzo[b,k]fluoranthene	mg/kg	3.8	2.2	2.0	1.8	<0.20
Benzo[a]pyrene	mg/kg	2.6	1.3	1.2	1.1	0.10
Indeno[123-cd]pyrene	mg/kg	1.3	0.66	0.60	0.55	<0.10
Dibenzo[ah]anthracene	mg/kg	0.22	0.12	0.11	0.10	<0.10
Benzo[ghi]perylene	mg/kg	0.94	0.47	0.43	0.38	<0.10
Total PAHs (sum)	mg/kg	<23.74	<16.72	<14.74	<12.83	<2.28
Nitrobenzene-d5	%	93	89	82	85	79
2-Fluorobiphenyl	%	88	86	82	85	87
p -Terphenyl- d 14	%	91	85	94	93	95

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PAHs in Soil Our Reference Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE77631-1 B5 0.2 Soil 21/4/2010 2.00	SE77631-1 B6 0.3 Soil 21/4/2010 2.30
Date Extracted		27/04/2010	27/04/2010
Date Analysed		27/04/2010	27/04/2010
Naphthalene	mg/kg	<0.10	0.22
2-Methylnaphthalene	mg/kg	<0.10	0.17
1-Methylnaphthalene	mg/kg	<0.10	0.14
Acenaphthylene	mg/kg	<0.10	0.16
Acenaphthene	mg/kg	<0.10	0.33
Fluorene	mg/kg	<0.10	0.86
Phenanthrene	mg/kg	0.68	4.7
Anthracene	mg/kg	0.13	1.0
Fluoranthene	mg/kg	0.86	13
Pyrene	mg/kg	0.98	11
Benzo[a]anthracene	mg/kg	0.49	5.2
Chrysene	mg/kg	0.49	5.2
Benzo[b,k]fluoranthene	mg/kg	0.62	7.2
Benzo[a]pyrene	mg/kg	0.35	3.8
Indeno[123-cd]pyrene	mg/kg	0.16	2.0
Dibenzo[ah]anthracene	mg/kg	<0.10	0.38
Benzo[ghi]perylene	mg/kg	0.13	1.5
Total PAHs (sum)	mg/kg	<5.57	57
Nitrobenzene-d5	%	75	89
2-Fluorobiphenyl	%	77	86
p -Terphenyl- *d* 14	%	68	81

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OC Pesticides in Soil Our Reference Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE77631-1 B1 0.3 Soil 21/4/2010 11.00	SE77631-1 B1 0.6 Soil 21/4/2010 11.15	SE77631-1 B2 1.9 Soil 21/4/2010 11.30	SE77631-1 B3 1.2 Soil 21/4/2010 12.30	SE77631-1 B4 2.5 Soil 21/4/2010 12.50
Date Extracted		28/04/2010	28/04/2010	28/04/2010	28/04/2010	28/04/2010
Date Analysed		28/04/2010	28/04/2010	28/04/2010	28/04/2010	28/04/2010
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC (Lindane)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
cis-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5,6-Tetrachloro-m-xylene (*Surrogate*	%	121	121	128	113	115

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OC Pesticides in Soil Our Reference Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE77631-1 B5 0.2 Soil 21/4/2010 2.00	SE77631-1 B6 0.3 Soil 21/4/2010 2.30
Date Extracted		28/04/2010	28/04/2010
Date Analysed		28/04/2010	28/04/2010
HCB	mg/kg	<0.1	<1.0
alpha-BHC	mg/kg	<0.1	<1.0
gamma-BHC (Lindane)	mg/kg	<0.1	<1.0
Heptachlor	mg/kg	<0.1	<1.0
Aldrin	mg/kg	<0.1	<1.0
beta-BHC	mg/kg	<0.1	<1.0
delta-BHC	mg/kg	<0.1	<1.0
Heptachlor Epoxide	mg/kg	<0.1	<1.0
o,p-DDE	mg/kg	<0.1	<1.0
alpha-Endosulfan	mg/kg	<0.1	<1.0
trans-Chlordane	mg/kg	<0.1	<1.0
cis-Chlordane	mg/kg	<0.1	<1.0
trans-Nonachlor	mg/kg	<0.1	<1.0
p,p-DDE	mg/kg	<0.1	<1.0
Dieldrin	mg/kg	<0.1	<1.0
Endrin	mg/kg	<0.1	<1.0
o,p-DDD	mg/kg	<0.1	<1.0
o,p-DDT	mg/kg	<0.1	<1.0
beta-Endosulfan	mg/kg	<0.1	<1.0
p,p-DDD	mg/kg	<0.1	<1.0
p,p-DDT	mg/kg	<0.1	<1.0
Endosulfan Sulphate	mg/kg	<0.1	<1.0
Endrin Aldehyde	mg/kg	<0.1	<1.0
Methoxychlor	mg/kg	<0.1	<1.0
Endrin Ketone	mg/kg	<0.1	<1.0
2,4,5,6-Tetrachloro-m-xylene (Surrogate	%	119	127

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OP Pesticides in Soil by GCMS Our Reference Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS	SE77631-1 B1 0.3 Soil 21/4/2010 11.00	SE77631-1 B1 0.6 Soil 21/4/2010 11.15	SE77631-1 B2 1.9 Soil 21/4/2010 11.30	SE77631-1 B3 1.2 Soil 21/4/2010 12.30	SE77631-1 B4 2.5 Soil 21/4/2010 12.50
Date Extracted		27/04/2010	27/04/2010	27/04/2010	27/04/2010	27/04/2010
Date Analysed		27/04/2010	27/04/2010	27/04/2010	27/04/2010	27/04/2010
Dichlorvos	mg/kg	<1	<1	<1	<1	<1
Dimethoate	mg/kg	<1	<1	<1	<1	<1
Diazinon	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorpyrifos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Bromofos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
2-fluorobiphenyl (Surr)	%	93	90	86	87	87
d14-p-Terphenyl (Surr)	%	91	85	94	93	95

OP Pesticides in Soil by GCMS Our Reference Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS	SE77631-1 B5 0.2 Soil 21/4/2010 2.00	SE77631-1 B6 0.3 Soil 21/4/2010 2.30
Date Extracted		27/04/2010	27/04/2010
Date Analysed		27/04/2010	27/04/2010
Dichlorvos	mg/kg	<1	<1
Dimethoate	mg/kg	<1	<1
Diazinon	mg/kg	<0.5	<0.5
Fenitrothion	mg/kg	<0.2	<0.2
Malathion	mg/kg	<0.20	<0.20
Chlorpyrifos-ethyl	mg/kg	<0.2	<0.2
Parathion-ethyl	mg/kg	<0.2	<0.2
Bromofos-ethyl	mg/kg	<0.2	<0.2
Methidathion	mg/kg	<0.5	<0.5
Ethion	mg/kg	<0.2	<0.2
Azinphos-methyl	mg/kg	<0.20	<0.20
2-fluorobiphenyl (Surr)	%	81	91
d14-p-Terphenyl (Surr)	%	68	81

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Inorganics Our Reference Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS	SE77631-1 B1 0.3 Soil 21/4/2010 11.00	SE77631-1 B1 0.6 Soil 21/4/2010 11.15	SE77631-1 B2 1.9 Soil 21/4/2010 11.30	SE77631-1 B3 1.2 Soil 21/4/2010 12.30	SE77631 1 B4 2.5 Soil 21/4/2010 12.50
Date Extracted- (pH 1.5 soil: Water)		29/04/2010	29/04/2010	29/04/2010	29/04/2010	29/04/2010
Date Analysed (pH 1.5 Soil: Water)		29/04/2010	29/04/2010	29/04/2010	29/04/2010	29/04/2010
pH 1.5 soil:water	pH Units	8.7	8.0	8.0	6.5	6.9

Inorganics Our Reference Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS	SE77631-1 B5 0.2 Soil 21/4/2010 2.00	SE77631 1 B6 0.3 Soil 21/4/2010 2.30
Date Extracted- (pH 1.5 soil: Water)		29/04/2010	29/04/2010
Date Analysed (pH 1.5 Soil: Water)		29/04/2010	29/04/2010
pH 1.5 soil:water	pH Units	7.9	8.8

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Metals in Soil by ICP-OES	UNITS	SE77631-1	SE77631-1	SE77631-1	SE77631-1	SE77631-1
Our Reference		B1 0.3	B1 0.6	B2 1.9	B3 1.2	B4 2.5
Your Reference	----------	Soil	Soil	Soil	Soil	Soil
Sample Matrix	----------	21/4/2010	21/4/2010	21/4/2010	21/4/2010	21/4/2010
Date Sampled		11 00	11.15	11.30	12.30	12.50
Time Sample Taken						
Date Extracted (Metals)		28/04/2010	28/04/2010	28/04/2010	28/04/2010	28/04/2010
Date Analysed (Metals)		28/04/2010	28/04/2010	28/04/2010	28/04/2010	28/04/2010
Arsenic	mg/kg	4	5	16	3	<3
Cadmium	mg/kg	0.3	1 7	1 9	<0.3	<0.3
Chromium	mg/kg	22	17	27	4.0	2.0
Copper	mg/kg	38	77	320	26	9.4
Lead	mg/kg	86	230	890	48	17
Nickel	mg/kg	26	20	18	2.7	0.7
Zinc	mg/kg	95	170	600	89	13

Metals in Soil by ICP-OES	UNITS	SE77631-1	SE77631-1
Our Reference		B5 0.2	B6 0 3
Your Reference	----------	Soil	Soil
Sample Matrix		21/4/2010	21/4/2010
Date Sampled		2.00	2 30
Time Sample Taken			
Date Extracted (Metals)		28/04/2010	28/04/2010
Date Analysed (Metals)		28/04/2010	28/04/2010
Arsenic	mg/kg	14	11
Cadmium	mg/kg	1 2	1.0
Chromium	mg/kg	33	23
Copper	mg/kg	180	470
Lead	mg/kg	170	460
Nickel	mg/kg	19	19
Zinc	mg/kg	190	310

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Mercury Cold Vapor/Hg Analyser Our Reference Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ..... ----------	SE77631-1 B1 0.3 Soil 21/4/2010 11.00	SE77631-1 B1 0.6 Soil 21/4/2010 11.15	SE77631-1 B2 1.9 Soil 21/4/2010 11.30	SE77631-1 B3 1.2 Soil 21/4/2010 12.30	SE77631-1 B4 2.5 Soil 21/4/2010 12.50
Date Extracted (Mercury)		28/04/2010	28/04/2010	28/04/2010	28/04/2010	28/04/2010
Date Analysed (Mercury)		28/04/2010	28/04/2010	28/04/2010	28/04/2010	28/04/2010
Mercury	mg/kg	0.20	0.75	1.2	0.09	<0.05

Mercury Cold Vapor/Hg Analyser Our Reference Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ----------	SE77631-1 B5 0.2 Soil 21/4/2010 2.00	SE77631-1 B6 0.3 Soil 21/4/2010 2.30
Date Extracted (Mercury)		28/04/2010	28/04/2010
Date Analysed (Mercury)		28/04/2010	28/04/2010
Mercury	mg/kg	0.19	0.48

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Moisture Our Reference Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ---------- ----------	SE77631-1 B1 0.3 Soil 21/4/2010 11.00	SE77631-1 B1 0.6 Soil 21/4/2010 11.15	SE77631-1 B2 1.9 Soil 21/4/2010 11.30	SE77631-1 B3 1.2 Soil 21/4/2010 12.30	SE77631-1 B4 2.5 Soil 21/4/2010 12.50
Date Analysed (moisture)		27/04/2010	27/04/2010	27/04/2010	27/04/2010	27/04/2010
Moisture	%	13	10	21	4	5

Moisture Our Reference Your Reference Sample Matrix Date Sampled Time Sample Taken	UNITS ----------	SE77631-1 B5 0.2 Soil 21/4/2010 2.00	SE77631-1 B6 0.3 Soil 21/4/2010 2.30
Date Analysed (moisture)		27/04/2010	27/04/2010
Moisture	%	16	16

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APPENDIX E - COMPARISON OF SOIL TEST DATA WITH RELEVANT GUIDELINES.

Soil samples – Contaminants – Page 1

ANALYTE	UNITS	LOR	B1 0.3	B1 0.6	B2 1.9	B3 1.2	B4 2.5	B5 0.2	B6 0.3					NSW DECCW^	NEPM A*	NEPM D#
TRH –C6-C9	mg/kg	20	<20	<20	<20	<20	<20	<20	<20							
C10-C14	mg/kg	20	<20	<20	<20	<20	<20	<20	<20						5,600	22,400
C15-C28	mg/kg	50	130	180	65	<50	<50	350	480							
C29-C36	mg/kg	50	130	200	<50	<50	<50	240	280							
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					1	-	
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					130	-	
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					50	-	
Xylene	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3					25	-	
B(a)P	mg/kg	0.05	***2.6***	***1.3***	***1.2***	***1.1***	0.10	0.35	***3.8***						1	4
PAH (TOTAL)	mg/kg	1.75	***<23.74***	<16.72	<14.74	<12.83	<2.28	<5.57	***57***						20	80

Note: Locations of soil samples are identified by reference to Appendix B

#NEPM D Residential with limited access to soils; * NEPM A – Residential access to soil; criteria for TPH is for C16-C35; ^ NSW DECCW Service Station Guidelines were no other is acailable.

57 Exceedances marked thus with bold and italics.

Soil samples/ continued –Metal Contaminants –Page 2

ANALYTE	UNITS	LOR	B1 0.3	B1 0.6	B2 1.9	B3 1.2	B4 2.5	B5 0.2	B6 0.3						NEPM A*	NEPM D#
As	mg/kg	3	4	5	16	3	<3	14	11						100	400
Cd	mg/kg	0.3	0.3	1.7	1.9	<0.3	<0.3	1.2	1.0						20	80
Cr (total)	mg/kg	0.3	22	17	27	4.0	2.0	33	23						100	400
Cu	mg/kg	0.5	38	77	320	28	9.4	180	470						1,000	4,000
Ni	mg/kg	0.5	26	20	18	2.7	0.7	19	19						600	2,400
Pb	mg/kg	1	86	230	***890***	48	17	170	***460***						300	1,200
Zn	mg/kg	0.5	95	170	600	89	13	190	310						7,000	28,000
Hg	mg/kg	0.05	0.20	0.75	1.2	0.09	<0.05	0.19	0.48						15	60

Note: Locations of soil samples are identified by reference to Appendix B
Note : A2 and A8 are field duplicates.

- NSW EPA Service Station Guidelines; * Guidelines for NSW Site Auditor Scheme
NEPM F – Standard Commercial etc.
Exceedances marked thus with bold and italics.

All VCH, PCB, OC and OP Laboratory results were less than the PQL and as such meet the requirements of NEPM A and D.

APPENDIX F - PID METER RESULTS

All duplicate samples taken from Test Pits were recorded as being within +/- 5% of background levels. Background was recorded as 3ppm and 4ppm at the start and close of sampling respectively. The relatively high background level is suspected to have occurred as a result of the proximity of adjacent gum trees and the excavator utilized to excavate the test pits.

APPENDIX G – SURROGATE & SPIKE QA/QC

Method ID	Methodology Summary
SEO-018	BTEX / C6-C9 Hydrocarbons - Soil samples are extracted with methanol, purged and concentrated by a purge and trap apparatus, and then analysed using GC/MS technique. Water samples undergo the same analysis without the extraction step. Based on USEPA 5030B and 8260B
SEO-020	Total Recoverable Hydrocarbons - determined by solvent extraction with dichloromethane / acetone for soils and dichloromethane for waters, followed by instrumentation analysis using GC/FID. Where applicable Solid Phase Extraction Manifold technique is used for aliphatic / aromatic fractionation
SEO-030	Polynuclear Aromatic Hydrocarbons - determined by solvent extraction with dichloromethane / acetone for soils and dichloromethane for waters, followed by instrumentation analysis using GC/MS SIM mode
SEO-005	OC/OP/PCB - Determination of a suite of Organochlorine Pesticides, Chlorinated Organo-phosphorus Pesticides and Polychlorinated Biphenyls (PCB's) by liquid-liquid extraction using dichloromethane for waters, or mechanical extraction using acetone / hexane for soils, followed by instrumentation analysis using GC/ECD. Based on USEPA 8081/8082
AN420	Semi Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates, and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD/FID technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN101	pH - Measured using pH meter and electrode based on APHA 21st Edition, 4500-H+. For water analyses the results reported are indicative only as the sample holding time requirement specified in APHA was not met (APHA requires that the pH of the samples are to be measured within 15 minutes after sampling)
SEM-010	Determination of elements by ICP-OES following appropriate sample preparation / digestion process. Based on USEPA 6010C / APHA 21st Edition, 3120B
SEM-005	Mercury - determined by Cold Vapour AAS following appropriate sample preparation or digestion process. Based on APHA 21st Edition, 3112B
AN002	Preparation of soils, sediments and sludges undergo analysis by either air drying, compositing, subsampling and 1:5 soil:water extraction where required. Moisture content is determined by drying the sample at 105 +

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QUALITY CONTROL BTEX in Soil	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (BTEX)				27/04/2010	SE77631-1	27/04/2010 || 27/04/2010	LCS	27/04/2010
Date Analysed (BTEX)				27/04/2010	SE77631-1	27/04/2010 || 27/04/2010	LCS	27/04/2010
Benzene	mg/kg	0.1	SEO-018	<0.1	SE77631-1	<0.1 || <0.1	LCS	89%
Toluene	mg/kg	0.1	SEO-018	<0.1	SE77631-1	<0.1 || <0.1	LCS	89%
Ethylbenzene	mg/kg	0.1	SEO-018	<0.1	SE77631-1	<0.1 || <0.1	LCS	89%
Total Xylenes	mg/kg	0.3	SEO-018	<0.3	SE77631-1	<0.3 || <0.3	LCS	86%
BTEX Surrogate (%)	%	0	SEO-018	88	SE77631-1	86 || 99 || RPD: 14	LCS	114%

QUALITY CONTROL TRH in soil with C6-C9 PT	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)				27/04/2010	SE77631-1	27/04/2010 || 27/04/2010	LCS	27/04/2010
Date Analysed (TRH C6-C9 PT)				27/04/2010	SE77631-1	27/04/2010 || 27/04/2010	LCS	27/04/2010
TRH C6 - C9 P&T	mg/kg	20	SEO-018	<20	SE77631-1	<20 || <20	LCS	107%
Date Extracted (TRH C10-C36)				27/04/2010	SE77631-1	27/04/2010 || 27/04/2010	LCS	27/04/2010
Date Analysed (TRH C10-C36)				27/04/2010	SE77631-1	27/04/2010 || 27/04/2010	LCS	27/04/2010
TRH C10 - C14	mg/kg	20	SEO-020	<20	SE77631-1	<20 || <20	LCS	100%
TRH C15 - C28	mg/kg	50	SEO-020	<50	SE77631-1	130 || 120 || RPD: 8	LCS	111%
TRH C29 - C36	mg/kg	50	SEO-020	<50	SE77631-1	130 || 150 || RPD: 14	LCS	93%

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REPORT NO: SE77631

QUALITY CONTROL PAHs in Soil	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted				27/4/10	SE77631-1	27/04/2010 || 27/04/2010	LCS	27/4/10
Date Analysed				27/4/10	SE77631-1	27/04/2010 || 27/04/2010	LCS	27/4/10
Naphthalene	mg/kg	0.1	SEO-030	<0.10	SE77631-1	0.25 || 0.15 || RPD: 54	LCS	85%
2-Methylnaphthalene	mg/kg	0.1	SEO-030	<0.10	SE77631-1	0.31 || 0.14 || RPD: 76	[NR]	[NR]
1-Methylnaphthalene	mg/kg	0.1	SEO-030	<0.10	SE77631-1	0.19 || 0.11 || RPD: 53	[NR]	[NR]
Acenaphthylene	mg/kg	0.1	SEO-030	<0.10	SE77631-1	0.20 || 0.22 || RPD: 10	LCS	96%
Acenaphthene	mg/kg	0.1	SEO-030	<0.10	SE77631-1	<0.10 || <0.10	LCS	128%
Fluorene	mg/kg	0.1	SEO-030	<0.10	SE77631-1	<0.10 || <0.10	[NR]	[NR]
[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	LCS	117%
Anthracene	mg/kg	0.1	SEO-030	<0.10	SE77631-1	0.27 || 0.44 || RPD: 48	LCS	117%
Fluoranthene	mg/kg	0.1	SEO-030	<0.10	SE77631-1	3.5 || 2.5 || RPD: 33	LCS	111%
Pyrene	mg/kg	0.1	SEO-030	<0.10	SE77631-1	4.4 || 2.6 || RPD: 51	LCS	122%
Benzo[a]anthracene	mg/kg	0.1	SEO-030	<0.10	SE77631-1	2.5 || 1.3 || RPD: 63	[NR]	[NR]
Chrysene	mg/kg	0.1	SEO-030	<0.10	SE77631-1	2.3 || 1.2 || RPD: 63	[NR]	[NR]
Benzo[b,k]fluoranthene	mg/kg	0.2	SEO-030	<0.20	SE77631-1	3.6 || 2.5 || RPD: 41	[NR]	[NR]
Benzo[a]pyrene	mg/kg	0.05	SEO-030	<0.05	SE77631-1	2.6 || 1.4 || RPD: 60	LCS	104%
Indeno[123-cd]pyrene	mg/kg	0.1	SEO-030	<0.10	SE77631-1	1.3 || 0.89 || RPD: 37	[NR]	[NR]
Dibenzo[ah]anthracene	mg/kg	0.1	SEO-030	<0.10	SE77631-1	0.22 || 0.20 || RPD: 10	[NR]	[NR]
Benzo[ghi]perylene	mg/kg	0.1	SEO-030	<0.10	SE77631-1	0.94 || 1.1 || RPD: 16	[NR]	[NR]
Total PAHs (sum)	mg/kg	1.75	SEO-030	<1.7	SE77631-1	<23.74 || <16.20	[NR]	[NR]
Nitrobenzene-d5	%	0	SEO-030	82	SE77631-1	93 || 113 || RPD: 19	LCS	85%
2-Fluorobiphenyl	%	0	SEO-030	84	SE77631-1	88 || 93 || RPD: 6	LCS	88%
p-Terphenyl-*d*14	%	0	SEO-030	90	SE77631-1	91 || 106 || RPD: 15	LCS	90%

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QUALITY CONTROL OC Pesticides in Soil	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted				28/04/10	[NT]	[NT]	LCS	28/04/10
Date Analysed				28/04/10	[NT]	[NT]	LCS	28/04/10
HCB	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
gamma-BHC (Lindane)	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
Heptachlor	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	LCS	105%
Aldrin	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	LCS	96%
beta-BHC	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
delta-BHC	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	LCS	86%
Heptachlor Epoxide	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
o,p-DDE	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
[illegible]	[illegible]	0.1	[illegible]	[illegible]	[illegible]	[NT]	[NR]	[NR]
trans-Chlordane	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
cis-Chlordane	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
trans-Nonachlor	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
p,p-DDE	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
Dieldrin	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	LCS	94%
Endrin	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	LCS	108%
o,p DDD	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
o,p DDT	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
beta-Endosulfan	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
p,p DDD	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
p,p-DDT	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	LCS	104%
Endosulfan Sulphate	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
Methoxychlor	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endrin Ketone	mg/kg	0.1	SEO-005	<0.1	[NT]	[NT]	[NR]	[NR]
2,4,5,6 Tetrachloro-m-xylene (Surrogate	%	0	SEO-005	110	[NT]	[NT]	LCS	105%

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QUALITY CONTROL OP Pesticides in Soil by GCMS	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted				27/4/10	SE77631-1	27/04/2010 || 27/04/2010	LCS	27/4/10
Date Analysed				27/4/10	SE77631-1	27/04/2010 || 27/04/2010	LCS	27/4/10
Dichlorvos	mg/kg	1	AN420	<1	SE77631-1	<1 || <1	LCS	99%
Dimethoate	mg/kg	1	AN420	<1	SE77631-1	<1 || <1	[NR]	[NR]
Diazinon	mg/kg	0.5	AN420	<0.5	SE77631-1	<0.5 || <0.5	LCS	66%
Fenitrothion	mg/kg	0.2	AN420	<0.2	SE77631-1	<0.2 || <0.2	[NR]	[NR]
Malathion	mg/kg	0.2	AN420	<0.20	SE77631-1	<0.20 || <0.20	[NR]	[NR]
Chlorpyrifos-ethyl	mg/kg	0.2	AN420	<0.2	SE77631-1	<0.2 || <0.2	LCS	109%
Parathion ethyl	mg/kg	0.2	AN420	<0.2	SE77631-1	<0.2 || <0.2	[NR]	[NR]
Bromofos-ethyl	mg/kg	0.2	AN420	<0.2	SE77631-1	<0.2 || <0.2	[NR]	[NR]
Methidathion	mg/kg	0.5	AN420	<0.5	SE77631-1	<0.5 || <0.5	[NR]	[NR]
Ronnel	mg/kg	0.2	AN420	<0.2	SE77631-1	<0.2 || <0.2	LCS	97%
Azinphos-methyl	mg/kg	0.2	AN420	<0.20	SE77631-1	<0.20 || <0.20	[NR]	[NR]
2-fluorobiphenyl (Surr)	%	0	AN420	85	SE77631-1	93 || 89 || RPD: 4	LCS	104%
d14-p-Terphenyl (Surr)	%	0	AN420	90	SE77631-1	91 || 89 || RPD: 2	LCS	90%

QUALITY CONTROL Inorganics	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted- (pH 1:5 soil: Water)				[NT]	SE77631-1	29/04/2010 || 29/04/2010
Date Analysed (pH 1:5 Soil: Water)				[NT]	SE77631-1	29/04/2010 || 29/04/2010
pH 1:5 soil:water	pH Units	0	AN101	[NT]	SE77631-1	8.7 || 8.7 || RPD: 0

QUALITY CONTROL Metals in Soil by ICP-OES	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (Metals)				28/04/2010	[NT]	[NT]	LCS	28/04/2010
Date Analysed (Metals)				28/04/2010	[NT]	[NT]	LCS	28/04/2010
Arsenic	mg/kg	3	SEM-010	<3	[NT]	[NT]	LCS	94%
Cadmium	mg/kg	0.3	SEM-010	<0.3	[NT]	[NT]	LCS	98%
Chromium	mg/kg	0.3	SEM-010	<0.3	[NT]	[NT]	LCS	98%
Copper	mg/kg	0.5	SEM-010	<0.5	[NT]	[NT]	LCS	96%
Lead	mg/kg	1	SEM-010	<1	[NT]	[NT]	LCS	97%

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QUALITY CONTROL Metals in Soil by ICP OES	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Nickel	mg/kg	0.5	SEM-010	<0.5	[NT]	[NT]	LCS	100%
Zinc	mg/kg	0.5	SEM-010	<0.5	[NT]	[NT]	LCS	96%

QUALITY CONTROL Mercury Cold Vapor/Hg Analyser	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (Mercury)				28/04/2010	[NT]	[NT]	LCS	28/04/2010
Date Analysed (Mercury)				28/04/2010	[NT]	[NT]	LCS	28/04/2010
Mercury	mg/kg	0.05	SEM-065	<0.05	[NT]	[NT]	LCS	98%

QUALITY CONTROL Moisture	UNITS	LOR	METHOD	Blank
Date Analysed (moisture)				[NT]
Moisture	%	1	AN002	<1

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Result Codes

[INS]	Insufficient Sample for this test	[RPD]	Relative Percentage Difference
[NR]	Not Requested	*	Not part of NATA Accreditation
[NT]	Not tested	[N/A]	Not Applicable
[LOR]	Limit of reporting		

Report Comments

QC LOR raised due to sample matrix interference

PAH - # 1 duplicate not match within acceptance criteria due to inhomogeneous sample

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

Date Organics extraction commenced:

NATA Corporate Accreditation No. 2562. Site No 4354

Note: Test results are not corrected for recovery (excluding Air-toxics and Dioxins/Furans*)

Quality Control Protocol

Method Blank: An analyte free matrix to which all reagents are added in the same volume or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. A method blank is prepared every 20 samples.

Duplicate: A separate portion of a sample being analysed that is treated the same as the other samples in the batch. One duplicate is processed at least every 10 samples.

Surrogate Spike: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. Surrogates are added to samples before extraction to monitor extraction efficiency and percent recovery in each sample.

Internal Standard: Added to all samples requiring analysis for organics (where relevant) or metals by ICP after the extraction/digestion process; the compounds/elements serve to give a standard of retention time and/or response, which is invariant from run-to-run with the instruments.

Laboratory Control Sample: A known matrix spiked with compound(s) representative of the target analytes. It is used to document laboratory performance. When the results of the matrix spike analysis indicates a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

Matrix Spike: An aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Quality Acceptance Criteria

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

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