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PRELIMINARY ASSESSMENT OF REEDY'S ORCHARD KELSO NEW SOUTH WALES FOR CONTAMINATION APRIL 2005 CENTRAL WEST ENVIROTECH LABORATORY REPORT

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CONTENTS

1. SUMMARY

A preliminary soil contamination study was conducted at "Reedy's Orchard", Sydney Road, Kelso, New South Wales, on 31st March 2005. The site was a former Peach (*Prunus*) orchard for approximately 20 years until about 1985 when the trees were removed and the land was returned to pasture

The study was initiated at the request of Gary Sloan, to obtain a preliminary estimation of contamination prior to potential re-development of the site for commercial bulky goods and rail transit hub. A preliminary site visit conducted in March 2005 indicated that the site was, and had previously been agricultural land. Hence potential contamination was most likely to derive from orchard activities.

Thirty two soil pits were excavated to a depth of approximately 0.5 m. Twenty four soil samples were analysed for physicochemical properties such as pH, EC and texture to characterize resident soil types.

Eight composite topsoil samples were analysed for pesticides and heavy metals to determine the impact of agrichemical use from the establishment of the orchard in about 1965 to the present day.

Analytical results were compared with appropriate Australian Human Health-Based soil Investigation Level (HHBIL) 'A'- guidelines for residential areas.

None of the composite samples was found to contain organochlorine insecticides including derivatives of DDT and endosulfan above respective HHBILs. No composite was found to contain heavy metals typically associated with orchards above respective guidelines.

The results are consistent with the short (20 year) lifespan of the orchard and the low application schedule of pesticides applied. Soil pits encountered no introduced fill. Nor was any hydrocarbon or other chemical inventory exposed during the study. Soil type was typical for Raglan and Bathurst soil scapes. The data indicate a low risk of contamination

Table 1 Summary of Analytical Results

8 Samples	mg/kg								
	PCB		DDT	Copper	Lead	Zinc	Arsenic	Cadmium	Mercury
HHBIL	10	na	200	1000	300	7000	100	20	15
Mean	<0.1	<0.05	<1.2	67	10	13	1.1	0.1	<0.05
PMC	3.6	<2	6.6	396	48	72	8	0.8	0.2
Uncert.	V.Low	V.Low	V.Low	V.Low	V. Low	V. Low	V. Low	V. Low	V. Low

HHBIL = Human Health-Based Investigation A Level for Residential with Garden/Accessible Soil (Imray and Langley 1996)
PMC = Potential Maximum Concentration – One sub-sample in four having contaminant concentration above baseline levels
Uncert. = Likelihood of an undisclosed hotspot with contaminant above the A-'residential/garden' threshold.

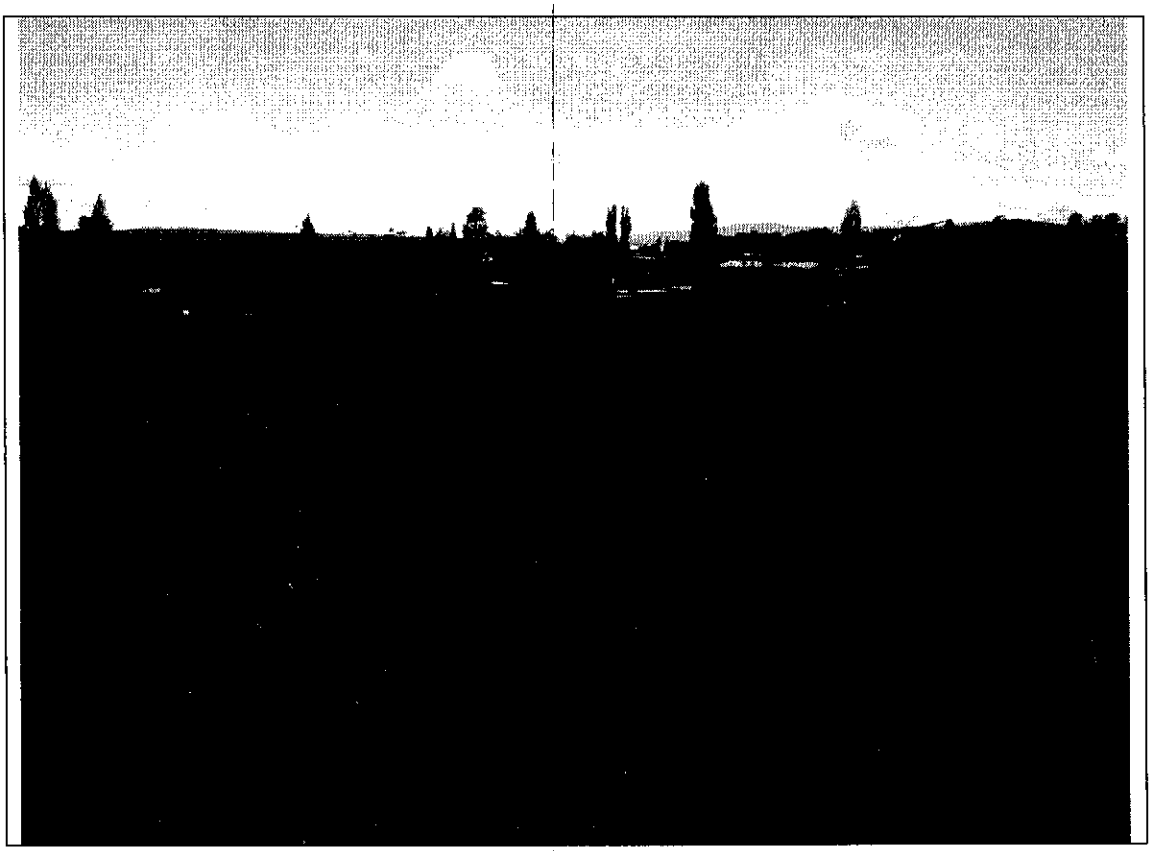
2. INTRODUCTION

A preliminary 'orchard' soil contamination study of the 9.55 ha former peach orchard, Sydney Road Kelso, formerly owned by Anthony Reedy senior, was conducted in on 31st March 2005, to estimate the distribution and magnitude of contamination, potentially deriving from two decades of stone fruit cool season orchard use. The excavation of soil pits would also identify inconsistencies in soil type that may be related to alternative past landuses.

Approximately 3 test pits per hectare of ex-orchard land were excavated to reveal soil characteristics and quantify soil characteristics. Analysis of topsoil for pesticides and heavy metals typically associated with orchard production revealed an absence of significant residues.

None soil pit was associated with foreign fill or undisclosed ordinance. The results of soil characterization and analysis indicate that landuse has been agricultural, with topsoil disturbance typically associated with cultivation, but no other evidence of significant excavation or burial. A possible exception is the 0.2 ha former quarry at the entrance to Sydney Road, which was excavated before 1960, and which has no obvious batter comprising introduced fill. Eight composite samples were prepared from 32 topsoil samples and analysed for pesticides and metals. No residues were detected.

Figure 1 Former Reedy's Orchard View North East to Sydney Road



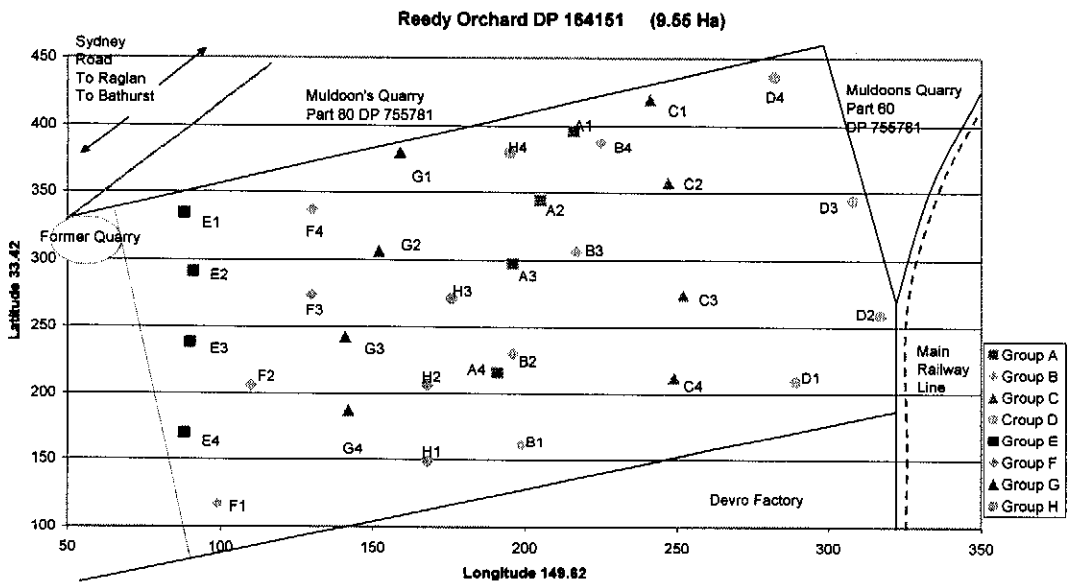
3. BACKGROUND

The study was initiated by Gary Sloane, to estimate contamination potentially deriving from past landuse. The site would be considered for commercial development as a bulky goods terminal. A preliminary site visit confirmed that past land use included a stone fruit orchard. Site history details indicated that landuse prior to 1960 was agrarian. A small excavated area at the north east corner adjoining the Sydney Road indicated some quarrying had taken place prior to Mr. Reedy's occupation. The size of the quarry and topography indicated that excavation was not associated with stockpiled or imported fill.

3.1 Location

A single preliminary contaminated site assessment was conducted on the former Reedy Orchard (9.55 ha), D.P. 164151, County of Roxburgh, Shire and Municipality of Bathurst. The site can be located at 743700 E and 6298700 N on the Bathurst 8831-3-S 1:25,000 topographical map. The street address of the Orchard is Sydney Road, Kelso, New South Wales.

Figure 1 Sampling Points in D. P. 164151 – Reedy's Orchard



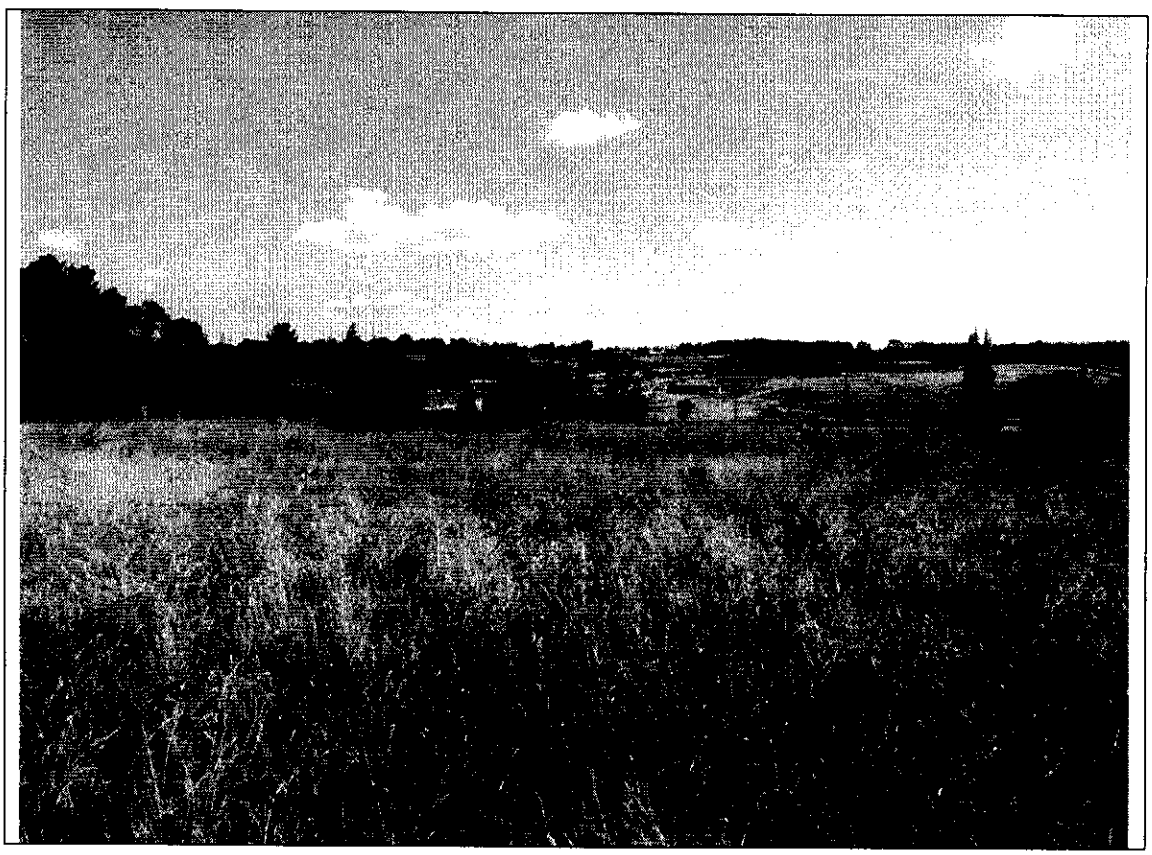
3.2 Site Description

At the time of conduct of the study, the land of DP 164151 was vacant agrarian land, predominantly vegetated with introduced perennial grasses and broad leaf weeds. Four remnant fruit trees were located centrally at G3 and H2 (see Map).

A retail fruit outlet and storage shed occupied the Sydney Road Frontage at the north west corner of the site. Three residential blocks also abutting with Sydney Road were situated on the north east side of the site adjacent to a small former quarry, which occupied the north east corner of the site.

The site was situated on relatively even sloping land (<5%) with a slight central rise to 700 m and less than 10 fall throughout the orchard.

Figure 2 Former Reedy's Orchard View North West to Packing Shed



3.3 Site History

The orchard was planted by Anthony Reedy (sr.) in about 1965. According to Mr. Reedy, it comprised approximately 1 hectare of apple (*Pome*) trees, predominantly the Jonathon variety, located at the north end of the orchard in the vicinity of test pits E1-E4 and F1–F4. A further 6 hectares was dedicated to peach (*Prunus*), approximately 2700 trees, south of the apple grove.

The orchard was removed in about 1985. The trees were uprooted, piled and burned and the land cultivated to pasture, which was stocked with cattle periodically. Currently, only four fruit trees, in the vicinity of G3 and H2, remain.

Mr Reedy, may have applied a standard regime of agrichemicals to the orchard in accordance with NSW Agriculture horticultural guidelines. The program comprised COICIDE® (copper-based) and winter oil sprays in May and August and ZIRAM® applications at 7 day intervals during August. Occasional insecticide (MAVRICK® and CONFIDOR®) applications were generally made in October for aphid control. Spot spraying with Chlorpyrifos for control of San Jose Scale and earwigs was occasionally carried out around November, and depending on pest pressure, one to two weeks of fungicide (TILT®, ROVRAL®) applications were made during the summer months –December to February.

The above pesticide schedule might be expected to yield trace amounts of copper, manganese and zinc. Spot spraying with chlorpyrifos might be expected to yield traces of this moderately persistent chlorinated organophosphate insecticide in prunings and ground in stumps, if conducted intensively over a decade or more. One might expect negligible to low organochlorine insecticide contamination, since use of OCs including DDT continued until the early 1990s. Other insecticides such as Lindane were discontinued in the 1980s. Endosulfan, a more recently developed chlorinated insecticide, is unlikely to be present in greater concentration than DDTs. Inorganic pesticides such as lead arsenate and to a lesser extent, mercuric chloride, were still in use during the 1960s. Residues of arsenic, lead and mercury might be expected, but less so than an orchard dating from the 1920s and 1930s.

Figure 3 Former Reedy Orchard View East over Muldoon Allotment

A small quarry was excavated at the north east corner of the site prior to Mr. Reedy's ownership. He can recall no evidence of usage of the small quarry in the past four decades. Prior to establishment of the orchard, the landuse was agricultural (grazing).

3.4 Geology and Hydrology

Parent geology derives from the Bathurst Batholith which is described as coarse grained porphyritic biotite granite. Quartz content is approximately 20% which is consistent with the abundance of coarse grained sand in topsoil and clay at the interface with decomposed granite, which was encountered throughout the site at shallow depths of 0.1-0.7 m.

The site has characteristics of both the Bathurst and Raglan soilscapes, which are part of the Bathurst Batholith. In these soilscapes granodiorite frequently overlays biotite granite. The dominant soil types for Bathurst and Raglan soilscapes are non calcic brown and red solodic, with yellow solodic soils in drainage depressions. Table 2 summarizes the geology and soil types of the Kelso locality:

Table 2 Geology and Soil Types of the Bathurst Region

Map	Bathurst 1:100 000 series
Geological Unit	Bathurst Granite
Parent Rock	Medium to coarse grained and massive granodiorites and adamellites
Parent material	Alluvial-colluvial deriving from above parent rock
Formation	Bathurst batholith (Cbg) coarse grained porphrytic biotite granite with orthoclase megacysts and hornblend biotite granadiorite
Adj. formation	(Qa) alluvium gravel, sand silt clay
Dominant Soil Red Solodic	Topsoil: A1 Reddish or Dark Brown Sandy Loam, pH 6.0 Subsoil: A2 Bleached Sandy Loam pH 6.5 Subsoil: B1 Reddish Brown Light to Heavy Clay pH 6.5 Subsoil: B2 Yellowish brown Heavy clay pH 8.3
Common Soil Non Calcic Brown	Topsoil: A1 Dark Brown Sandy Loam pH 6.0 Topsoil: A2 Reddish Brown Medium Clay pH 6.5 Subsoil: Dull Yellowish Brown Heavy Clay pH 6.5
Common Soil Yellow Solodic	Topsoil: A1 Brown to Brown Black Loamy Sand to sandy loam pH 5.7 Topsoil: A2 Bleached Yellow Brown to light grey sandy loam pH 7.0 Subsoil: Dull Yellow Brown mottled sandy clay loam to heavy clay pH 8.0-8.5.

Soil samples collected on site were generally dark brown loamy sand to sandy loams or clayey sand. A2 horizon was generally bleached dull brown sandy clay loam to clay loam. Subsoil was usually reddish brown or brown heavy clay to sandy clay. The soils encountered were most like a red solodic.

The site lies 2.5 km east of the Macquarie River, about 200 m west of, and 100 m south of seasonal tributaries of Raglan Creek which continue west to join the Macquarie River at about 20 m lower altitude (670 m), relative to the Orchard.

Figure 4 Profile of a Red Solodic Soil from mid slope Former Reedy Orchard

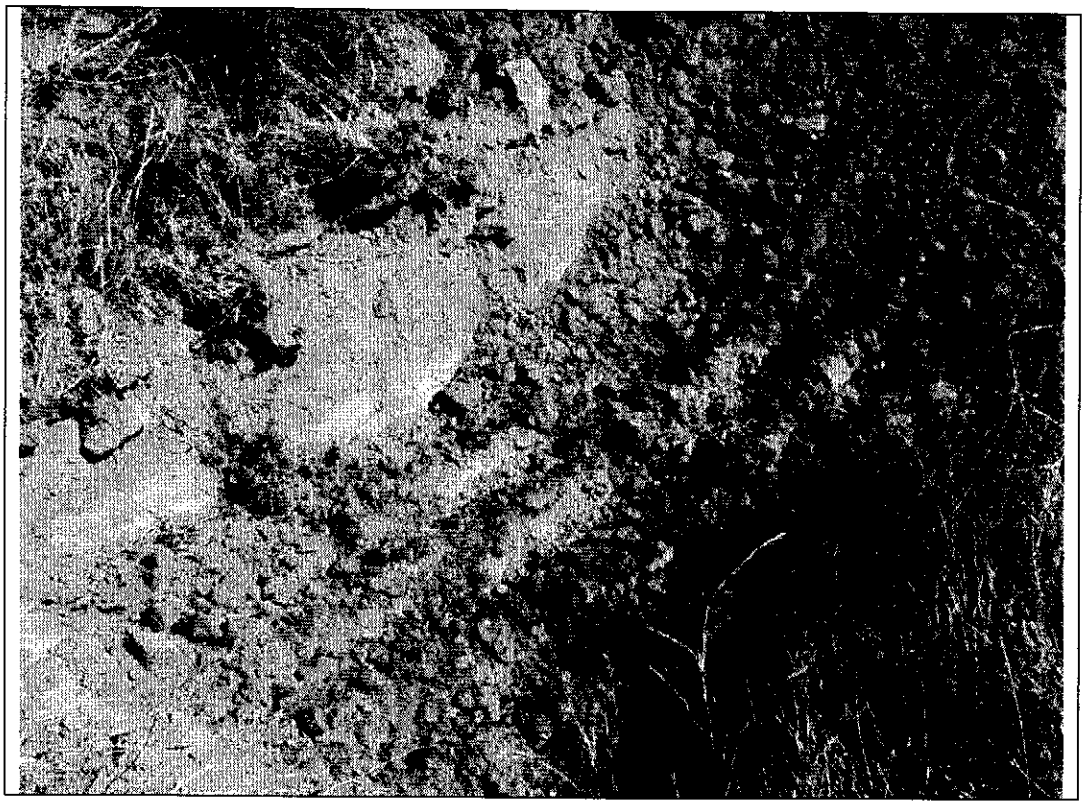
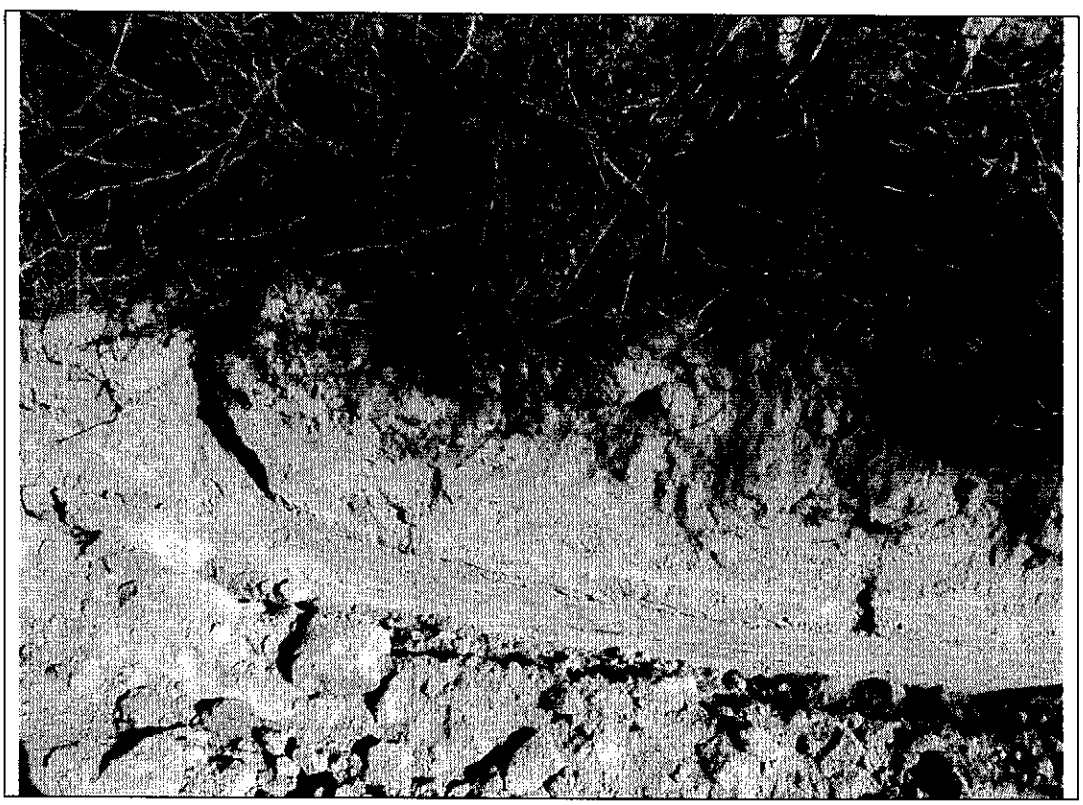


Figure 5 Profile of Yellow Solodic with heavy clay over weathered granite



4. METHODS

4.1 Location and Number of Samples

Eight composite topsoil (0 – 0.15 m) and eight composite subsoil (0.15 – 0.30 m) samples were collected from 32 test pits. The topsoil composites were analysed for pesticides and heavy metals. The soil samples were taken in a loose grid formation. The location of each of the test pits is shown in Figure 1, and the composite sample locations (1:25 000 topographic map) summarized in Table 3.

Table 3 Location of sampling areas

A	Former Peach Orchard Central	191 - 216	216 - 396
B	Former Peach Orchard Central South	196 - 225	161 - 387
C	Former Peach Orchard South	241 - 252	212 - 419
D	Former Peach Orchard Far South	282 - 317	209 - 436
E	Former Apple Grove North East	088 - 091	170 - 334
F	Former Apple Grove North	99 - 130	117 - 337
G	Former Peach Orchard North	142 – 159	187 - 379
H	Former Peach Orchard North west	168 - 195	149 - 379

4.2 Excavation of Test Pits

Soil Pits were excavated using a 32 tonne CATERPILLAR® excavator with 1.3 m wide bucket.

4.3 Sample Screening and Collection

Soil samples were collected from test pit side walls at prescribed depths, using a Jarrat-Dormer 75 mm hand auger. Humus was removed from the adherent soil by gentle shaking. Individual soil samples were collected in polythene bags for air-drying and physicochemical characterization. Composite samples were formed by combining equal volumes of soil from the same depth interval at 4 separate test pits. The composite samples were stored in Teflon lined 250 ml glass jars in the freezer at -20°C until dispatched for analysis. The location, soil texture and colour of topsoil and subsoil samples from each of the constituent sub-sampling points was recorded during excavation.

4.4 Decontamination

The auger head, trowel and stainless steel bowls were cleaned between collection of each sub sample, primarily by scraping and brushing adherent soil from the auger head, and secondarily by rinsing with tap water, where required. The full decontamination procedure was invoked when moist soil adhered to the auger. This comprised 4 steps:

1. Brushing away excess dirt with a stiff brush
2. Washing with 2% v/v liquid organic detergent
3. Sequential rinsing with municipal tap water (two rinses)
4. Air-drying before commencement of subsequent sampling

4.5 Dispatch

The soil samples stored in glass jars with Teflon lined lids, were wrapped in insulation and transported to an accredited analytical laboratory with sufficient coolant to maintain a <4°C temperature for the duration of transit (24 hours). The dispatched samples were accompanied by appropriate chain of custody documentation. The remaining jar samples were frozen until completion of the analyses for follow-up purposes.

4.6 Analysis

The composite topsoil samples in glass jars were dispatched for external analysis of organochlorine pesticides.

A 1:5 soil: distilled water mixture of air dried samples was prepared and analysed for electrical conductivity ($EC_{1:5}$) and pH_{H2O} using a TPS 90-FLMV electrochemical meter. The K10 electrical conductivity probe was calibrated against a 276 mS/cm standard. The Ionode IJ44 intermediate junction pH electrode was standardized against pH 6.88 phosphate and pH 4.0 phthalate standards.

The soil samples dispatched for external testing were analysed for organochlorine pesticides, organophosphate insecticides and eight metals including arsenic (As), copper (Cu), lead (Pb), Cadmium (Cd), Chromium (Cr), nickel (Ni) and zinc (Zn) and mercury (Hg) by LabMark laboratories Asquith, New South Wales.

Organochlorine insecticides were quantified using electron-capture detection - gas-liquid chromatography mass spectrometry (ECD-GCMS). Organophosphate insecticide concentrations were determined using flame thermionic detection and GCMS. Metals were determined after acid digest by inductively coupled plasma absorption/emission spectrometry (ICPAES) and inductively coupled plasma mass spectrometry (ICP-MS). Certificate of Analysis Sheets for Organochlorines and Metals are shown in Appendix 7.1.

4.7 Reporting

The results of analyses were assessed in relation to Commonwealth Environment Protection Agency and Department of Health and Family Sevices contaminated site guideline criteria.

5. RESULTS AND DISCUSSION

5.1 Field Data

Soil samples were visually and olfactorily assessed during test pit excavation. The full data recorded during sampling is shown in Appendix 7.2 and summarised in Table 4 below:

Table 4 Field Texture and Colour

Sandy Loam or Fine Sandy Loam	Brown/Dark Brown Grey/Yellow Brown	20 (63%) 2 (6 %)	1 (3%) 1 (3%)	
Sandy Clay Loam or Fine Sandy Clay Loam	Dark Brown/Brown Dark Greyish Brown	8 (25%) 1 (3%)	16 (50%)	
Clay Loam	Yellow Brown Brown	1 (3%)	 10 (31%)	
Sandy Clay or SCL	Red Brown			2 (12%) 4 (24%)
Heavy Clay	Dark Brown or Orange		2 (6%)	3 (18%)
	Red or Red Brown		2 (6%)	9 (52%)

From Table 4, it is evident that topsoil was generally dark brown sandy loam or a brown sandy clay loam. Topsoil A2 horizon, was generally bleached brown sandy clay loam or brown clay loam. Subsoil was generally red to reddish brown heavy clay, sometime brown or orange, sometimes sandy clay.

5.2 Laboratory Data

5.2.1 Electrical conductivity and pH

A total of twenty four individual soil samples were tested for physicochemical properties by C W Envirotech Orange N.S.W. The data for texture, colour, $EC_{1:5}$, texture-dependent electrical conductivity (ECe) and pH (water) of the 24 samples is shown in Appendix 7.2 The data are summarized in Table 5.

Table 5 Soil Electrical Conductivity and pH

Level	Depth (m)	Median Texture	Median Colour	$EC_{1:5}$ ❶ (uS/cm)	ECe ❷ dS/m	pH water
Topsoil	0 - 0.3	Loamy Sand	Dark Brown	40 ± 20	1.0 ± 0.6	6.1 ± 0.3
A2 horizon	0 - 0.3	Sandy Clay Loam	Brown	27 ± 13	0.3 ± 0.1	6.1 ± 0.3
Subsoil	0 – 0.5	Medium Clay	Reddish Brown	30 ± 6	0.2 ± 0.1	6.5 ± 0.3
Subsoil outlier❸	0 – 0.5	Heavy Clay	Yellowish Brown & Dark Grey Mottle	142	0.8	8.2

❶ $EC_{1:5}$ = Electrical conductivity of a 1:5 soil: distilled water extract
❷ ECe = Electrical conductivity equivalent to the electrical conductivity of the saturation extract – determined as the product of the appropriate soil texture factor and $EC_{1:5}$.
❸ Outlier has an ECe and a pH which is 2 standard deviations above the mean

From Table 5, it is evident that the orchard soil was generally a dark brown loamy sand of pH 6.1. The A2 topsoil was generally bleached brown sandy clay loam of pH 6.1; and subsoil was usually a reddish brown heavy clay of pH 6.5.

The laboratory data confirm that the resident soil was typically red solodic and occasionally yellow solodic. The higher salinity and pH associated with samples such as subsoil from test pit F4 are in this instance still consistent with soil type.

No soil was encountered that was atypical for the Bathurst-Ragan region. Appendix 7.2 lists the field pH and EC data for the 24 individual soil samples tested.

5.2.2 Organochlorine Pesticides

Topsoil samples were analysed for a suite of organochlorine pesticides (refer Table 6), several of which have been included in traditional pesticide spray regimes from the early 1940s to early 1990s. The only organochlorine-type insecticide/acaricide commonly used in Australian that is still registered for use in orchards is endosulfan.

Table 6 Organochlorine Pesticides

Organochlorine Pesticide	A	B	C	D	E	F	G	H	Composite Threshold	HHBIL Threshold
α, β, γ and δ-BHC,HCB	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	2.5	10
Heptachlor, Heptachlor epoxide, Methoxychlor,	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	12.5	50
cis- and *trans* Chlordane	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	2.5	10
Aldrin, Dieldrin, Endrin, Endrin ketone/aldehyde	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	2.5	10
Endosulfan (I, II and sulphate)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	2.5	10
4,4-DDD, 4,4-DDE, 4,4-DDT	1.39	0.93	1.64	1.3	1.45	1.12	1.17	1.19	50	200

Threshold = Human Health-Based Investigation A Levels (HHBIL) - Standard Residential with garden/accessible soil (Imray and Langley 1996)

From Table 6, it is evident that none of the 32 test pits yielded topsoil (0 – 0.3 m) with residues of organochlorine pesticides other than DDTs, in any of the 32 test pits excavated on the Reedy Orchard. DDT and DDT analogues were present at very low concentration (1 – 2 mg/kg) in all eight composite samples, which is strongly indicative of the past landuse as an orchard.

None of the organochlorine –type pesticides were detected in any composite sample above the limits of analysis of 0.05 mg/kg, which means that the residues were absent or at most one-two hundredth of the lowest Human Health-Based Investigation Level (HHBIL) threshold.

The organophosphate pesticide (OP) analysis included 10 compounds that might be used on orchard insect pests. Only two could by regarded as mildly persistent

by virtue of chlorine moieties. Diazinon is more often associated with sheep husbandry.

Table 7 Organophosphate Pesticides

Organophosphate Insecticides	A	B	C	D	E	F	G	H
Diazinon	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dimethoate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion, Methyl Parathion	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Malathion, Fenitrothion	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ronnel, Chlorpyrifos	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos-methyl	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton and others (10)	<1	<1	<1	<1	<1	<1	<1	<1

Table 7 shows that no OP residues were detected in any composite soil sample. The vast majority of OPs are not persistent in the soil environment, by virtue of hydrolytic breakdown. It is not surprising that no residues of any of the twenty OPs analysed were found in any of the composite samples.

The eight composite samples were also analysed for eight heavy metals that might derive from inorganic orchard treatments such as Bordeaux mixture:

Table 8 Metals

Metals	A	B	C	D	E	F	G	H	Composite Threshold	HHBIL Threshold
Arsenic	1	<1	<1	2	<1	<1	<1	<1	25	100
Cadmium	<0.1	<0.1	0.2	0.1	0.1	0.1	0.1	<0.1	5	20
Chromium	13	7	8	11	16	16	7	6	25 - 3000	100 - 120000
Copper	88	66	99	88	49	55	46	43	250	1000
Lead	10	9	10	12	9	8	10	7	75	300
Mercury	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	4	15
Nickel	3	2	3	3	6	4	5	2	150	600
Zinc	13	10	15	15	10	11	18	9	1750	7000

Threshold = Human Health-Based Investigation A Levels (HHBIL) - Standard Residential with garden/accessible soil (Imray and Langley 1996). Light Shading indicates contamination which is above background levels, but less than the HHBIL. Dark shading indicates that the level detected is potentially higher than the HHBIL

From Table 8, it is evident that none of the composite soil samples had concentrations of the key heavy metals above respective Human Health-Based Investigation Thresholds.

Arsenic and Lead levels were very low at background concentrations, supporting the premise that the orchard was in existence during the mid 1960s to mid 1980s, since use of lead arsenate was significant in the first half of the twentieth century, and traces of these metals for older orchards are frequently an order of magnitude higher than encountered

6. CONCLUSION

Assessment of the Reedy Orchard (DP 164151) Sydney Road Kelso, New South Wales for contamination potentially deriving from orchard landuse revealed:

- Negligible contamination deriving from organochlorine pesticides
- Negligible contamination deriving from organophosphate pesticides
- very low levels of heavy metals typically associated with orchard production.

No pesticides or heavy metals were encountered above respective HHBILs.

Soil types and profiles were consistent with red solodic and non-calcic brown soils that derive from the Bathurst and Raglan soilscapes, both of which are underlain at shallow depth by weathered granodiorite and decomposed granite.

Weathered granitic material was encountered at shallow depth (0.1 – 0.7 m) throughout the site. No introduced soil or fill or buried inventory such as asbestos or hydrocarbons was encountered in this investigation

Further work might include closer inspection of the Sydney Road frontage, specifically the small quarry and land immediately east of the retail fruit outlet/storage. Preliminary site visits did not identify features that might implicate these areas as sources of significant contamination. The chemical storage and mixing area is normally the most likely site of a "hotspot". At the time of this investigation, the water filling point was located at the packing/ retail shed, and it is likely that mixing took place at the north west corner of the site.

The short duration (20 years) of orchard establishment and absence of pre-existing orchard or similar landuse, mitigates against significant long term spillage. Should future landuse of a residential or similarly sensitive nature be proposed in proximity or on the site of the current storage shed, composite sampling of the substrate around the packing shed and east to the residential allotments may be conducted for analysis of appropriate pesticides and heavy metals.

The second sub-site that may require further validation if a sensitive landuse is proposed is the small former quarry at the north east corner of the site. No evidence of imported fill or spillage of hazardous substances was observed during site inspection, apart from the transient storage of building materials that may have contained asbestos. This is no longer the case. The quarry floor and perimeter of the shed might be sampled and tested should preliminary excavations show any introduced fill stained soil or abnormal discontinuities in the soil profile. There is anecdotal evidence that the site was a gravel source pre-dating the former Kelso Gravel Quarry which was located further south.

LabMark Central West Envirotech NATA AQIS

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No:	E022211	Cover Page 1 of 4	
Client Name:	Central West Envirotech	plus Sample Results	
Client Reference:	0507DR - May assorted		
Contact Name:	James Milson		
Chain of Custody No:	na	Date Received:	15/06/2005
Sample Matrix:	OTHER & SOIL & WATER	Date Reported:	21/06/2005

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occured within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy:	matrix spike:	1 in first 5-20, then 1 every 20 samples
	lcs, crm, method:	1 per analytical batch
	surrogate spike:	addition per target organic method
Precision:	laboratory duplicate:	1 in first 5-10, then 1 every 10 samples
	laboratory triplicate:	re-extracted & reported when duplicate RPD values exceed acceptance criteria
Holding Times:	soils, waters:	Refer to LabMark Preservation & THT table VOCs 14 days water / soil VACs 7 days water or 14 days acidified VACs 14 days soil SVOCs 7 days water, 14 days soil Pesticides 7 days water, 14 days soil Metals 6 months general elements Mercury 28 days
Confirmation:	target organic analysis:	GC/MS, or confirmatory column
Sensitivity:	EQL:	Typically 2-5 x Method Detection Limit (MDL)

QUALITY CONTROL GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy:	spike, lcs, crm surrogate:	general analytes 70% - 130% recovery phenol analytes 50% - 130% recovery organochlorine pesticide analytes 60% - 130% recovery phenoxy acid herbicides 50% - 130% recovery
	acids/alkalis bal:	+/- 10% (0-3 meq/l), +/- 5% (>3 meq/l)
Precision:	method blank:	not detected >95% of the reported EQL
	duplicate lab RPD (metals):	0-30% (>10xEQL), 0-75% (5-10xEQL), 0-100% (<5xEQL)
	duplicate lab RPD:	0-50% (>10xEQL), 0-75% (5-10xEQL), 0-100% (<5xEQL)

QUALITY CONTROL ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy:	spike, lcs, crm surrogate:	analyte specific recovery data <3xsd of historical mean
Uncertainty:	spike, lcs:	measurement calculated from historical analyte specific control charts

RESULT ANNOTATION

DQO:	Data Quality Objective	s:	matrix spike recovery	p:	pending
DQI:	Data Quality Indicator	d:	laboratory duplicate	lcs:	laboratory control sample
EQL:	Estimated Quantitation Limit	t:	laboratory triplicate	crm:	certified reference material
--:	not applicable	r:	RPD relative % difference	mb:	method blank

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NEPC 1999 DQO COMPLIANCE

1. GENERAL

A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.

B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.

C. Laboratory QA/QC samples are specific to this project.

D. Inter-laboratory proficiency results are available upon request. NATA accreditation details available at www.nata.asn.au.

E. VOC spikes & surrogates added to samples during extraction. SVOC spikes & surrogates added prior to extraction.

F. Recovery data outside GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.

G. Recovery data (mt, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomalous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.

H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.

I. LabMark shall maintain an official copy of this Certificate of Analysis for all tracable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

A. SRN issued to client upon sample receipt & login verification.

B. Preservation & sampling date details specified on COC and SRN, unless noted.

C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

A. NATA accreditation held for each method and sample matrix type reported, unless noted below.

B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 13542.

C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.

7. APPENDICES

7.1 Certificates of Analysis (LabMark Asquith NSW)

4. QA/QC FREQUENCY COMPLIANCE TABLE SPECIFIC TO THIS REPORT

Matrix: **OTHER**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
7	Acid extractable metals (M7)	12	2	17%	0	1	8%
10	Acid extractable mercury	12	2	17%	0	1	8%
17	Acid extractable metals	1	0	0%	0	0	0%
18	Moisture	12	--	--	--	--	--

Matrix: **SOIL**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	BTEX by P&T	3	0	0%	0	0	0%
1	Volatile TPH by P&T (vTPH)	3	0	0%	0	0	0%
2	Petroleum Hydrocarbons (TPH)	3	0	0%	0	0	0%
3	Organochlorine Pesticides (OC)	8	1	13%	0	1	13%
5	Organophosphorus Pesticides	8	1	13%	0	1	13%
7	Acid extractable metals (M7)	12	2	17%	0	1	8%
10	Acid extractable mercury	12	2	17%	0	1	8%
18	Moisture	12	--	--	--	--	--

Matrix: **WATER**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
12	Filtered mercury	14	2	14%	0	1	7%
14	Filtered metals	14	2	14%	0	1	7%

NEPC guideline for laboratory duplicates is 1 in 10 samples (10%).
USEPA guideline for laboratory matrix spikes is 1 in 20 samples (5%).

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

A. Report re-issued with Lab #20336 analysed and reported for TPH, BTEX, metals as per client instructions, refer to reissued sample receipt notice. Lab #20336 was extracted outside THT for TPH, BTEX analysis, sample was kept refrigerated prior to analysis.

Laboratory QA/QC Self Assessment data shall relate specifically to this report, and may only provide an indication of sample result quality. Acceptance of this Self Assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC Self Assessment references available upon request.

Central West Envirotech 0513GS

Laboratory Identification			20338	20339	20340	20341	20342	20343	20344	20345	20338d	20338r
Sample Identification			0513GSA	0513GSB	0513GSC	0513GSD	0513GSE	0513GSF	0513GSG	0513GSH	QC	QC
Depth (m)			0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	--	--
Sampling Date recorded on COC			31/3/05	31/3/05	31/3/05	31/3/05	31/3/05	31/3/05	31/3/05	31/3/05	--	--
Laboratory Extraction (Preparation) Date			28/5/05	28/5/05	28/5/05	28/5/05	28/5/05	28/5/05	28/5/05	28/5/05	28/5/05	--
Laboratory Analysis Date			31/5/05	31/5/05	31/5/05	31/5/05	31/5/05	31/5/05	31/5/05	31/5/05	31/5/05	--
Method	**Organochlorine Pesticides (OC)**	**EQL**										
E013.2	a-BHC	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	HCB	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	b-BHC	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	g-BHC (Lindane)	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	d-BHC	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	Heptachlor	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	Aldrin	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	Heptachlor epoxide	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	trans-chlordane	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	Endosulfan I	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	cis-chlordane	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	Dieldrin	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	4,4-DDE	0.05	1.1	0.66	1.3	1.0	1.1	0.83	0.87	0.91	1.1	0.0%
	Endrin	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	Endosulfan II	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	4,4-DDD	0.05	0.09	0.07	0.14	0.1	0.15	0.09	0.1	0.08	0.09	0.0%
	Endosulfan sulphate	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
	4,4-DDT	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--
	Methoxychlor	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--
	DBC (Surr @ 0.2mg/kg)	--	*88%*	*84%*	*95%*	*93%*	*95%*	*93%*	*96%*	*93%*	*83%*	*6%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments: # Percent recovery not available due to significant background levels of analyte in sample.

E013.2: 8-10g soil extracted with 20ml hexane/acetone (1:1). Analysis by GC/dual ECD.

Laboratory Identification			20339s	lcs	mb							
Sample Identification			QC	QC	QC							
Depth (m)			--	--	--							
Sampling Date recorded on COC			--	--	--							
Laboratory Extraction (Preparation) Date			28/5/05	28/5/05	28/5/05							
Laboratory Analysis Date			31/5/05	30/5/05	30/5/05							
Method	**Organochlorine Pesticides (OC)**	**EQL**										
E013.2	a-BHC	0.05	97%	107%	<0.05							
	HCB	0.05	--	118%	<0.05							
	b-BHC	0.05	97%	102%	<0.05							
	g-BHC (Lindane)	0.05	96%	105%	<0.05							
	d-BHC	0.05	101%	98%	<0.05							
	Heptachlor	0.05	87%	105%	<0.05							
	Aldrin	0.05	100%	104%	<0.05							
	Heptachlor epoxide	0.05	102%	106%	<0.05							
	trans-chlordane	0.05	102%	107%	<0.05							
	Endosulfan I	0.05	102%	107%	<0.05							
	cis-chlordane	0.05	100%	105%	<0.05							
	Dieldrin	0.05	99%	104%	<0.05							
	4,4-DDE	0.05	#	105%	<0.05							
	Endrin	0.05	103%	113%	<0.05							
	Endosulfan II	0.05	105%	108%	<0.05							
	4,4-DDD	0.05	117%	100%	<0.05							
	Endosulfan sulphate	0.05	94%	108%	<0.05							
	4,4-DDT	0.2	75%	103%	<0.2							
	Methoxychlor	0.2	100%	111%	<0.2							
	DBC (Surr @ 0.2mg/kg)	--	*86%*	*100%*	*113%*							

Results expressed in mg/kg dry weight unless otherwise specified

Comments: # Percent recovery not available due to significant background levels of analyte in sample.

E013.2: 8-10g soil extracted with 20ml hexane/acetone (1:1). Analysis by GC/dual ECD.

Laboratory Identification			20338	20339	20340	20341	20342	20343	20344	20345	20338d	20338r
Sample Identification			0513GSA	0513GSB	0513GSC	0513GSD	0513GSE	0513GSF	0513GSG	0513GSH	QC	QC
Depth (m)			0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	--	--
Sampling Date recorded on COC			31/3/05	31/3/05	31/3/05	31/3/05	31/3/05	31/3/05	31/3/05	31/3/05	--	--
Laboratory Extraction (Preparation) Date			28/5/05	28/5/05	28/5/05	28/5/05	28/5/05	28/5/05	28/5/05	28/5/05	28/5/05	--
Laboratory Analysis Date			30/5/05	30/5/05	30/5/05	30/5/05	30/5/05	30/5/05	30/5/05	30/5/05	30/5/05	--
Method	**Organophosphorus Pesticides**	**EQL**										
E014.2	Dichlorvos	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Mevinphos (Phosdrin)	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Demeton (total)	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	--
	Ethoprop	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Monocrotophos	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Phorate	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Dimethoate	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Diazinon	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Disulfoton	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Methyl parathion	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Ronnel	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Fenitrothion	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Malathion	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Fenthion	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Chlorpyrifos	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Parathion	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Stirofos	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Prothiofos	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Azinophos methyl	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	Coumaphos	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--
	TPP (Surr @ 2mg/kg)	--	*103%*	*99%*	*105%*	*114%*	*102%*	*104%*	*116%*	*107%*	*99%*	*4%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E014.2: 8-10g soil extracted with 20ml hexane/acetone (1:1). Analysis by GC/FPD/MS.

Laboratory Identification			20339s	lcs	mb						
Sample Identification			QC	QC	QC						
Depth (m)			--	--	--						
Sampling Date recorded on COC			--	--	--						
Laboratory Extraction (Preparation) Date			28/5/05	28/5/05	28/5/05						
Laboratory Analysis Date			30/5/05	30/5/05	30/5/05						
Method	**Organophosphorus Pesticides**	**EQL**									
E014.2	Dichlorvos	0.5	104%	102%	<0.5						
	Mevinphos (Phosdrin)	0.5	--	--	<0.5						
	Demeton (total)	1	--	--	<1						
	Ethoprop	0.5	98%	91%	<0.5						
	Monocrotophos	0.5	102%	94%	<0.5						
	Phorate	0.5	100%	92%	<0.5						
	Dimethoate	0.5	109%	94%	<0.5						
	Diazinon	0.5	102%	93%	<0.5						
	Disulfoton	0.5	101%	95%	<0.5						
	Methyl parathion	0.5	99%	89%	<0.5						
	Ronnel	0.5	89%	87%	<0.5						
	Fenitrothion	0.5	104%	102%	<0.5						
	Malathion	0.5	86%	77%	<0.5						
	Fenthion	0.5	106%	98%	<0.5						
	Chlorpyrifos	0.5	101%	96%	<0.5						
	Parathion	0.5	101%	96%	<0.5						
	Stirofos	0.5	102%	95%	<0.5						
	Prothiofos	0.5	107%	103%	<0.5						
	Azinophos methyl	0.5	127%	94%	<0.5						
	Coumaphos	0.5	111%	102%	<0.5						
	TPP (Surr @ 2mg/kg)	--	*102%*	*99%*	*103%*						

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E014.2: 8-10g soil extracted with 20ml hexane/acetone (1:1). Analysis by GC/FPD/MS.

Laboratory Identification			20334	20335	20336	20337	20338	20339	20340	20341	20342	20343
Sample Identification			0512GS-01	0512GS-14	0521DW-05	052975-01	0513GSA	0513GSB	0513GSC	0513GSD	0513GSE	0513GSF
Depth (m)			2.6	2.6	1.8	--	0.15	0.15	0.15	0.15	0.15	0.15
Sampling Date recorded on COC			24/3/05	24/3/05	21/5/05	23/5/05	31/3/05	31/3/05	31/3/05	31/3/05	31/3/05	31/3/05
Laboratory Extraction (Preparation) Date			1/6/05	1/6/05	16/6/05	1/6/05	1/6/05	1/6/05	1/6/05	1/6/05	1/6/05	1/6/05
Laboratory Analysis Date			1/6/05	1/6/05	19/6/05	1/6/05	2/6/05	2/6/05	2/6/05	1/6/05	1/6/05	1/6/05
Method	**Acid extractable metals (M7)**	**EQL**										
E022.2	Arsenic	1	1	<1	2	5	1	<1	<1	2	<1	<1
	Cadmium	0.1	<0.1	<0.1	0.1	0.9	0.1	0.1	0.2	0.1	0.1	0.1
	Chromium	1	6	8	15	54200	13	7	8	11	16	16
	Copper	2	5	5	11	12000	88	66	99	88	49	55
	Nickel	1	7	10	3	37	3	2	3	3	6	4
	Lead	2	8	11	15	64	10	9	10	12	9	8
	Zinc	5	7	35	49	2770	13	10	15	15	10	11

Results expressed in mg/kg dry weight unless otherwise specified

Comments: # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification			20344	20345	20338d	20338r	20345d	20345r	20339s	crm	crm	lcs
Sample Identification			0513GSG	0513GSH	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)			0.15	0.15	--	--	--	--	--	--	--	--
Sampling Date recorded on COC			31/3/05	31/3/05	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date			1/6/05	1/6/05	1/6/05	--	1/6/05	--	1/6/05	1/6/05	16/6/05	1/6/05
Laboratory Analysis Date			1/6/05	1/6/05	2/6/05	--	1/6/05	--	2/6/05	1/6/05	17/6/05	1/6/05
Method	**Acid extractable metals (M7)**	**EQL**										
E022.2	Arsenic	1	<1	<1	1	0%	<1	--	80%	109%	94%	107%
	Cadmium	0.1	0.1	<0.1	0.1	0.0%	<0.1	--	93%	91%	92%	93%
	Chromium	1	7	6	11	17%	5	18%	73%	91%	92%	101%
	Copper	2	46	43	91	3%	45	5%	#	96%	90%	103%
	Nickel	1	5	2	3	0%	1	67%	78%	92%	84%	104%
	Lead	2	10	7	10	0%	7	0%	95%	101%	93%	100%
	Zinc	5	18	9	13	0%	8	12%	80%	87%	83%	101%

Results expressed in mg/kg dry weight unless otherwise specified

Comments: # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification			lcs	mb	mb							
Sample Identification			QC	QC	QC							
Depth (m)			--	--	--							
Sampling Date recorded on COC			--	--	--							
Laboratory Extraction (Preparation) Date			16/6/05	1/6/05	16/6/05							
Laboratory Analysis Date			17/6/05	1/6/05	17/6/05							
Method	**Acid extractable metals (M7)**	**EQL**										
E022.2	Arsenic	1	94%	<1	<1							
	Cadmium	0.1	102%	<0.1	<0.1							
	Chromium	1	102%	<1	<1							
	Copper	2	92%	<2	<2							
	Nickel	1	93%	<1	<1							
	Lead	2	94%	<2	<2							
	Zinc	5	103%	<5	<5							

Results expressed in mg/kg dry weight unless otherwise specified

Comments: # Percent recovery not available due to significant background levels of analyte in sample.

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification			20334	20335	20336	20337	20338	20339	20340	20341	20342	20343
Sample Identification			0512GS-01	0512GS-14	0521DW-05	052975-01	0513GSA	0513GSB	0513GSC	0513GSD	0513GSE	0513GSF
Depth (m)			2.6	2.6	1.8	--	0.15	0.15	0.15	0.15	0.15	0.15
Sampling Date recorded on COC			24/3/05	24/3/05	21/5/05	23/5/05	31/3/05	31/3/05	31/3/05	31/3/05	31/3/05	31/3/05
Laboratory Extraction (Preparation) Date			1/6/05	1/6/05	16/6/05	1/6/05	1/6/05	1/6/05	1/6/05	1/6/05	1/6/05	1/6/05
Laboratory Analysis Date			1/6/05	1/6/05	17/6/05	2/6/05	2/6/05	2/6/05	2/6/05	1/6/05	1/6/05	1/6/05
Method	**Acid extractable mercury**	**EQL**										
E026.2	Mercury	0.05	<0.05	<0.05	0.10	*<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results expressed in mg/kg dry weight unless otherwise specified

Comments: *EQL increased due to matrix interference.

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification			20344	20345	20338d	20338r	20345d	20345r	20339s	crm	crm	lcs
Sample Identification			0513GSG	0513GSH	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)			0.15	0.15	--	--	--	--	--	--	--	--
Sampling Date recorded on COC			31/3/05	31/3/05	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date			1/6/05	1/6/05	1/6/05	--	1/6/05	--	1/6/05	1/6/05	16/6/05	1/6/05
Laboratory Analysis Date			1/6/05	1/6/05	2/6/05	--	1/6/05	--	2/6/05	1/6/05	16/6/05	1/6/05
Method	**Acid extractable mercury**	**EQL**										
E026.2	Mercury	0.05	<0.05	<0.05	<0.05	--	<0.05	--	98%	102%	121%	88%

Results expressed in mg/kg dry weight unless otherwise.specified

Comments: *EQL increased due to matrix interference.

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification			lcs	mb	mb							
Sample Identification			QC	QC	QC							
Depth (m)			--	--	--							
Sampling Date recorded on COC			--	--	--							
Laboratory Extraction (Preparation) Date			16/6/05	1/6/05	16/6/05							
Laboratory Analysis Date			16/6/05	1/6/05	16/6/05							
Method	**Acid extractable mercury**	**EQL**										
E026.2	Mercury	0.05	99%	<0.05	<0.05							

Results expressed in mg/kg dry weight unless otherwise specified

Comments: *EQL increased due to matrix interference.

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification			20320	20321	20322	20323	20324	20325	20326	20327	20328	20329
Sample Identification			0507RD01	0507RD02	0507RD03	0507RD04	0507RD05	0507RD06	0507RD07	0523RD01	0523RD02	0523RD03
Depth (m)			--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC			31/1/05	31/1/05	31/1/05	31/1/05	31/1/05	31/1/05	31/1/05	4/5/05	4/5/05	4/5/05
Laboratory Extraction (Preparation) Date			27/5/05	27/5/05	27/5/05	27/5/05	27/5/05	27/5/05	27/5/05	27/5/05	27/5/05	27/5/05
Laboratory Analysis Date			30/5/05	30/5/05	30/5/05	30/5/05	30/5/05	30/5/05	30/5/05	30/5/05	30/5/05	30/5/05
Method	**Filtered mercury**	**EQL**										
E026.1	Mercury	0.1	<0.1	1.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.5	1

Results expressed in ug/l unless otherwise specified

Comments:

E026.1: Analysis by CV-ICP-MS or FIMS following BrCl pre-treatment.

Laboratory Identification			20330	20331	20332	20333	20320d	20320r	20330d	20330r	20321s	lcs
Sample Identification			0523RD04	0523RD05	0523RD06	0523RD07	QC	QC	QC	QC	QC	QC
Depth (m)			--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC			4/5/05	4/5/05	4/5/05	4/5/05	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date			27/5/05	27/5/05	27/5/05	27/5/05	27/5/05	--	27/5/05	--	27/5/05	27/5/05
Laboratory Analysis Date			30/5/05	30/5/05	30/5/05	30/5/05	30/5/05	--	30/5/05	--	30/5/05	30/5/05
Method	**Filtered mercury**	**EQL**										
E026.1	Mercury	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	--	97%	89%

Results expressed in ug/l unless otherwise specified

Comments:

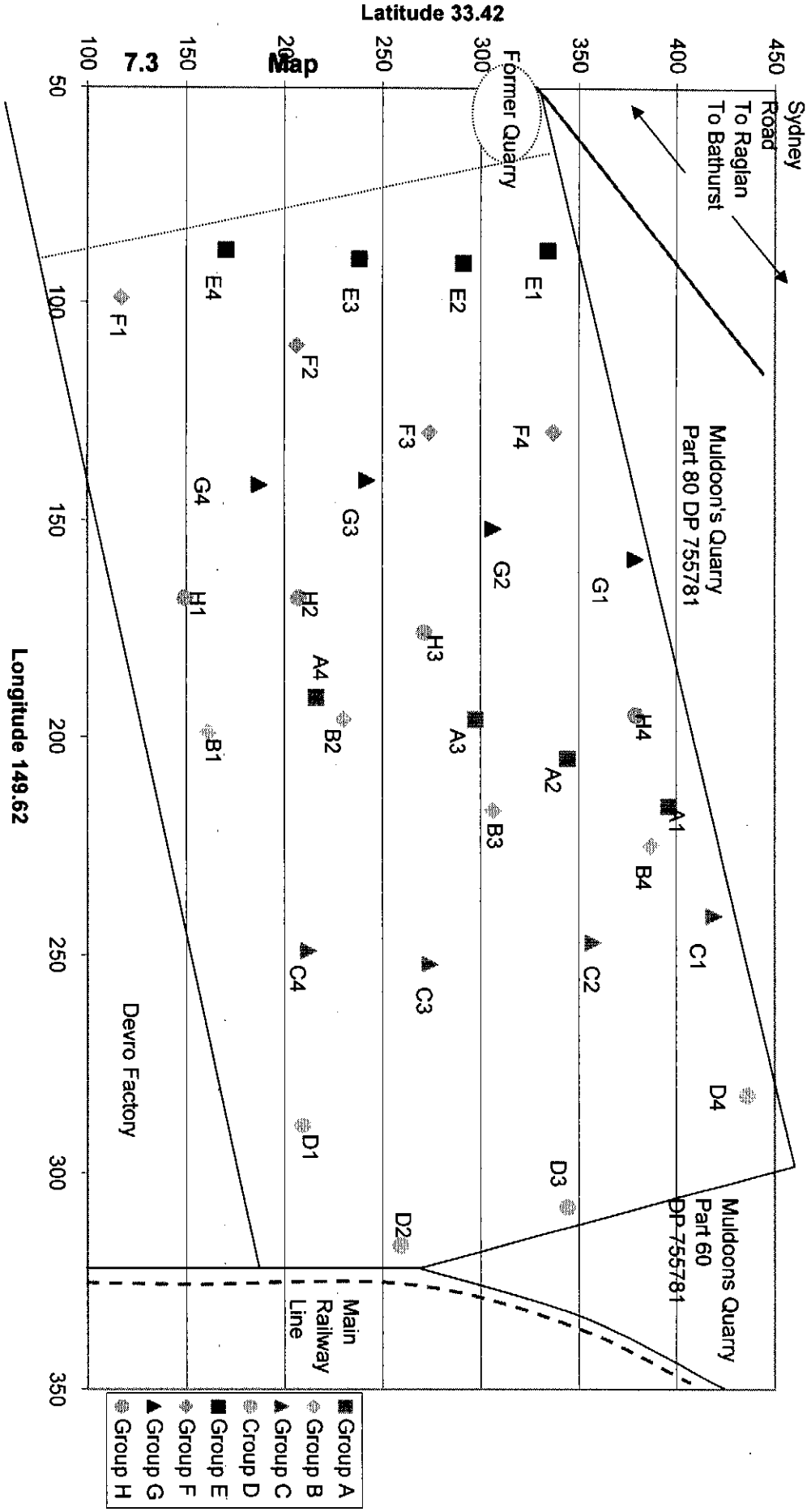
E026.1: Analysis by CV-ICP-MS or FIMS following BrCl pre-treatment.

Envirotech
central west

Grade	Type	mm	% Clay	Factor
S	sand	nil	<5	22.7
LS	loamy sand	5	5	22.7
SC	clayey sand	5-15	5-10	22.7
SL	sandy loam	15-25	10-20	13.8
L	Loam	25	25	9.5
SCL	sandy clay loam	25-40	20-30	9.5
CL	clay loam	40-50	30-35	8.6
CLS	clay loam sandy	40-50	30-35	8.6
LC	light clay	50-75	35-40	8.6
LMC	light medium clay	75	40-45	7.5
MC	medium clay	>75	45-55	5.8
HC	heavy clay	>75	50	5.8

7.2 Field GPS and Physicochemical Data

Job	Hole	Depth Interval (m)		Colour			% Coarse Sand	Texture			EC	ECe	pH
				Munsel	Description	Mottle		mm	Type	Factor	uS/cm	dS/m	
1	A1	0	0.1	10YR3/3	DARK BROWN	Nil	10	10-15	CS	22.7	58.5	1.33	6.34
11	D4	0	0.1	10YR3/3	DARK BROWN	Nil	10	10	CS	22.7	35.4	0.80	6.25
10	D4	0.1	0.2	7.5YR4/4	BROWN	Nil	20	20	CS	22.7	33.8	0.77	5.97
12	E1	0	0.15	10YR3/3	DARK BROWN	Nil	10	10	CS	22.7	30.9	0.70	6.13
21	G1	0.2	0.3	10YR3/3	DARK BROWN	Nil	5	10	CS	22.7	40.9	0.93	5.68
23	H4	0	0.2	10YR3/6	DARK YELLOWISH BROWN	Nil	5	20	CS	22.8	20.8	0.47	5.65
4	C1	0	0.1	10YR3/4	DARK YELLOWISH BROWN	Nil	5	10-15	LS	22.7	35.0	0.79	6.11
6	D1	0	0.1	10YR3/3	DARK BROWN	Nil	20	15	LS	22.7	84.3	1.91	6.43
8	D1	0.1	0.2	7.5YR4/4	BROWN	Nil	5	20	SL	13.8	17.9	0.25	6.24
20	G1	0.1	0.2	10YR3/3	DARK BROWN	Nil	5	15	SL	22.7	[illegible]	[illegible]	6.39
2	A1	0.1	0.3	7.5YR5/4	BROWN	Nil	10	40	SCL	9.5	16.3	0.15	6.37
5	C1	0.2	0.3	7.5YR4/4	BROWN	Nil	10	40	SCL	9.5	22.3	0.21	6.25
9	D4	0.2	0.3	7.5YR4/6	STRONG BROWN	Nil	10	40-50	SCL	8.6	54.2	0.47	5.80
14	E1	0.2	0.3	10YR4/3	BROWN	Nil	10	15-25	SCL	13.8	29.1	0.40	5.81
17	F2	0	0.2	10YR3/4	DARK YELLOWISH BROWN	Nil	5	30	SCL	9.5	26.9	0.26	6.56
19	H2	0	0.25	10YR4/3	BROWN	Nil	5	20-25	SCL	9.5	24.6	0.23	6.32
22	H4	0.2	0.3	10YR5/3	BROWN	Nil	5	25-35	SCL	13.8	16.9	0.23	6.07
15	F1	0	0.1	2.5YR3/4	DARK REDDISH BROWN	Nil	10	50	LC	8.6	26.5	0.23	6.43
24	H1	0.4	0.5	2.5YR3/4	DARK REDDISH BROWN	Nil	5	70	LC	5.8	28.0	0.16	6.06
13	E1	0.4	0.5	5YR4/4	REDDISH BROWN	Nil	5	70	MC	5.8	40.3	0.23	6.90
3	A2	0.2	0.3	2.5YR3/6	DARK RED	Nil	5	85	HC	5.8	25.2	0.15	6.25
7	D4	0.4	0.5	7.5YR4/6	STRONG BROWN	Nil	5	85	HC	5.8	26.4	0.15	6.37
16	F4	0.4	0.5	10YR5/6,5/1	YELLOWISH BROWN AND DARK GREY		5	75	HC	5.8	[illegible]	0.82	8.18
18	G1	0.4	0.5	2.5YR4/4	REDDISH BROWN	Nil	5	V.FIRM	HC	5.8	39.3	0.23	6.68


Reedy Orchard DP 164151 (9.55 Ha)
Latitude 33.42
Longitude 149.62
Map 7.3
Sydney Road
To Raglan
To Bathurst
Former Quarry
Muldoon's Quarry
Part 80 DP 755781
Muldoons Quarry
Part 60
DP 755781
Devro Factory
Main Railway Line
E1
E2
E3
E4
F1
F2
F3
F4
G1
G2
G3
G4
H1
H2
H3
H4
A1
A2
A3
A4
B1
B2
B3
B4
C1
C2
C3
C4
D1
D2
D3
D4
Group A
Group B
Group C
Croup D
Group E
Group F
Group G
Group H

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	A1

Location Description

east side of orchard slightly south of midline

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42216	149.62396	691

	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	
0.1	Dark brown Fine Sandy Loam			0.1
0.2	Orange and dull grey loam			0.2
0.3	Weathered granite -dusty orange			0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Skeleton Weed, Pattersons Curse, Wild Turnip

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	A2

Location Description

centre east, slightly south - top of ridge

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42205	149.62344	695.4

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Sandy Loam			0.1
0.2	Brownish Red Sandy Clay Loam			0.2
0.3	Weathered granite, heavy red clay coarse grained silica sand			0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Plaintain 50%, wild turnip 30%, couch and panic grass 20%

Shallow soil profile to weathered granite

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	A3

Location Description

central, top of ridge,

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42196	149.62297	697.4

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Sandy Loam			0.1
0.2	Hard agglomerated clay loam/weathered granite			0.2
0.3	Weathered red and white granite			0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

skeleton weed

red soil, granite at 0.2 m

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	A4

Location Description: Central north west

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42191	149.62216	697.4

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Sandy Loam			0.1
0.2	Dark brown Sandy Clay Loam			0.2
0.3	Red Heavy Clay with Weathered granite			0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

skeleton weed, wild turnip

weathered granite at 0.3m+

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	B1

Location Description

Central west side of orchard

GPS	Lattitude or Northing	Longitude or Easting	Altitude (m)
	33.42199	149.62161	697.4

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Fine Sandy Clay Loam			0.1
0.2	Brown Sandy Clay Loam			0.2
0.3	Hard Brown Sandy Clay			0.3
0.4	Brown Sandy Clay Loam and Weathered Granite Red Weathered Granite, Heavy Clay with Brown Mottle			0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Skeleton weed 15%, wild turnip 70%, Phalris 5%, Plantain 10%

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	B2

Location Description

Central west side of orchard

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42096	149.62230	697.4

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Sandy Loam - Hard Setting			0.1
0.2	Dark Reddish BrownHeavy Clay/Weathered Granite			0.2
0.3	Moist at 0.3 m			0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Skeleton Weed, Wild Turnip, Patterson's Curse

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	B3

Location Description

Central west side of orchard

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42217	149.62306	701.3

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dull Yellowish Brown Clay Loam			0.1
0.2	Ochre Heavy Clay overlying Weathered Granite			0.2
0.3				0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Skeleton Weed, Wild Turnip, Patterson's Curse

soloth soil

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	B4

Location Description: South east side of orchard

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42225	149.62387	701.3

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Medium Brown hards sandy clay loam			0.1
0.2	Dull Brown and Ochre Hard Clay Weathered Granite			0.2
0.3				0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations: Skeleton Weed, Wild Turnip, Patterson's Curse

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	C1

Location Description

South east side of orchard

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42241	149.62419	702

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Fine Sandy Clay Loam - Hard setting			0.1
0.2	Bleached Brown Sandy Clay Loam Hard Setting			0.2
0.3				0.3
0.4	Bleached Ochre Sandy Clay Loam Hard setting powdery over weathered granite			0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Wild turnip 80%, Phalaris 5%, Skeleton Weed 5%Couch 5% Bromus 5%

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	B2

Location Description

Central west side of orchard

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42096	149.62230	697.4

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Sandy Loam - Hard Setting			0.1
0.2	Dark Reddish BrownHeavy Clay/Weathered Granite			0.2
0.3	Moist at 0.3 m			0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Skeleton Weed, Wild Turnip, Patterson's Curse

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	B3

Location Description

Central west side of orchard

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42217	149.62306	701.3

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dull Yellowish Brown Clay Loam			0.1
0.2	Ochre Heavy Clay overlying Weathered Granite			0.2
0.3				0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Skeleton Weed, Wild Turnip, Patterson's Curse

soloth soil

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	B4

Location Description

South east side of orchard

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42225	149.62387	701.3

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Medium Brown hards sandy clay loam			0.1
0.2	Dull Brown and Ochre Hard Clay Weathered Granite			0.2
0.3				0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Skeleton Weed, Wild Turnip, Patterson's Curse

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	C1

Location Description

South east side of orchard

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42241	149.62419	702

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Fine Sandy Clay Loam - Hard setting			0.1
0.2	Bleached Brown Sandy Clay Loam Hard Setting			0.2
0.3				0.3
0.4	Bleached Ochre Sandy Clay Loam Hard setting powdery over weathered granite			0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Wild turnip 80%, Phalaris 5%, Skeleton Weed 5%Couch 5% Bromus 5%

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	C2

Location Description

South east side

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42247	149.62357	703

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Medium Brown Fine Sandy Clay Loam			0.1
0.2	Brown Hard setting Sandy Clay Loam			0.2
0.3	Red Heavy Clay over Weathered Granite			0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Wild turnip 80%, Skeleton Weed 15% Bromus 5%

Red weathered granite at 0.2 m

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	C3

Location Description

South central west side - gully

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42252	149.62274	694.7

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Grey Brown Sandy Clay Loam			0.1
0.2	Brown Hard setting Sandy Clay Loam			0.2
0.3	Weathered granite			0.3
0.4	Large quartz granules - coarse sand - sandy clay			0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Skeleton Weed , Wild Turnip, "Bottle washers"

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	C4

Location Description

Sothwest side

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42249	149.62212	700.1

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Fine Sandy Clay Loam			0.1
0.2	Hard Setting Dull Brown Sandy Clay Loam /Weathered granite			0.2
0.3	Sandy Clay/Weathered Granite			0.3
0.4	Ochre Sandy Clay, Weathered Granite			0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Skeleton Weed 10%, Wild Turnip 80% Dock 2% Couch and Kikuyu 8%

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	D1

Location Description

Opposite Devo aerobic Ponds - South west side

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42289	149.62209	702.2

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Fine Sandy Clay Loam			0.1
0.2	Hard Setting Dull Brown Sandy Clay Loam /Weathered granite			0.2
0.3	Red Weathered Granite			0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Skeleton Weed 10%, Wild Turnip 80% Dock 2% Couch and Kikuyu 8%

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	D2

Location Description

South side near railway line

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42317	149.62259	702.2

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Fine Sandy Clay Loam			0.1
0.2	Dull Brown Sandy Clay Loam with some Weathered Granite			0.2
0.3	Reddish Brown Heavy Clay and Weathered Granite Coarse granules			0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Skeleton Weed 50%, Wild turnip 20% Danthonia 30%

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	D3

Location Description: Sothside near Part 60 DP 755781

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42308	149.62344	702.2

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Very Dark Brown Sandy Loam			0.1
0.2	Dull Brown Bleached Sandy Clay Loam			0.2
0.3	Ochre Weathered Granite			0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Patterson Curse 25% Wild Turnip 25% Bromus 25% Skeleton Weed 25%

ochres, dusty purple above weathered granite

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	D4

Location Description

Sothside near Part 60 DP 755781

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42282	149.62436	702.2

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Fine Sandy Loam			0.1
0.2	Medium Brown Fine Sandy Clay Loam			0.2
0.3	Red Brown Sandy Clay Loam			0.3
0.4	Red Clay with large coarse silica granules			0.4
0.5	Red Clay /Weathered granite granules			0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Bromus 40%, Wild Turnip 20%, Skeleton Weed 20%

Hand augered

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	E1

Location Description

Sothside near Part 60 DP 755781

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42088	149.62334	694

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Sandy Loam			0.1
0.2				0.2
0.3	Brown Clay Loam and Weathered Granite			0.3
0.4	Dark Brown Sandy Clay with Red Mottles			0.4
0.5	Red Clay /Weathered granite granules			0.5
0.6	Weathered Granite			0.6
0.7				0.7
0.8				0.8

General Observations

Wild turnip, panicum, feathertop -Danthonia

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	E2

Location Description

North east near Residences

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42091	149.62291	700

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Very Dark Brown Sandy Loam			0.1
0.2				0.2
0.3	Brown Clay Loam			0.3
0.4				0.4
0.5				0.5
0.6				0.6
0.7	Red and Grey Heavy Clay			0.7
4.0				4.0

General Observations

Feathertop, panicum

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	E3

Location Description

North central - Gully

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.4209	149.62238	700

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Coarse Sandy Loam			0.1
0.2	Brown Sandy Clay Loam			0.2
0.3	Dark Brown Heavy Clay over Weathered Granite			0.3
0.4	Weathered Granite			0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Bromus 40%, Wild Turnip 20%, Skeleton Weed 20%

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	E4

Location Description

Sothside near Part 60 DP 755781

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42088	149.62170	700

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Sandy Loam			0.1
0.2	Brown Sandy Clay Loam			0.2
0.3	Heavy Clay/Weathered Granite, Coarse Sandy Clay			0.3
0.4				0.4
0.5				0.5
0.6				0.6
3.5				3.5
4.0				4.0

General Observations

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	F1

Location Description: North West Corner

GPS	Lattitude or Northing	Longitude or Easting	Altitude (m)
	33.42099	149.62117	698

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Sandy Loam			0.1
0.2	Brown Clay Loam			0.2
0.3	Red Weathered Granite			0.3
0.4				0.4
0.5				0.5
0.6				0.6
0.7				0.7
4.0				4.0

General Observations

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	F2

Location Description: North east near Residences

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.4211	149.62206	700

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Sandy Loam			0.1
0.2	Brown Clay Loam			0.2
0.3	Heavy Brown Clay - Weathered Granite			0.3
0.4				0.4
0.5				0.5
0.6				0.6
0.7				0.7
4.0				4.0

General Observations: Danthonia, Wild Turnip and Skeleton Weed

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	F3

Location Description

Central North East side

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42130	149.62276	700

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Sandy Loam			0.1
0.2	Brown Sandy Clay Loam			0.2
0.3				0.3
0.4	Bronze Weathered Granite			0.4
0.5				0.5
0.6				0.6
0.7				0.7
4.0				4.0

General Observations

Wild Turnip, Plantain, Patterson's Curse

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	F4

Location Description

North east side

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.4213	149.62337	699

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dull Brown hard setting Sandy Loam			0.1
0.2				0.2
0.3	Brown Clay Loam			0.3
0.4				0.4
0.5	Ochre Heavy Clay with Manganese Nodules, Moist			0.5
0.6	Yellow Ochre Weathered Granite			0.6
0.7				0.7
4.0				4.0

General Observations

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	G1

Location Description

Centralk East Side near Part 80 DP 755781

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42156	149.62379	700

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Fine Sandy Loam			0.1
0.2	Brown Clay Loam			0.2
0.3	Reddish Brown Heavy Clay			0.3
0.4				0.4
0.5	Bronze Weathered Granite			0.5
0.6				0.6
0.7				0.7
4.0				4.0

General Observations

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	G2

Location Description: Central North East

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42152	149.62306	699

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Sandy Loam			0.1
0.2	Brown Clay Loam			0.2
0.3	Red Sandy Clay			0.3
0.4	Weathered Granite			0.4
0.5				0.5
0.6				0.6
0.7				0.7
4.0				4.0

General Observations: Feathertop, panicum

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	G3

Location Description: Central North West - Hollow with 3 pear trees

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42144	149.62242	699

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Sandy Loam			0.1
0.2	Dark Brown Heavy Clay over Weathered Granite			0.2
0.3	Red and Brown Weathered Granite - Dusty			0.3
0.4				0.4
0.5				0.5
0.6				0.6
0.7				0.7
4.0				4.0

General Observations

80% Bromus grass, 3 Pear Trees

Soloth soil

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	G4

Location Description: North West Side

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42142	149.62187	700

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Fine Sandy Clay Loam			0.1
0.2	granules			0.2
0.3	Red Heavy Clay/ Weathered Granite			0.3
0.4	Red and Bronze weathered Granite			0.4
0.5				0.5
0.6				0.6
0.7				0.7
4.0				4.0

General Observations

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	H1

Location Description: Central North West Side

GPS	Lattitude or Northing	Longitude or Easting	Altitude (m)
	33.42167	149.62149	695

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Brown Sandy Loam			0.1
0.2	Red Heavy Clay			0.2
0.3	Red weathered Granite MOIST			0.3
0.4				0.4
0.5				0.5
0.6				0.6
0.7				0.7
4.0				4.0

General Observations

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	H2

Location Description

Central North West - ridge top

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42168	149.62207	694

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Brown Fine Sandy Loam			0.1
0.2	Reddish Brown Heavy Clay and Golden and Red Weathered Granite			0.2
0.3				0.3
0.4				0.4
0.5	Bronze and red weathered Granite			0.5
0.6				0.6
0.7				0.7
4.0				4.0

General Observations

Very Little Topsoil

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	H3

Location Description: Central North

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42176	149.62271	700

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Dark Brown Sandy Clay Loam			0.1
0.2	Reddish Brown Clay Loam			0.2
0.3	Red Heavy Clay and Weathered Granite			0.3
	Excavator hit 0.075 m diam white pressure pipe			
0.4	Water was pH 6.3, EC 312 uS/cm			0.4
0.5				0.5
0.6				0.6
0.7	Red and Grey Heavy Clay			0.7
4.0				4.0

General Observations

Wild turnip, skeleton Weed

Plumber turne water off at main next to residence on Sydney Road at 14:45

Envirotech
central west

Site Investigation Log

KELSO NSW

Reedy's Orchard

Job	Date	Test Pit/Bore ID
0513GS	31-Mar-05	H4

Location Description: Central East Side

GPS	Latitude or Northing	Longitude or Easting	Altitude (m)
	33.42195	149.62379	699

m	Texture, colour, aggregate (% & mm), moisture (d, m,w)	PID (ppm IBE)	Sample Code	m
0.1	Medium Brown Sandy Loam			0.1
0.2	Bleached Brown Clay Loam Soloth Powdery with some Fe-Mn Nodules			0.2
0.3				0.3
0.4				0.4
0.5				0.5
0.6				0.6
0.7				0.7
4.0				4.0

General Observations

Soft Brome, Wuild Turnip 70%, Love grass 15%

Pale bleached dull brown soil