coffey environments
SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

5 July 2010

Department of Planning and Community Development
GPO Box 2392
Melbourne Victoria 3001

Attention: Libby Sampson

RE: Summary Advice in relation to Contamination Assessment and Remediation at the Werribee Employment Precinct

1 INTRODUCTION

Coffey Environments Australia Pty Ltd is pleased to provide this high level advice on potential contamination assessment and remediation for the Werribee Employment Precinct. The precinct is covers an area of 914.84 hectares and is located south of Princes Highway and west of Hacketts Road, Werribee.

We understand that the purpose of the advice is to give context to the potential contamination issues at the precinct and to provide indicative estimates of potential costs for assessment and remediation of various issues across the precinct.

Site information for the advice has been based on reports provided to Coffey by DPCD, which include:

- GeoAust, 2009, Preliminary Geotechnical Assessment, Werribee Employment Precinct, prepared for Vicurban;
- David Lock Associates, 2009, Werribee Employment Precinct, A New Vision;
- Compass Environmental, 2009, Phase 1 Environmental Site Assessment, Werribee Employment Precinct, prepared for Vicurban; and
- DPI advice on possible contaminated areas, Plan showing 'Possible Contaminated Areas'.

2 SITE INFORMATION

For the purpose of this advice, the precinct has been described in zones. The zones have been selected based on current physical features and conceptual future landuse. The transport easement through the centre of the precinct (Princes Freeway) has not been considered. The zones are shown in Figure 1 and are described below.

City Zone (1) and drainage reserve

- Western part of precinct;
- Area of 185.37 hectares plus approximately 31 hectares drainage reserve along northern boundary;
- Commercial and residential uses (including primary school);
- Anticipate high density commercial and residential in the north of the zone and low density residential in the south of the zone.

University Medical Core (2)

- Northern central part of precinct;
- Area of 171.08 hectares;
- Anticipate commercial, educational and research landuses.

Point Cook Neighbourhoods (3)

- North eastern part of precinct;
- Area of 133.6 hectares;
- Anticipate predominantly low density residential landuse (including primary school and open space);

City Extension (4)

- Central part of precinct;
- Area of 73.40 hectares;
- Anticipate open space, commercial and urban use.

Interim Enterprise (5) and Regional Sporting Facility

- Southern part of precinct;
- Area of 218.56 hectares ;
- “Interim use”, anticipated to include commercial, agricultural and light industrial.
- Anticipate north east corner of zone to include open space and primary school.

2.1 Potential for a Statutory Environmental Audit to be required

The anticipated landuses in the City (1) and Point Cook Neighbourhoods (3) zones are predominantly considered to be sensitive uses, which are likely to trigger a requirement for a Statutory Environmental Audit, by the planning authority, given the likely perception that there may be some contamination issues associated with the site. Individual sites or smaller blocks within the other zones may also trigger a statutory environmental audit.

It is noted that farming and research use is not considered, prima facie, to be a potentially contaminating use, under Ministers Direction No.1 (pursuant to the planning and Environment Act 1987). However, given the various activities that are understood to have been conducted on at least parts of the overall site, it is a reasonable expectation that the site would be considered by the planning authority to be potentially contaminated, in the absence of direct information to the contrary. An Environmental Audit Overlay (EAO) has not been applied to this site. It is possible that a submission to the planning authority (Wyndham City Council), providing direct evidence that zones or parts of zones are not contaminated, may provide the necessary degree of information to have the site considered not to be "potentially contaminated", and therefore avoid the requirement for an environmental audit. The evidence would most likely involve an environmental site assessment and would need to provide sufficient confidence that significant contamination had not been missed. Once an EAO is applied to a site, only a full planning scheme amendment or intervention by the Environment Minister could remove the requirement for an environmental audit.

Statutory environmental audits can only be conducted within the requirements of Section Part IXD of the Environment Protection Act, by persons appointed as environmental auditors under Section 53S(1) of the Act. The process is regulated by EPA Victoria, which has produced a series of guidance documents on the appropriate levels of site assessment and responsibilities of auditors in conducting statutory audits. A requirement for an environmental audit usually results in the need for a higher degree of site assessment and remediation effort, than in circumstances where an audit is not required.

3 LIKELIHOOD OF CONTAMINATION

Tables 1 to 5 summarise the areas of potential concern (APECs) identified by Compass (2009) and provide an inferred likelihood of contamination for each APEC within each zone. This review is limited to the information provided in existing reports. The interpretation of likelihood has been based on experience at other sites. Intrusive site assessment has not been conducted and additional areas of concern and contamination issues may be encountered during assessment. It is also possible that intrusive sampling could prove that possible issues, as identified, in fact do not exist.

Figure 1 shows the extent of the precinct and the location of the zones.

Figures 2 to 7 show the APECs that relate to specific known parts of the zones.

Table 1. Summary of Areas of Potential Environmental Concern – City Zone (1)

APEC	Description	Implication	Likelihood
Old farm buildings	Former underground storage tanks (USTs) (many reportedly removed) around the old farm building.	Leaks and spills around underground storage tanks may have contaminated soils and groundwater in the vicinity of the tanks.	High
	Former heating oil tank. Storage of drums and batteries. Storage and servicing of equipment. Furnace room, blacksmith and forge. Paint spraying room. Triple interceptor trap.	Spills from above ground tanks, fuel stored in drums and during equipment maintenance may have contaminated soils. Poor disposal of ash may have contaminated surface soils. Runoff or leaks from drains may have contaminated surrounding soils and potentially groundwater.	Moderate Low High
Filling of soils	Various locations around the zone have received imported fill during development or have stockpiled soil. Large stockpiles are evident along the south western boundary of the zone.	Imported fill may contain contamination from the source of the fill or may contain wastes that are aesthetically or geotechnically unsuitable for development.	Moderate
Boiler, incinerator	A boiler room was formerly present north of the old farm buildings. An incinerator is present north west of the old farm buildings. An incinerator is present in the area of the piggery. An incinerator is present at the CSIRO Animal Health Science centre. Incinerator room in State Chem Labs.	Fuel spills or poor disposal of ash from the boiler room or incinerator may have resulted in contamination of soils.	Moderate.
Waste burial	Burial of waste in shallow pits may have occurred around the area of the farm buildings. Evidence of waste burial is present north east of the old farm buildings and south of the tractor test tracks.	Buried waste presents an aesthetic hazard for development and may have introduced contaminants to the soil.	High

Table 1. Summary of Areas of Potential Environmental Concern – City Zone (1) (continued)

APEC	Description	Implication	Likelihood
Spray shed and chemical storage	A spray shed and chemical storage is present north of the old farm buildings and is understood to have been used for spraying animals. Different chemicals and larger doses may have been used at this facility than used in standard agricultural practice. Chemical storage is also likely to have occurred in other locations around the farm, including the storage and use of poisons. Evidence of chemicals storage has been reported in the poultry facility and in the New Farm compound.	Spills, excess spray and runoff may have resulted in contamination of surface soils and drains.	Moderate
Sheep dip	Sheep dip equipment near the shearing shed, off Research Close. Sheep yards in southern part of zone. Associated chemical and fuel storage.	Soaking and runoff of sheep dip chemicals may have contaminated soils. Spills and run off may have contaminated soils.	High.
Filled silt dam	A large dam (approximately 100 m x 50 m) in the northern part of the zone has been backfilled.	Sediment at the base of the former dam may have been contaminated by chemicals in runoff from the research farm. The soil used to backfill the dam may also contain contamination.	Low to Moderate
Burial of carcasses	DPI has indicated an area of approximately 0.5 ha in the north of the zone and approx 3 ha in the south or the zone that may have been used to bury carcasses in the past. Visual evidence of waste burial is present in the southern area.	Decomposed carcasses pose an aesthetic hazard to development and may have introduced contaminants and high levels of nutrients to the soil and potentially groundwater.	High
Burial of potentially radioactive carcasses	DPI has indicated historic burial of potentially radioactive carcasses in the south western portion of this zone. DPI suggests an area of approximately 1 ha. The presence or degree of radioactivity has not been assessed.	Buried waste poses an aesthetic hazard for development and may introduce chemical, biological or radioactive contamination to soil and groundwater.	High
Electrical transformers	An electrical transformer is present to the north of the old farm.	Leaking transformers can result in contamination of near surface soils with PCBs.	Low

Table 1. Summary of Areas of Potential Environmental Concern – City Zone (1) (continued)

APEC	Description	Implication	Likelihood
Septic tanks	Septic tanks are understood to have been associated with the former residential dwelling, farm manager's house and men's quarters.	Septic tank sludge presents and aesthetic hazard for development and may contain chemical or biological hazards to human health. Poorly managed septic systems can also result in contamination of groundwater.	Moderate
Effluent sumps	Effluent sumps are present at the piggery.	Leaking pits or pipework may have resulted in the contamination of surrounding soils or underlying groundwater with nutrients, cleaning chemicals or biological hazards.	Moderate
Drainage channel	A concrete lined channel runs through the site	Sediments may be contaminated and unsuitable for sensitive land use.	Moderate
Building demolition	Many buildings will require demolition prior to site development.	Older buildings can contain hazardous materials, which can contaminate soils if not properly managed.	High
Paddocks	Much of the site has been used for cropping by the research farm. Use is likely to have included irrigation (potentially with wastewater), application of fertilisers, pesticides and herbicides (potentially at levels much higher than standard agricultural use). Application rates are likely to have been highest in areas where small plots were present.	Former uses may have contaminated or otherwise affected near surface (top 0.2m) soils. Topsoil potentially unsuitable for residential or other sensitive uses.	Low to moderate
Food science Australia	Chemical use and storage. Disposal to trade waste pits and other waste sumps (potentially including photographic chemicals and acid waste). Furnace room including fuel underground storage tank (UST). Fuel storage and maintenance of equipment.	Spills and poor storage practices may have resulted in contamination of soils and potentially groundwater. Leaks from pits and sumps may have contaminated surrounding soils and underlying groundwater. Spills and leaks from USTs may have contaminated soils and groundwater. Spills and leaks from fuel stored in drums or during maintenance of equipment may have resulted in contamination of soils.	Low Moderate Moderate to High Moderate

Table 1. Summary of Areas of Potential Environmental Concern – City Zone (1) (continued)

APEC	Description	Implication	Likelihood
Potential workshops	Former mechanic's workshops have been indicated to potentially have been present: - in the Vegetable Growers Association compound, - near the former residential buildings along South Road - east of the Old Farm Buildings, and - south of the former Old Farm manager's residence.	Solvents and fuels used in a mechanics workshop may have contaminated soil and potentially groundwater.	Moderate to High
State Chemical Labs, KRC and Meat Research Centre	Chemical use and storage.	Spills and poor storage practices may have resulted in contamination of soils and potentially groundwater.	Low
	Disposal to trade waste pits and other waste sumps.	Leaks from pits and sumps may have contaminated surrounding soils and underlying groundwater.	Moderate
	Diesel generator.	Spills and leaks may have contaminated soils and groundwater with fuel.	Moderate
	Fuel storage and maintenance of equipment.	Spills and leaks from fuel stored in drums or during maintenance of equipment may have resulted in contamination of soils.	Moderate
	Radiation zone. Biohazard waste.	Spills, leaks or poor management practices may have led to contamination of soil or groundwater in these areas.	Low
	An abattoir is present in the Meat Research Centre.	Seepage and leaks from drains may have resulted in contamination of soils and potentially groundwater with nutrients, biological hazards and possibly chemicals.	Low to Moderate
Other facilities	At least 8 other facilities exist within Zone 1, which are understood to have conducted agricultural research or provide laboratory services.	Contamination of soil or groundwater may have occurred as a result of use of pesticides, herbicides, fertilisers, effluent, fuels or from poor waste disposal practices.	Low to Moderate
Dams and ponds	Four dams or ponds are present in the zone; small dams are present in the CSIRO and in the Vegetable Growers Association facilities; a small pond is present north of Sneydes Road; and a holding dam is present on the eastern edge of the CSIRO facility.	Sediments may be contaminated and unsuitable for sensitive land use or ecosystem protection.	Low to moderate

Table 2. Summary of Areas of Potential Environmental Concern – University Medical Core (2) a

APEC	Description	Implication	Likelihood
Veterinary College	Heating oil tank present and potential fuel spills.	Hydrocarbon contamination of soils and potentially groundwater.	Low
	Two trade waste pits and a grease trap are present in the college, which have historically received chemical wastes.	Potential for residual contamination around pits and where pipes may have leaked.	High
	Herbicides, pesticides and fertilisers are likely to have been used in the area, possibly at higher than normal concentrations around the animal pens.	Chemical use may have resulted in contamination of surface soils. Potential poor chemical management or disposal may have resulted in deeper contamination of soil or groundwater.	Moderate
	An incinerator is present at the college, which is understood to be used for incineration of animals.	Handling of fuels and disposal of ash may have resulted in contamination of soils.	Low
	A workshop is present.	Maintenance of vehicles and machinery may have resulted in contamination of soil and potentially groundwater through spills of fuels, solvents and oils.	Moderate
Paddocks	Majority of the site has been used for cropping by the research farm. Use is likely to have included irrigation (potentially with wastewater), application of fertilisers, pesticides and herbicides (potentially at levels much higher than standard agricultural use)	Former uses may have contaminated or otherwise affected near surface (top 0.2m) soils. Topsoil potentially unsuitable for residential or other sensitive uses.	Low to moderate
Building demolition waste	Older buildings are understood to have been demolished to allow development of the site.	Building demolition waste may have included hazardous materials (such as asbestos) which could have resulted in contamination of surface soils.	Low to moderate
Filling	Significant volumes of imported fill material around the grounds of the veterinary college. Much of the soil has reportedly come from Melbourne Uni, Parkville.	Fill may contain contaminants from source location or other waste materials contained within.	Low to moderate

Table 2. Summary of Areas of Potential Environmental Concern – University Medical Core (2) a (continued)

APEC	Description	Implication	Likelihood
Sheep yard	A sheep yard is present that may have been a holding pen for dosing and spraying.	Excess sprays/dip may have contaminated surface soils.	Moderate
Dam	A large dam (100m x 80m) is present in the northern part of the zone. The dam is likely to have received runoff from the surrounding area, which may have included chemicals.	Sediments may be contaminated and unsuitable for sensitive land use.	Low to moderate
Burial of general farm waste	DPI has indicated historic burial of general farm waste in the southern portion of this zone. DPI suggests an area of approximately 3 ha.	Buried waste poses an aesthetic hazard for development and may introduce contamination to soil and groundwater.	High
Burial of potentially radioactive carcasses	DPI has indicated historic burial of potentially radioactive carcasses in the south western portion of this zone. DPI suggests an area of approximately 3 ha. The presence or degree of radioactivity has not been assessed.	Buried waste poses an aesthetic hazard for development and may introduce biological, chemical or radioactive contamination to soil and groundwater.	High
Drainage Channel	A shallow earthen drain runs from the College entrance towards the south west.	Contaminated sediments from the site, or urban drainage off-site, may have accumulated in the drain.	Low to Moderate.

Table 3. Summary of Areas of Potential Environmental Concern – University Medical Core (2) b

APEC	Description	Implication	Likelihood
Possible Railway use	Site may have been used in the early 1900 for railway related uses.	Land may have become contaminated by fuels, ash or herbicides.	Low
Filling	Minor evidence of filling of soils.	Fill may contain contaminants from source location or other waste materials contained within.	Low
Paddocks	Majority of the site has been used for cropping by the research farm. Use is likely to have included irrigation (potentially with wastewater), application of fertilisers, pesticides and herbicides (potentially at levels much higher than standard agricultural use)	Former uses may have contaminated or otherwise affected near surface (top 0.2m) soils. Topsoil potentially unsuitable for residential or other sensitive uses.	Low to moderate

Table 4. Summary of Areas of Potential Environmental Concern – City Extension (4)

APEC	Description	Implication	Likelihood
Paddocks	Majority of the site has been used for cropping by the research farm. Use is likely to have included irrigation (potentially with wastewater), application of fertilisers, pesticides and herbicides (potentially at levels much higher than standard agricultural use)	Former uses may have contaminated or otherwise affected near surface (top 0.2m) soils. Topsoil potentially unsuitable for residential or other sensitive uses.	Low to moderate
Drainage Channels	Concrete lined channels and earthen channels run through the centre of the site (north-south) and along the western boundary. Western trunk sewer also runs through the centre of the site (underground).	Sediments may be contaminated and unsuitable for sensitive land use. Fill may contain contaminants from source location or other waste materials contained within.	Moderate
Filling	Some soil filling and rubbish evident around the dirt bike track.	Fill may contain contaminants from source location or other waste materials contained within.	Moderate
Buried Farm Waste	DPI has indicated historic burial of general farm waste in the southern portion of this zone. DPI suggests an area of approximately 3 ha.	Buried waste poses an aesthetic hazard for development and may introduce contamination to soil and groundwater.	High

Table 5. Summary of Areas of Potential Environmental Concern – Interim Enterprise (5), Regional Sporting Facility and part Point Cook Neighbourhoods

APEC	Description	Implication	Likelihood
Paddocks	Majority of the site has been used for cropping by the research farm. Use is likely to have included irrigation (potentially with wastewater), application of fertilisers, pesticides and herbicides (potentially at levels much higher than standard agricultural use)	Former uses may have contaminated or otherwise affected near surface (top 0.2m) soils. Topsoil potentially unsuitable for residential or other sensitive uses.	Low to moderate
Dams	Three farm dams are present that would have received runoff from surrounding paddocks, which may have included contaminated soils or soluble chemicals.	Sediments may be contaminated and unsuitable for sensitive land use or ecosystem protection.	Low to moderate
Stockpiles	Approximately 5,000m^3 of fill evident. Source of soil is not known.	Fill may contain contaminants from source location or other waste materials contained within. Impacts could affect underlying soils/groundwater as well as the fill volume itself.	Moderate
Stock yards and sheds	Five areas where yards and/or sheds are present and there is evidence of chemical use and waste disposal. Areas include a timber yard. Research use of land is likely to have increased the potential for chemical contamination c.f. standard agricultural use.	Former uses may have contaminated soils with pesticides, fuels, rubbish or biological hazards. Localised soils may be potentially unsuitable for residential or other sensitive uses.	Moderate
Drainage Channel	Open earthen drain that crosses the southern part of the site.	Sediments may be contaminated and unsuitable for sensitive land use.	Moderate
WAG pipeline	High pressure crude oil pipeline runs along the northern and western boundaries of the site.	Leaks of pipeline can impact soil and groundwater, posing human health risks to landusers and groundwater uses. Remediation (while not the liability of the land owner) would result in delays to availability of land.	Low

Tables 6 to 10 provide indicative costs associated with anticipated assessment and possible audit and remediation activities across the zones. A range of remediation costs (in addition to any other site earthworks) is provided, based on potential conditions. As assessment works are conducted, the estimation of remediation costs could be refined to narrow the likely final cost range.

It is considered there is only a 5% chance that ultimate costs will be below the 'low' indicative cost, a 50% chance they will be below the 'likely' cost and a 95% chance that they will be below the 'high' cost. In preparing these indicative costs, we have attempted to consider potential variability in the extent and severity of site contamination.

Costs for active groundwater remediation have not been included. It has been assumed at this stage that source removal (i.e. excavation of buried waste or fuel infrastructure and associated contaminated soil) would be sufficient to allow use of land. Groundwater remediation costs to allow beneficial use of groundwater are very sensitive to the proposed groundwater use, the aquifer geology and the contaminant type. Localised contamination of the shallow aquifer would not necessarily adversely impact on the ability to use deeper aquifers, or pose a risk to off-site users of the shallow aquifer.

Remediation costs can vary significantly for a given contamination condition, depending on:

- the proposed land-use,
- the potential for appropriate site re-use and
- feasibility of on-site or in-situ remediation.

Where these factors can be considered or accommodated during site development, value can be optimised by balancing remediation costs and revenue. For example, if a contaminated portion of land can be nominated for a less-sensitive land use and delayed for divestment, then on-site remediation can be conducted to reduce the health risk and minimise remediation costs. In contrast, a requirement for quick divestment for sensitive land uses would generally require higher cost remediation techniques to be applied.

Table 6. City Zone (1) Indicative costs of Assessment, Audit and Remediation, based on available information.*

APEC	Assessment	Audit	Remediation		
			Low (5%ile)	**Likely**	**High (95%ile)**
Old farm buildings	*Soil assessment – Approx 50 locations* Consultant - $30,000 Sub-contractor - $20,000 Laboratory - $20,000 *Groundwater Assessment – Approx 5 locations* Consultant - $30,000 Sub-contractor - $20,000 Laboratory - $1,500	Audit unlikely to be required on every sub-site within the zone. Sub-sites with ongoing uses and sites proposed for non-sensitive industrial use are unlikely to be nominated, unless evidence of a significant issue is present. EPA fee approx. $5,000 for single audit. Auditor fees will vary depending on complexity. Anticipated costs $100,000 to $200,000, but would increase if complex issues are identified or long-term remediation is required.	200m^3 Category C, 500m^3 Fill Material $155,000	700m^3 impacted soil 200m^3 Category B, 300m^3 Category C and 200m^3 Fill material $420,000	500m^3 Category B, 1,000m^3 Category C $1million
Filling of soils	*Soil Assessment (approx. 6,000m^3)* Consultant - $40,000 Sub-contractor - $3,000 Laboratory - $10,000		100m^3 Fill Material $15,000	1,000m^3 Category C, 500m^3 Fill Material $460,000	1,000m^3 Category B, 2,000m^3 Category C $2million
Boiler, incinerator	*Soil Assessment – approx 15 locations* Consultant - $15,000 Sub-contractor - $12,000 Laboratory - $3,000		none $30,000	20m^3 Category B $110,000	50m^3 Category A
Waste burial	*Soil Assessment* Consultant - $20,000 Sub-contractor - $30,000 Laboratory - $5,000		500m^3 Fill Material $9,000	50m^3 Category C $22,000	100m^3 Category B $140,000
Spray shed and chemical storage	*Soil assessment – Approx 10 locations* Consultant - $15,000 Sub-contractor - $10,000 Laboratory - $3,000 *Groundwater Assessment – Approx 2 locations* Consultant - $8,000 Sub-contractor - $12,000 Laboratory - $1,000		50m^3 Category C, $20,000	50m^3 Category B, 50m^3 Category C $90,000	50m^3 Category A, 300m^3 Category B $500,000

Table 6. City Zone (1) Indicative costs of Assessment, Audit and Remediation, based on available information. (continued)

APEC	Assessment	Audit	Remediation		
			Low (5%ile)	**Likely**	**High (95%ile)**
Sheep dip	*Soil assessment – Approx 20 locations* Consultant - $20,000 Sub-contractor - $5,000 Laboratory - $4,500 *Groundwater Assessment – Approx 2 locations* Consultant - $10,000 Sub-contractor - $15,000 Laboratory - $1,000		50m^3 Category C, $20,000	50m^3 Category B, 150m^3 Category C $130,000	50m^3 Category A, 500m^3 Category B $800,000
Filled silt dam	*Soil Assessment – approx. 15 locations* Consultant - $16,000 Sub-contractor - $6,000 Laboratory - $5,000		None	None	1,000m^3 Category B, 1,000m^3 Category C $1.8million
Burial of carcasses	*Soil assessment – Approx 60 locations* Consultant - $35,000 Sub-contractor - $10,000 Laboratory - $10,000 *Groundwater Assessment – Approx 3 locations* Consultant - $15,000 Sub-contractor - $20,000 Laboratory - $1,000 *Soil Gas Assessment* Consultant - $20,000 Sub-contractor - $15,000 Laboratory - $15,000 Risk Assessment - $20,000		Confirm cap, confirm low risk and modify site use. $100,000	35,000m^3 Category C $14million	35,000m^3 Category A or incineration $770million

Table 6. City Zone (1) Indicative costs of Assessment, Audit and Remediation, based on available information. (continued)

APEC	Assessment	Audit	Remediation		
Burial of potentially radioactive carcasses	*Soil and surface water assessment – Approx 10m grid* Consultant - $25,000 Sub-contractor - $20,000 Laboratory - $ 15,000 Radiation Risk Assessment - $20,000 *Groundwater Assessment – Approx 3 locations* Consultant - $25,000 Sub-contractor - $10,000 Laboratory - $2,000 Radiation Risk Assessment - $20,000		Confirm cap, confirm low risk and modify site use. $150,000	10,000m^3 Category C $4million	10,000m^3 Category A or incineration $200million
Electrical transformers	*Soil Assessment* Consultant - $15,000 Sub-contractor - $12,000 Laboratory - $2,000		none	none	30m^3 Category B $40,000
Septic tanks	None		200m^3 Fill Material $30,000	1,000m^3 Fill Material $140,000	1,000m^3 Category C $400,000
Effluent sumps	None		100m^3 Fill Material $15,000	500m^3 Fill Material $70,000	500m^3 Category C $200,000
Drainage channel	*Soil Assessment – approx 60 locations* Consultant - $40,000 Sub-contractor - $6,000 Laboratory - $10,000		1,250m^3 Fill Material $170,000	1,250m^3 Fill Material $170,000	2,000m^3 Category B $2.5million
Building demolition waste	*Hazardous materials survey* Consultant - $50,000 Laboratory - $10,000		100m^3 Fill Material $15,000	100m^3 Category C $40,000	200m^3 Category C $80,000

Table 6. City Zone (1) Indicative costs of Assessment, Audit and Remediation, based on available information. (continued)

APEC	Assessment	Audit	Remediation		
Paddocks	*Soil assessment –* *Approx 1,500 locations* Consultant - $80,000 Sub-contractor - $25,000 Laboratory - $200,000 *Groundwater Assessment –* *Approx 8 locations* Consultant - $30,000 Sub-contractor - $35,000 Laboratory - $2,500		none	18,000m^3 Category C Scrape and reuse of site $800,000 or Dispose off-site $7million	200,000m^3 Category B Remediate on-site $3million or Dispose off-site $270million
Food science Australia	*Soil assessment –* *Approx 50 locations* Consultant - $35,000 Sub-contractor - $15,000 Laboratory - $20,000 *Groundwater Assessment –* *Approx 5 locations* Consultant - $20,000 Sub-contractor - $25,000 Laboratory - $1,500		200m^3 Category C, 500m^3 Fill Material $155,000	700m^3 impacted soil 200m^3 Category B, 300m^3 Category C and 200m^3 Fill material $420,000	500m^3 Category B, 1,000m^3 Category C $1million
Potential workshops	*Soil assessment –* *Approx 60 locations* Consultant - $50,000 Sub-contractor - $30,000 Laboratory - $20,000 *Groundwater Assessment –* *Approx 16 locations* Consultant - $35,000 Sub-contractor - $55,000 Laboratory - $5,000		1,500m^3 Category C 2,000m^3 Fill Material $800,000	3,500m^3 impacted soil 500m^3 Category B, 2,000m^3 Category C and 1,000m^3 Fill material $1.4 million	2,000m^3 Category B, 1,000m^3 Category C $3million

Table 6. City Zone (1) Indicative costs of Assessment, Audit and Remediation, based on available information. (continued)

APEC	Assessment	Audit	Remediation		
State Chemical Labs, KRC and Meat Research Centre	*Soil assessment – Approx 60 locations* Consultant - $35,000 Sub-contractor - $20,000 Laboratory - $25,000 *Groundwater Assessment – Approx 8 locations* Consultant - $30,000 Sub-contractor - $30,000 Laboratory - $2,500		200m^3 Category C 500m^3 Fill Material $155,000	1,100m^3 impacted soil 300m^3 Category B, 500m^3 Category C and 300m^3 Fill material $670,000	500m^3 Category B, 1,000m^3 Category C $1million
Other facilities	*Soil assessment – Approx 90 locations* Consultant - $55,000 Sub-contractor - $30,000 Laboratory - $23,000 *Groundwater Assessment – Approx 16 locations* Consultant - $35,000 Sub-contractor - $55,000 Laboratory - $5,000		500m^3 Fill Material $35,000	700m^3 impacted soil 200m^3 Category B, 300m^3 Category C and 200m^3 Fill material $420,000	500m^3 Category B, 1,000m^3 Category C $1million
Dams and ponds	*Soil and Sediment Assessment* Consultant - $30,000 Sub-contractor - $3,000 Laboratory - $5,000		250m^3 Fill Material $70,000	250m^3 Category C $100,000	250m^3 Category B $340,000
Cumulative indicative likely costs	**Consultant - $864,000** **Sub-contractor - $549,000** **Laboratory - $428,500** **Risk Assessment - $60,000**	**$105,000 to $205,000 per sub-site**	**$1,914,000**	**$23.4million** (far greater cost if off-site disposal pursued)	**$989million** (far greater cost if off-site disposal pursued)

* Indicative costs are highly speculative and subject to change with the gathering of further data.

Table 7. University Medical Core Zone (2a) Indicative costs of Assessment, Audit and Remediation, based on available information.

APEC	Assessment	Audit	Remediation		
			Low (5%ile)	**Likely**	**High (95%ile)**
Veterinary College	*Soil assessment – Approx 30 locations* Consultant - $30,000 Sub-contractor - $15,000 Laboratory - $10,000 *Groundwater Assessment – Approx 5 locations* Consultant - $30,000 Sub-contractor - $20,000 Laboratory - $1,500	Unlikely to be required as already in use.	Small volume of soil from isolated hotspot. 20m^3 of Category C $10,000	Replacement of isolated fill around grounds, 50 m^3 of Category C waste, and Hotspot excavation at trade waste pits or workshop, 150m^3 of Category C and 50m^3 Category B. $150,000	Excavation of hotspots at multiple locations, 500 m^3 Category B $680,000
Paddocks	*Soil assessment – Approx 1,000 locations* Consultant - $70,000 Sub-contractor - $22,000 Laboratory - $50,000 *Groundwater Assessment – Approx 5 locations* Consultant - $30,000 Sub-contractor - $20,000 Laboratory - $1,500	EPA fee approx. $5,000 for single audit. Auditor fees will vary depending on complexity. Anticipated costs $80,000 to $120,000, but would increase if complex issues are identified or long-term remediation is required.	None	60,000m^3 unsuitable soil. Scrape and reuse elsewhere. $800,000 or Scrape and dispose as Category C waste. $20 million	400,000m^3 contaminated soil. Scrape and remediate on-site. $2.5million or Scrape and dispose as Category B waste. $300million
Sheep Yard	*Soil Assessment* Consultant - $12,000 Sub-contractor - $4,500 Laboratory - $2,000		None	500m^3 of impacted soil 300m^3 Category C waste for disposal + 200m^3 Category B waste for disposal $400,000	1000m^3 of Category B for disposal $1,350,000
Dam	*Surface water and sediment assessment* Consultant - $12,000 Sub-contractor - $2,000 Laboratory - $2,000		None	1000m^3 Category C waste for disposal $300,000	1000m^3 Category B and 1000m^3 Category C waste for disposal $1,800,000
Filling	*Soil Assessment* Consultant - $35,000 Sub-contractor - $5,000 Laboratory - $10,000		100m^3 of aesthetically unsuitable “fill material” to landfill $15,000	200m^3 Category C waste for disposal + 100m^3 Category B waste for disposal $95,000	m^3 Category B waste for disposal $1,200,000

Table 7. University Medical Core Zone (2a) Indicative costs of Assessment, Audit and Remediation, based on available information. (continued)

APEC	Assessment	Audit	Remediation		
Drainage Channel	*Sediment and Soil Assessment* Consultant - $15,000 Sub-contractor - $1,000 Laboratory - $2,500		200m^3 of aesthetically unsuitable "fill material" to landfill and 50m^3 Category C waste for disposal $50,000	250m^3 Category C waste for disposal $100,000	250m^3 Category B waste for disposal $350,000
Burial of General farm waste	*Soil assessment –* *Approx 20m grid* Consultant - $20,000 Sub-contractor - $5,000 Laboratory - $12,000 *Groundwater Assessment –* *Approx 2 locations* Consultant - $25,000 Sub-contractor - $13,000 Laboratory - $1,000		Confirm cap and restrict site use $500,000	Excavate and dispose off site. 15,000m^3 5,000m^3 Category C 10,000m^3 Fill Material $9 million	Excavate and dispose off site. 50,000m^3 Category B and Incineration (clinical wastes) $70 million
Burial of potentially radioactive carcasses	*Soil and surface water assessment –* *Approx 10m grid* Consultant - $25,000 Sub-contractor - $20,000 Laboratory - $ 25,000 Radiation Risk Assessment - $20,000 *Groundwater Assessment –* *Approx 5 locations* Consultant - $30,000 Sub-contractor - $15,000 Laboratory - $2,000 Radiation Risk Assessment - $20,000		Confirm cap and restrict site use $500,000	30,000m^3 impacted material, classed as clinical waste. Excavate and dispose off site $60 million	30,000m^3 impacted material, classed as clinical and radioactive waste. Excavate and dispose off site. $100 million
Cumulative indicative likely costs	**Consultant - $334,000** **Sub-contractor - $142,500** **Laboratory - $119,500** **Risk Assessment - $40,000**	**$85,000 to $125,000**	**$1,075,000**	**$70.8million** (far greater cost if off-site disposal pursued)	**$178million** (far greater cost if off-site disposal pursued)

* Indicative costs are highly speculative and subject to change with the gathering of further data.

Table 8. University Medical Core Zone (2b) Indicative costs of Assessment, Audit and Remediation, based on available information.

APEC	Assessment	Audit	Remediation		
			Low (5%ile)	**Likely**	**High (95%ile)**
Railway Use	*Soil Assessment (10 locations)* Consultant - $15,000 Sub-contractor - $3,000 Laboratory - $1,000	EPA fee approx. $5,000 for single audit. Auditor fees will vary depending on complexity. Anticipated costs $20,000 to $50,000, but would increase if complex issues are identified or long-term remediation is required.	None	200m^3 Category C waste for disposal $80,000	600m^3 of unsuitable soil 200 m^3 Category B 200 m^3 Category C 200 m^3 Fill Material waste for disposal $350,000
Filling	*Soil Assessment* Consultant - $15,000 Sub-contractor - $3,000 Laboratory - $1,000		None	100 m^3 Category C waste for disposal $40,000	500m^3 Category C waste for disposal $40,000
Paddocks	*Soil assessment – Approx 120 locations* Consultant - $30,000 Sub-contractor - $20,000 Laboratory - $18,000 *Groundwater Assessment – Approx 5 locations* Consultant - $25,000 Sub-contractor - $20,000 Laboratory - $2,000		None	500m^3 unsuitable soil. Scrape and reuse elsewhere. $100,000 or Scrape and dispose as Category C waste. $200,000	2,400m^3 contaminated soil. Scrape and remediate on-site. $ 1.5 million or Scrape and dispose as Category B waste. $3.2 million
Cumulative indicative likely costs	**Consultant - $85,000** **Sub-contractor - $56,000** **Laboratory - $22,000**	**$25,000 to $55,000**	**None**	**$220,000** (far greater cost if off-site disposal pursued)	**$1,890,000** (far greater cost if off-site disposal pursued)

* Indicative costs are highly speculative and subject to change with the gathering of further data.

Table 9. Point Cook Neighbourhoods (3) Indicative costs of Assessment, Audit and Remediation, based on available information.

APEC	Assessment	Audit	Remediation		
			Low (5%ile)	**Likely**	**High (95%ile)**
Paddocks	*Soil assessment – Approx 1,000 locations* Consultant - $75,000 Sub-contractor - $25,000 Laboratory - $70,000 *Groundwater Assessment – Approx 7 locations* Consultant - $40,000 Sub-contractor - $25,000 Laboratory - $2,000	EPA fee approx. $5,000 for single audit. Auditor fees will vary depending on complexity. Anticipated costs $50,000 to $100,000, but would increase if complex issues are identified or long-term remediation is required.	None	60,000m^3 unsuitable soil. Scrape and reuse elsewhere. $800,000 or Scrape and dispose as Category C waste. $20 million	200,000m^3 contaminated soil. Scrape and remediate on-site. $2.5million or Scrape and dispose as Category B waste. $250million
Dam	*Surface water and sediment assessment* Consultant - $10,000 Sub-contractor - $2,000 Laboratory - $1,000		None	20m^3 Category C waste for disposal $7,000	50m^3 Category B waste for disposal $60,000
Filling	*Soil Assessment* Consultant - $8,000 Sub-contractor - $1,000 Laboratory - $1,500		30m^3 of aesthetically unsuitable "fill material" to landfill $5,000	20 m^3 Category C waste for disposal + 10m^3 Category B waste for disposal $20,000	30m^3 Category B waste for disposal $40,000
Local Burn	*Soil Assessment* Consultant - $4,000 Sub-contractor - $- Laboratory - $1,000		25m^3 Category C waste for disposal $14,000	25m^3 Category B waste for disposal $30,000	25m^3 Category A waste for disposal $60,000
WAG pipeline	*Soil and Groundwater Assessment* Consultant - $30,000 Sub-contractor - $25,000 Laboratory - $4,000		None	None	12 months + of delay in access to land.
Cumulative indicative likely costs	**Consultant - $167,000** **Sub-contractor - $78,000** **Laboratory - $84,000** (total cost accrued over 3-4 stages)	**$55,000 to $105,000**	**$19,000**	**$857,000** (far greater cost if off-site disposal pursued)	**$2.7million + delays** (far greater cost if off-site disposal pursued)

* Indicative costs are highly speculative and subject to change with the gathering of further data.

Table 10. City Extension (4) Indicative costs of Assessment, Audit and Remediation, based on available information.

APEC	Assessment	Audit	Remediation		
			Low (5%ile)	**Likely**	**High (95%ile)**
Paddocks	*Soil assessment – Approx 400 locations* Consultant - $35,000 Sub-contractor - $20,000 Laboratory - $60,000 *Groundwater Assessment – Approx 5 locations* Consultant - $10,000 Sub-contractor - $18,000 Laboratory - $2,000	EPA fee approx. $5,000 for single audit. Auditor fees will vary depending on complexity. Anticipated costs $50,000 to $100,000, but would increase if complex issues are identified or long-term remediation is required.	None	2,000m^3 unsuitable soil. Scrape and reuse elsewhere. $300,000 or Scrape and dispose as Category C waste. $800,000	14,000m^3 contaminated soil. Scrape and remediate on-site. $1.5million or Scrape and dispose as Category B waste. $12 million
Drainage	*Sediment assessment* Consultant - $20,000 Sub-contractor - $10,000 Laboratory - $10,000		1,000m^3 Fill Material for disposal $140,000	1,000m^3 Category C waste for disposal $400,000	1,000m^3 Category B waste for disposal $1.4 million
Filling	*Soil Assessment* Consultant - $28,000 Sub-contractor - $11,000 Laboratory - $18,000		1,000m^3 of aesthetically unsuitable “fill material” to landfill $140,000	500 m^3 Category C waste for disposal + 1,000m^3 Fill Material $350,000	1,000 m^3 Category C + 1,000m^3 Category B waste for disposal $1.8 million
Burial of General farm waste	*Soil assessment – Approx 20m grid – 30 locations* Consultant - $15,000 Sub-contractor - $8,000 Laboratory - $12,000 *Groundwater Assessment – Approx 2 locations* Consultant - $8,000 Sub-contractor - $10,000 Laboratory - $1,000		Confirm cap and restrict site use $200,000	Excavate and dispose off site. 7,000m^3 2,000m^3 Category C 5,000m^3 Fill Material $1.5 million	Excavate and dispose off site. 13,000m^3 Category B and Incineration (clinical wastes) $17.5 million
Cumulative indicative likely costs	**Consultant - $116,000** **Sub-contractor - $77,000** **Laboratory - $103,000**	**$55,000 to $105,000**	**$480,000**	**$2,550,000 +**	**$22.2million +**

* Indicative costs are highly speculative and subject to change with the gathering of further data.

Table 11. Interim Enterprise (5) Indicative costs of Assessment, Audit and Remediation, based on available information.

APEC	Assessment	Audit	Remediation		
			Low (5%ile)	**Likely**	**High (95%ile)**
Paddocks	*Soil assessment – Approx 1,200 locations* Consultant - $75,000 Sub-contractor - $25,000 Laboratory - $120,000 *Groundwater Assessment – Approx 8 locations* Consultant - $40,000 Sub-contractor - $30,000 Laboratory - $3,000	EPA fee approx. $5,000 for single audit. Auditor fees will vary depending on complexity. Anticipated costs $50,000 to $100,000, but would increase if complex issues are identified or long-term remediation is required.	None	25,000m^3 unsuitable soil. Scrape and reuse elsewhere. $500,000 or Scrape and dispose as Category C waste. $10 million	250,000m^3 contaminated soil. Scrape and remediate on-site. $2.5million or Scrape and dispose as Category B waste. $300million
Dams	*Surface water and sediment assessment* Consultant - $16,000 Sub-contractor - $1,000 Laboratory - $5,000		800m^3 of aesthetically unsuitable material $110,000	800m^3 of Category C waste for disposal $300,000	800m^3 of Category B waste for disposal $1million
Stockpiles	*Soil assessment* Consultant - $20,000 Sub-contractor - $1,000 Laboratory - $4,000		None	500m^3 of aesthetically unsuitable material $70,000	5,000m^3 of Category C waste for disposal $2million
Stockyards and sheds	*Soil assessment* Consultant - $45,000 Sub-contractor - $40,000 Laboratory - $20,000		100m^3 of Category B and 200m^3 of Category C waste for disposal $200,000	200m^3 of Category B and 500m^3 of Category C waste for disposal $500,000	200m^3 of Category A, 500m^3 of Category B, 200m^3 of Category C, waste for disposal $1million
Drainage Channel	*Soil assessment* Consultant - $25,000 Sub-contractor - $6,000 Laboratory - $10,000		500m^3 of aesthetically unsuitable material $70,000	500m^3 of Category C waste for disposal $200,000	500m^3 of Category B waste for disposal $680,000
WAG pipeline	*Soil and Groundwater Assessment* Consultant - $20,000 Sub-contractor - $30,000 Laboratory - $4,000		None	None	12 months + of delay in access to land.
Cumulative indicative likely costs	**Consultant - $241,000** **Sub-contractor - $133,000** **Laboratory - $166,000**	**$55,000 to $105,000**	**$380,000**	**$1,570,000** (far greater cost if off-site disposal pursued)	**$7.18million + delays** (far greater cost if off-site disposal pursued)

4 SUMMARY

This advice has been prepared to provide an indication of potential cost implications related to identified potential contamination issues in the precinct. The advice has utilised the findings of the Phase 1 Environmental Site Assessment conducted by Compass Environmental (Compass 2009) to identify areas of potential environmental concern (APECs). An indication of the likelihood of contamination being present at each APEC has been nominated based on our experience on other sites and does not reflect any actual site data or, otherwise unreported, knowledge of the site. Indicative assessment, audit and remediation costs were then prepared for each APEC within each zone, based on our interpretation of the anticipated extend and severity of contamination. Costs for statutory environmental audit will vary for sites depending on the size and complexity of the impact and remediation. Some zones are likely to be sub-divided for audit, which would result in multiple audit costs within a zone. 'High' and 'Low' estimates of remediation costs were also prepared based on our interpretation of potential variations in the extent and severity of contamination. The indicative costs should be used with caution as they have been estimated in the absence of any site data. Site assessment data should be used, as it is collected, to reassess and refine remediation estimates.

4.1 Common Potential Contamination Issues

Much of the southern and western portion of the precinct has historically been used for cropping. The potential for there to have been non-standard chemicals and application rates, related to past research activities at the site, increases the likelihood of contamination relative to normal agricultural use. Local hotspots of chemical accumulation may occur around stockyards, dipping stations, dams and drains. Should practices have resulted in contamination of topsoil in paddocks, then potentially very large volumes of soil may be unsuitable for possible future uses.

Farm waste burial pits, including those used for burial of carcasses, would be unsuitable to remain within the developed site beneath structures or anywhere within sites used for sensitive uses. It is noted that one of the areas nominated by DPI as potentially having been used for burial of carcasses coincides with current student residences. Decomposing matter causes geotechnical hazards and can result in accumulation of harmful gases. The buried waste at this site may also be contaminated by biological, radioactive or chemical hazards. Open space development may be suitable over the waste, following confirmation by site characterisation and risk assessment. If excavation and removal of the waste is required, then characterisation of the waste (radioactive, clinical, biologically or chemically contaminated) will be required and will dictate the disposal options. Animal carcasses will potentially be deemed 'clinical waste', which would require incineration. Incineration facilities are available, but capacity is limited and processing of large volumes could delay clean-up. Radiation as a result of radio-labelled tracers is likely to be a low risk in solid waste, and is unlikely to drive waste disposal requirements. However, some radioactive isotopes may have entered surface water or groundwater and an assessment of impacts and associated risks will be required.

The facilities present in the eastern and northern parts of the precinct include numerous potential contaminating components, such as vehicle workshops, incinerators, waste disposal pits, fuelling stations and chemical use. The potential for these components to have resulted in contamination of soil or groundwater will depend on the procedures followed at these facilities.

Former site activities have the potential to have resulted in very large volumes of contaminated soil or waste, which would require treatment or disposal prior to site development. In some cases, off-site disposal is unlikely to be a financially viable option and on-site remediation or pragmatic re-use of materials on-site is likely to be required.

4.2 Contamination Assessment Approach

The vision for the precinct (David Lock Associates 2009) indicates that areas within each zone are likely to be nominated for sensitive landuses. The planning authority is likely to require a statutory environmental audit prior to land development to confirm that the land is suitable for the proposed use on many, if not all zones and sub-sites. Sensitive land use and application of a statutory environmental audit both demand a high level of assessment. Presentation of evidence demonstrating that the site is not contaminated, prior to application of an EAO, may avoid the requirement for a statutory environmental audit being applied to the planning permit.

The final scope of site assessment will depend on the conditions identified, and the sensitivity of the proposed landuse. Assessment of each zone would be best addressed over three or four stages to refine site data as the understanding of site issues develops.

Assessment of potential contamination related to the WAG pipeline would be best addressed separately as any contamination identified would be referred to the pipeline owner for remediation.

Sub-sites, such as CSIRO or Melbourne University Veterinary College would be best assessed separately from the general zone, particularly where the sub-site is likely to continue to operate under the same use.

Staged assessment would be particularly relevant where an environmental audit is required, to ensure auditor concerns are addressed as efficiently as possible.

Land may be divested before or after completion of the statutory environmental audit. Early assessment and audit prior to divestment would maximise revenue from divestment. However, divestment without the completion of an audit may allow total development value to be optimised by balancing land-use, site condition and assessment effort.

Table 12 provides suggested assessment priorities, based on optimising project timing, narrowing indicative remediation cost ranges and assessing potential environmental liabilities. High priority has been assigned to areas where contamination could pose a liability to DPCD, regardless of whether development proceeds.

Table 12. Suggested Assessment Priorities.

Priority	Type	Examples
High	Potential sources of ongoing groundwater contamination	Buried waste and carcasses, existing USTs, confirmed sheep dips.
	Potential current risks to human health	Buried carcasses in the vicinity of student residences.
Medium	Areas with unknowns driving high potential cost ranges	Paddocks, buried waste and carcasses.
	First stage release	Zone 3.
	Areas of high contamination potential.	Workshops, sheepdips, drains, chemical storage/use sheds.
	Areas likely to require remediation, where extra time is beneficial.	Workshops, effluent systems.
Low	Operating sites	CSIRO, Animal Health Centre.
	Late release sites, with low to medium potential for contamination.	Melbourne University Veterinary College

4.3 Summary of Indicative Costs by Zone

Indicative costs have been nominated for a range of possible outcomes in terms of actual contamination that may be present for the various potential contamination issues. The indicated assessment costs represent an estimate of the likely total cost, which may be accrued over multiple phases of work.

Table 13. Cumulative Indicative Likely Costs for Each Zone

Zone	Assessment	Audit	Remediation		
			Low (5%ile)	Likely	High (95%ile)
City Zone (1)	Consultant - $864,000 Sub-contractor - $549,000 Laboratory - $428,500 Risk Assessment - $60,000	$105,000 to $205,000 per sub-site	$1,914,000	$23.4million *	$989million*
University Medical Core Zone (2a)	Consultant - $334,000 Sub-contractor - $142,500 Laboratory - $119,500 Risk Assessment - $40,000	$85,000 to $125,000	$1,075,000	$70.8million*	$178million*
University Medical Core Zone (2b)	Consultant - $85,000 Sub-contractor - $56,000 Laboratory - $22,000	$25,000 to $55,000	None	$220,000*	$1,890,000*
Point Cook Neighbour-hoods (3)	Consultant - $167,000 Sub-contractor - $78,000 Laboratory - $84,000	$55,000 to $105,000	$19,000	$857,000*	$2.7million* + delays
City Extension (4)	Consultant - $116,000 Sub-contractor - $77,000 Laboratory - $103,000	$55,000 to $105,000	$480,000	$2,550,000*	$22.2million*
Interim Enterprise (5)	Consultant - $241,000 Sub-contractor - $133,000 Laboratory - $166,000	$55,000 to $105,000	$380,000	$1,570,000*	$7.18million* + delays

* Far greater cost if off-site disposal pursued for all APECs.

The current indicated range of remediation costs is large due to uncertainty about the presence, extent and severity of contamination.

Remediation costs can vary significantly for a given contamination condition, depending on:

- the proposed land-use,
- the potential for appropriate site re-use and
- feasibility of on-site or in-situ remediation.

Where these factors can be considered or accommodated during site development, value can be optimised by balancing remediation costs and revenue. For example, if a contaminated portion of land can be nominated for a less-sensitive land use and delayed for divestment, then on-site remediation can be conducted to reduce the health risk and minimise remediation costs. In contrast, a requirement for quick divestment for sensitive land uses would generally require higher cost remediation techniques to be applied.

4.4 Closure

We trust that this advice meets you current needs. Should you have any comments or questions, please contact the undersigned on 94731400.

For and on behalf of Coffey Environments Australia Pty Ltd

Sarah Richards
Principal

David Lam
Senior Principal

Attachment: Figure 1. Precinct Plan Showing Zones

Figure 2. Zone 1 – City

Figure 3. Zone 2a – University Medical Core

Figure 4. Zone 2b – University Medical Core

Figure 5. Zone 3 – Point Cook Neighbourhoods

Figure 6. Zone 4 – City Extension

Figure 7. Zone 5 – Interim Enterprise

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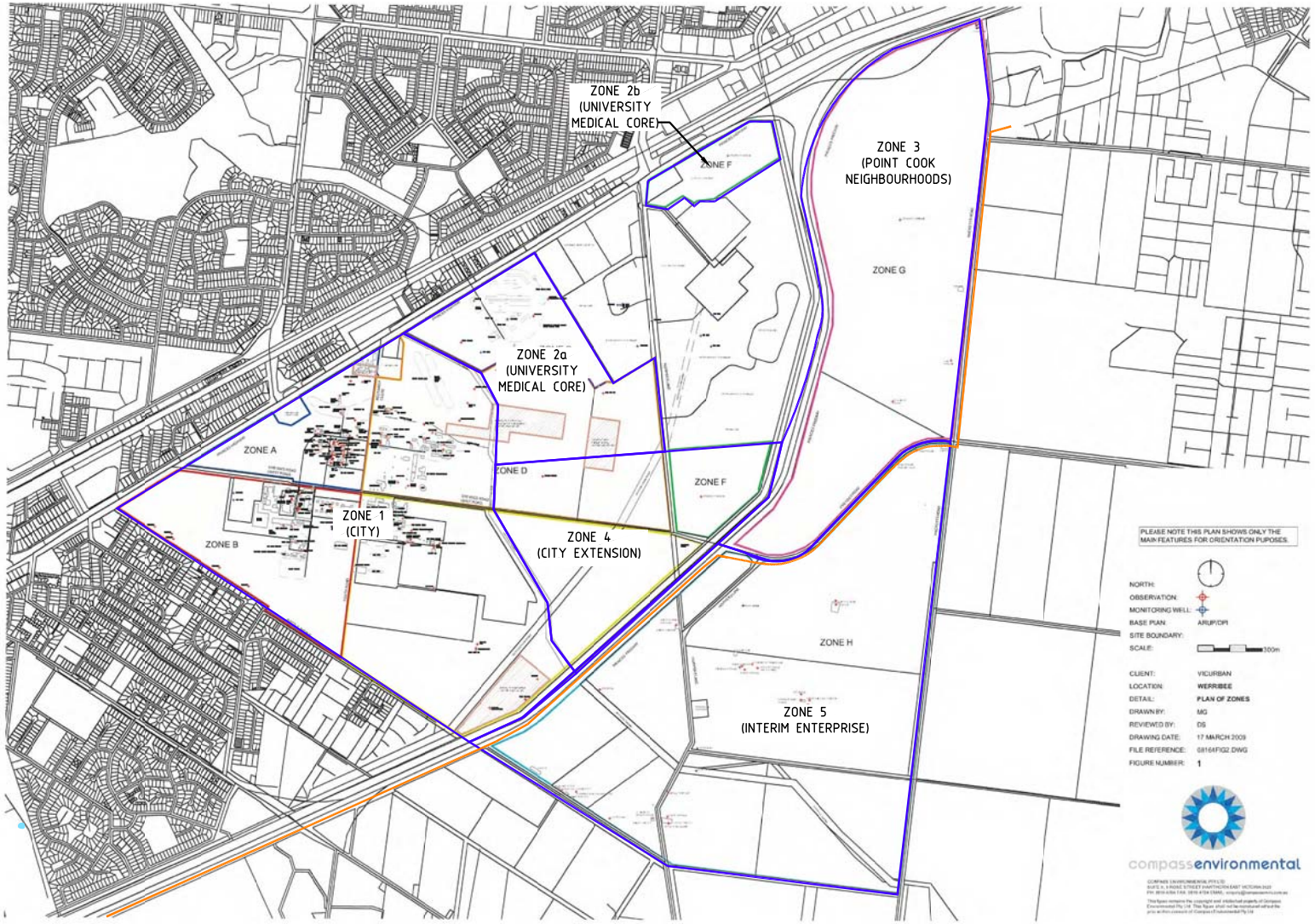

LEGEND

ZONE BOUNDARY

WAG PIPELINE

IMAGE SOURCE: COMPASS ENVIRONMENTAL, WEP Contamination Report, Figure 1, 17 March 2009

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Rev	Date	Revision Details	Drn
A	25.06.10	ZONING ISSUE	CGT

Client: DEPARTMENT OF PLANNING & COMMUNITY DEVELOPMENT

Project: WERRIBEE EMPLOYMENT DISTRICT

Location: WERRIBEE, VICTORIA

Drawing Title: **PRECINCT PLAN SHOWING ZONES**

Drawn	Date
CGT	25.06.10

Project - Drawing No.	Figure No.	Rev.
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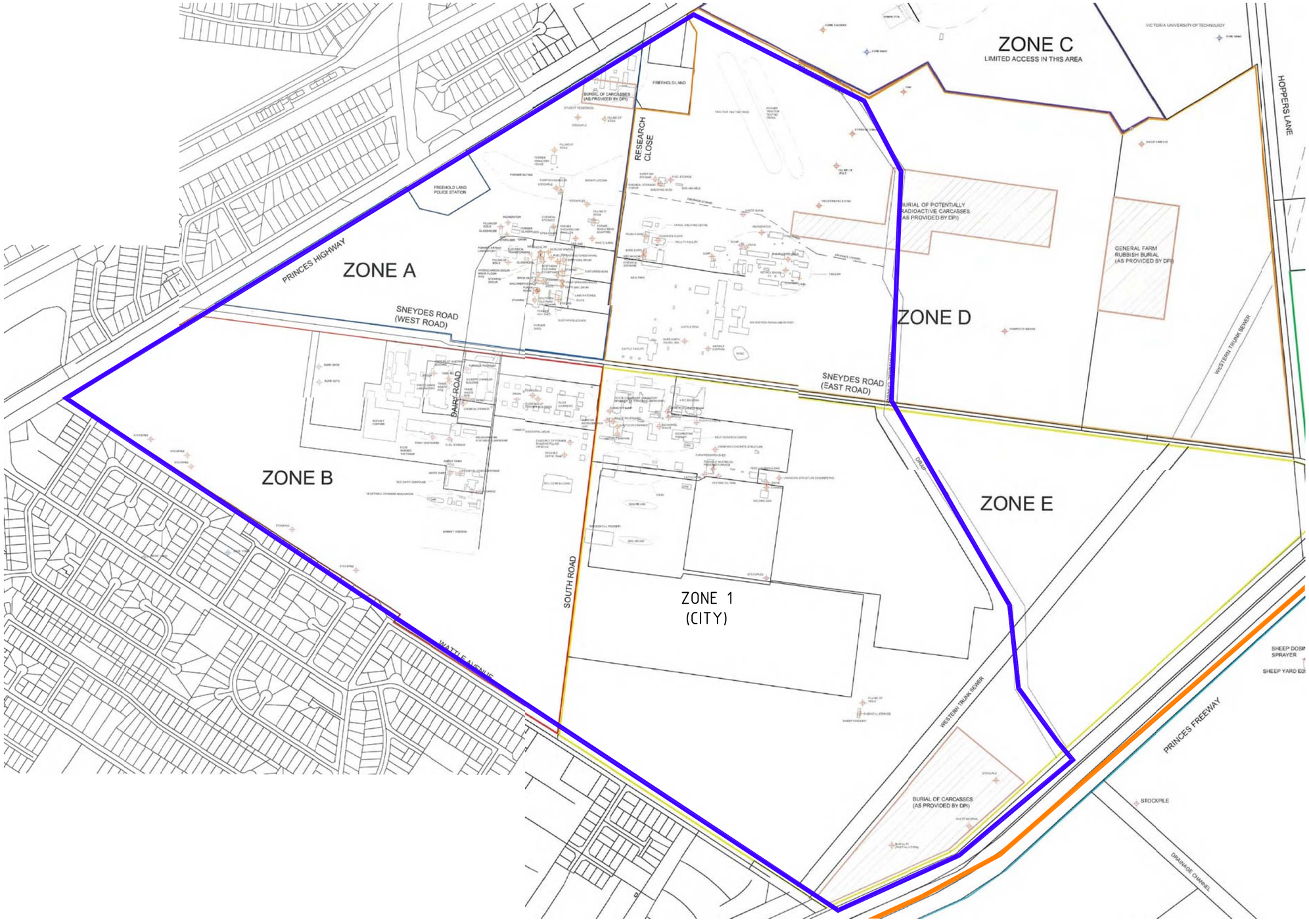

LEGEND

- ZONE BOUNDARY
- WAG PIPELINE

IMAGE SOURCE: COMPASS ENVIRONMENTAL, WEP Contamination Report, Figures 1-7, 17 March 2009

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A	25.06.10	ZONING ISSUE	CGT

Client: DEPARTMENT OF PLANNING & COMMUNITY DEVELOPMENT

Project: WERRIBEE EMPLOYMENT DISTRICT

Location: WERRIBEE, VICTORIA

Drawing Title: **ZONE 1 - CITY**

Drawn	Date	
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Project - Drawing No.	Figure No.	Rev.
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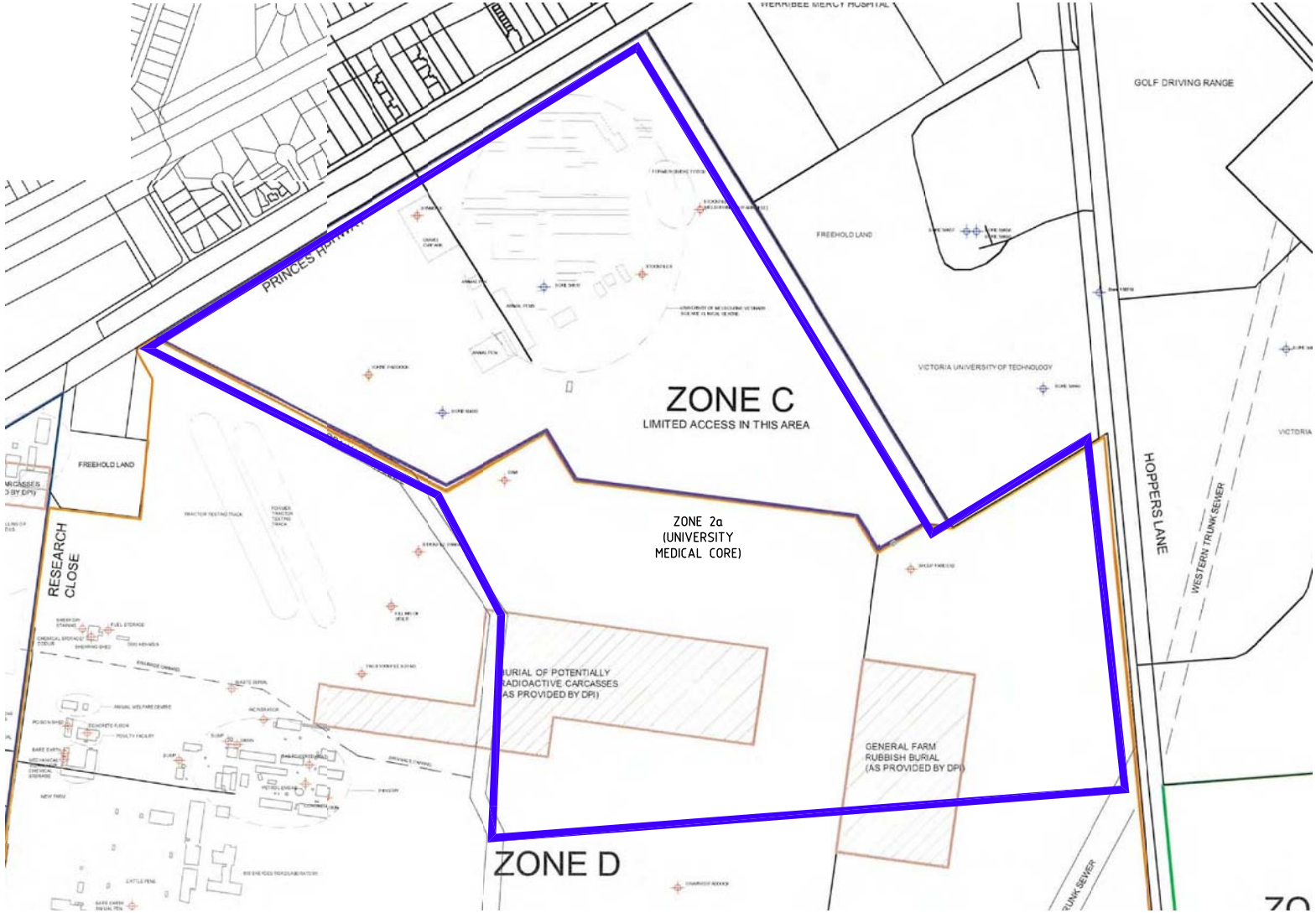

LEGEND

ZONE BOUNDARY

IMAGE SOURCE: COMPASS ENVIRONMENTAL, WEP Contamination Report, Figures 1-7, 17 March 2009

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Rev	Date	Revision Details	Drn
A	25.06.10	ZONING ISSUE	CGT

Client: DEPARTMENT OF PLANNING & COMMUNITY DEVELOPMENT

Project: WERRIBEE EMPLOYMENT DISTRICT

Location: WERRIBEE, VICTORIA

Drawing Title: **ZONE 2a - UNIVERSITY MEDICAL CORE**

Drawn	Date	
CGT	25.06.10	
Project - Drawing No.	Figure No.	Rev.
ENVIABTF09574AA-D02	3	A

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LEGEND

ZONE BOUNDARY

IMAGE SOURCE: COMPASS ENVIRONMENTAL, WEP Contamination Report, Figures 1-7, 17 March 2009

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Rev	Date	Revision Details	Drn
A	25.06.10	ZONING ISSUE	CGT

Client: DEPARTMENT OF PLANNING & COMMUNITY DEVELOPMENT

Project: WERRIBEE EMPLOYMENT DISTRICT

Location: WERRIBEE, VICTORIA

Drawing Title: **ZONE 2b - UNIVERSITY MEDICAL CORE**

Drawn	Date
CGT	25.06.10

Project - Drawing No.	Figure No.	Rev.
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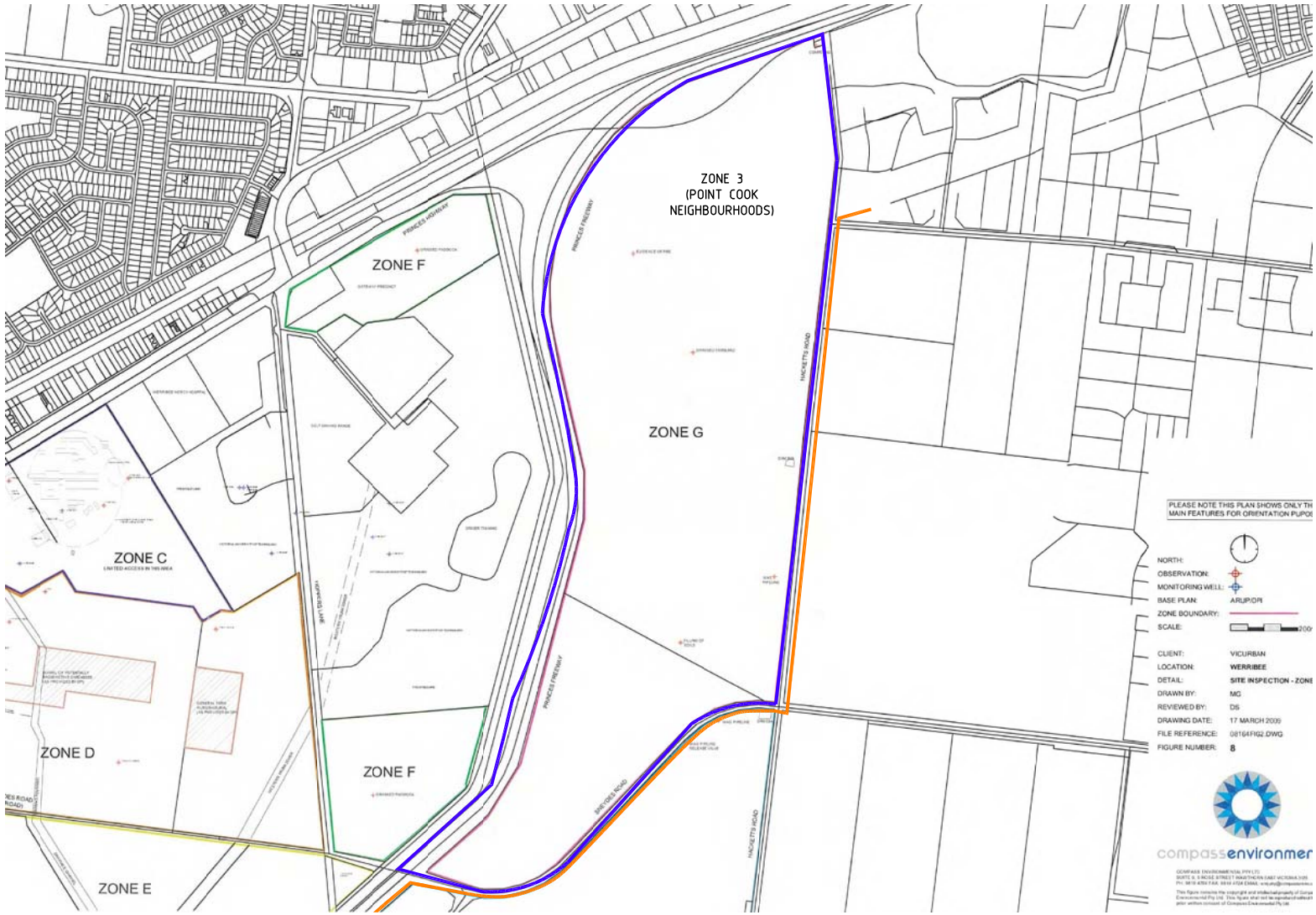

LEGEND

ZONE BOUNDARY

WAG PIPELINE

IMAGE SOURCE: COMPASS ENVIRONMENTAL, WEP Contamination Report, Figure 8, 17 March 2009

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Rev	Date	Revision Details	Drn
A	25.06.10	ZONING ISSUE	CGT

Client: DEPARTMENT OF PLANNING & COMMUNITY DEVELOPMENT

Project: WERRIBEE EMPLOYMENT DISTRICT

Location: WERRIBEE, VICTORIA

Drawing Title: **ZONE 3 POINT COOK NEIGHBOURHOODS**

Drawn	Date
CGT	25.06.10

Project - Drawing No.	Figure No.	Rev.
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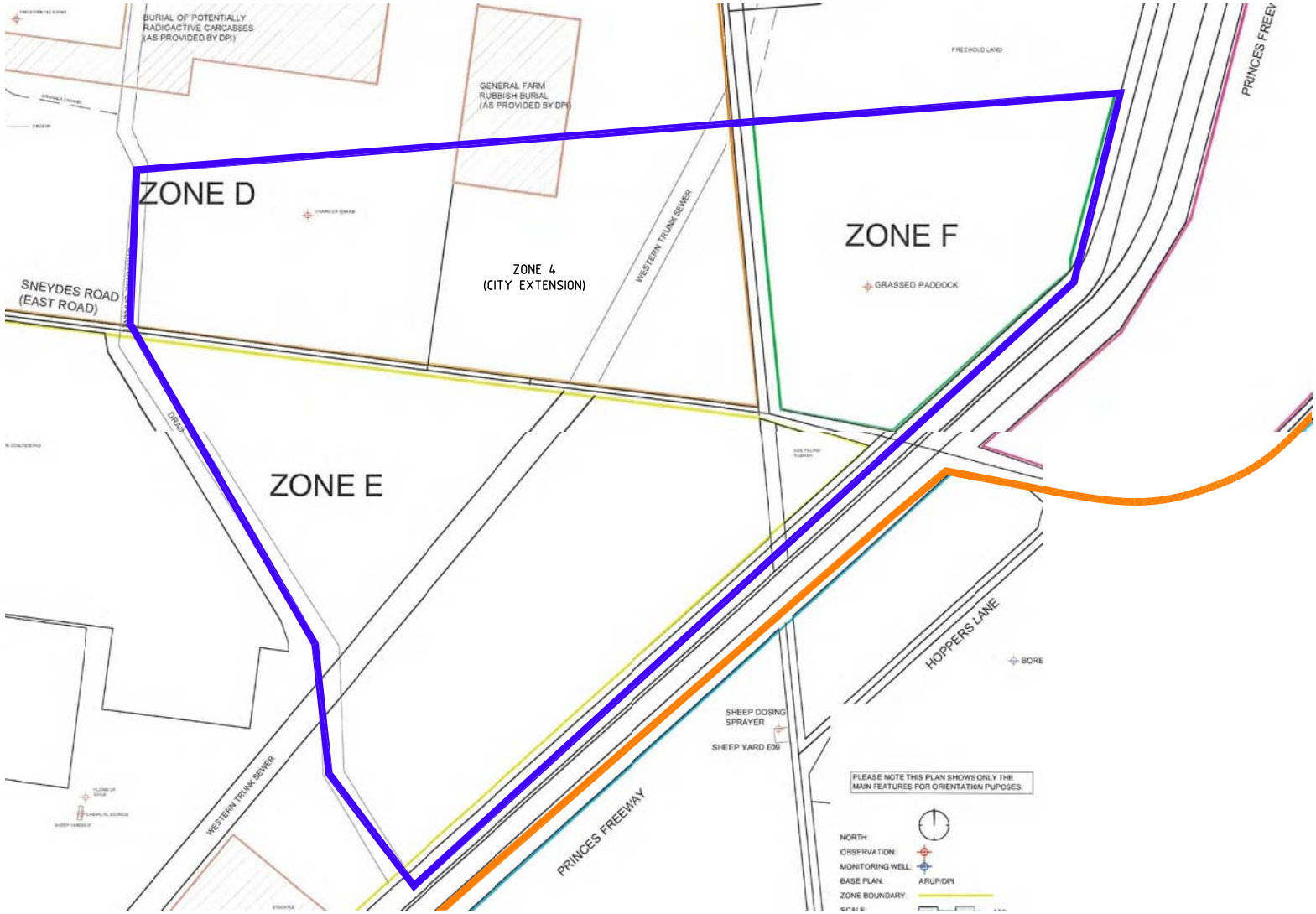

LEGEND

ZONE BOUNDARY

IMAGE SOURCE: COMPASS ENVIRONMENTAL, WEP Contamination Report, Figures 1-7, 17 March 2009

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Rev	Date	Revision Details	Drn
A	25.06.10	ZONING ISSUE	CGT

Client: DEPARTMENT OF PLANNING & COMMUNITY DEVELOPMENT

Project: WERRIBEE EMPLOYMENT DISTRICT

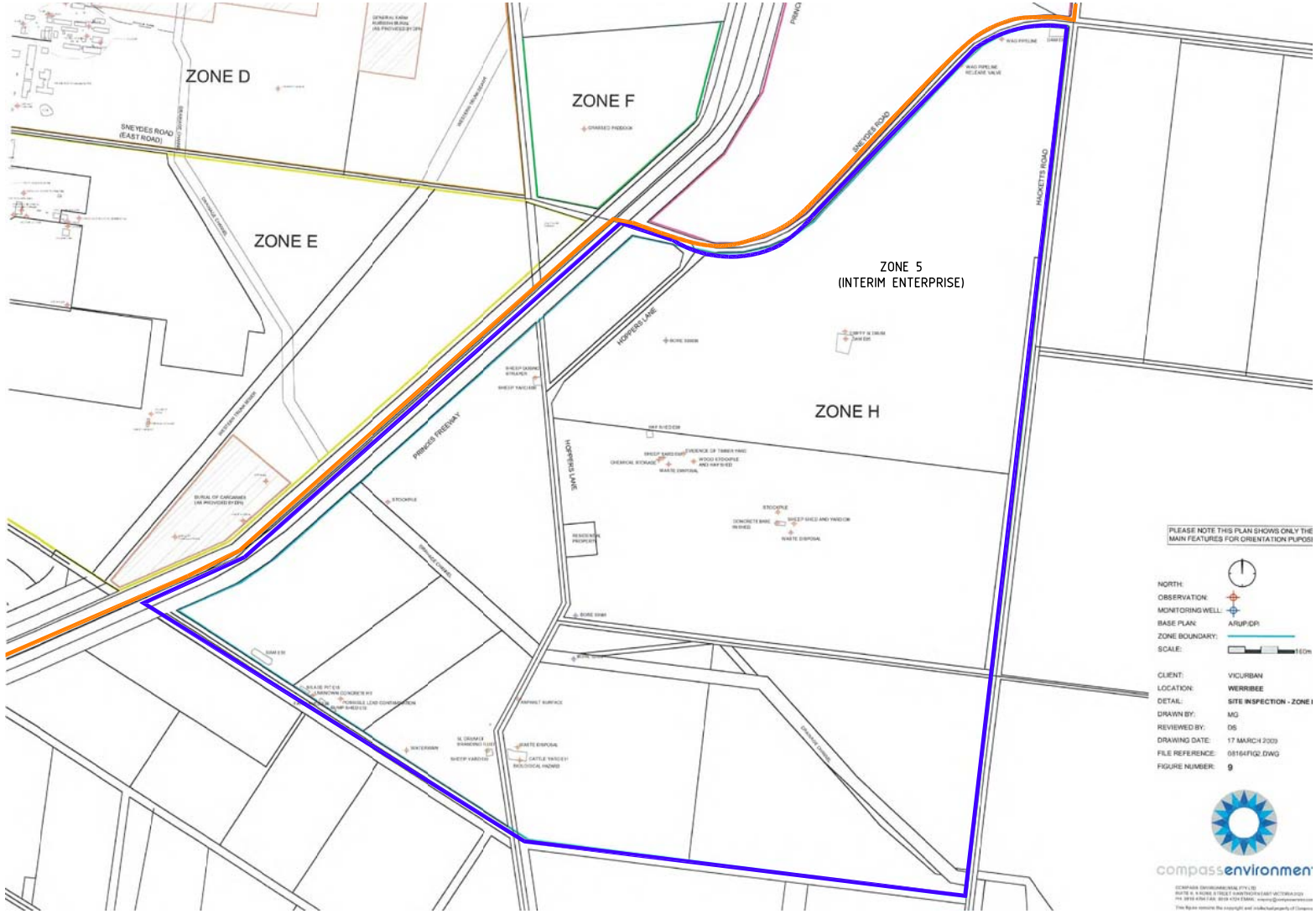
Location: WERRIBEE, VICTORIA

Drawing Title: **ZONE 4 CITY EXTENSION**

Drawn	Date
CGT	25.06.10

Project - Drawing No.	Figure No.	Rev.
ENVIABTF09574AA-D02	6	A

A4



LEGEND

- ZONE BOUNDARY
- WAG PIPELINE

IMAGE SOURCE: COMPASS ENVIRONMENTAL, WEP Contamination Report, Figure 9, 17 March 2009

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Client: DEPARTMENT OF PLANNING & COMMUNITY DEVELOPMENT

Project: WERRIBEE EMPLOYMENT DISTRICT

Location: WERRIBEE, VICTORIA

Drawing Title: **ZONE 5 INTERIM ENTERPRISE**

Drawn	Date
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